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Study on Economic Assessment for Improving eAccessibility Services and Products

FINAL REPORT

**Technosite - ONCE Foundation - Spain**

**Tech4i2 – United Kingdom**

**AbilityNet – United Kingdom**

**NOVA - Norwegian Social Research - Norway**

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“Study on Economic Assessment for Improving eAccessibility Services and Products” is a Study led by Technosite in partnership with Tech4i2, AbilityNet and NOVA, in collaboration with The Blanck Group.

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Table 1: List of acronyms and abbreviations

| **Acronym / Abbreviation** | **Description** |
| --- | --- |
| ADSL | Asymmetric Digital Subscriber Line |
| AT | Assistive Technology |
| ATAG | Authoring Tools Accessibility Guidelines |
| ATAG | Authoring Tools Accessibility Guidelines |
| ATM | Automated Teller Machine (typically banks) |
| BCT | Business Case Tool |
| CEN | European Committee for Standardisation |
| CENELEC | European Committee for Electrotechnical Standardisation |
| CLD | Causal Loop Diagram |
| CMS | Content Management System |
| CNIPA | Centro Nazionale per l’Informatica nella Pubblica Amministrazione |
| CS | Case Studies (0072 activity and output reported in Deliverable D3) |
| CSR | Corporate Social Responsibility |
| CSS | Cascading Style Sheets |
| CVAA | Twenty-first Century Communications and Video Accessibility Act of 2010 |
| DALY | Disability Adjusted Life Year |
| DFA | Design For All |
| DG | Directorate General |
| DG EMPL | Directorate General for Employment and Social Affairs |
| DG ENTR | Directorate General for Enterprise and Industry |
| DG INFSO | Directorate General Information Society and Media |
| DG SANCO | Directorate General for Health and Consumer Affairs |
| DPO | Disabled People’s Organisation |
| DTV | Digital Television |
| EC | European Commission |
| ECHP | European Community Households Panel |
| ECN | European Council |
| ESOs | European Standardisation Organisations (CEN, CENELEC & ETSI) |
| ETSI | European Telecommunications Standards Institute |
| EU | European Union |
| EU-SILC | [[1]](#footnote-1)Survey on EU Statistics on Income and Living Conditions (EU-SILC)[[2]](#footnote-2) |
| FCC | Federal Communications Commission (United States) |
| FLE | Field Level Evidence |
| FLEQ | Field Level Evidence Questionnaire (methodological tool for FLE) |
| GDP | Gross Domestic Product |
| HTML | Hyper Text Markup Language |
| ICT | Information and Communications Technology |
| IDI | ICT Development Index |
| IeA | Improved/increased eAccessibility |
| IWA | Improved/increased Web Accessibility |
| KA | Key Aspects |
| LFS | Labour Force Survey |
| LSHPD | Long Standing Health Problems or Disability |
| MeAC1 | Measuring progress of eAccessibility in Europe Study |
| MeAC2 | Study on Monitoring eAccessibility |
| MEHM | Minimum European Health Module |
| MWBP | Mobile Web Best Practices |
| NCCC | Americorps National Civilian Community Corps |
| NFB | National Federation of the Blind (United States) |
| NOVA | Norwegian Social Research |
| NPRM | Notice of Proposed Rule Making |
| NRI | Networked Readiness Index |
| PDA | Personal Digital Assistant |
| PDF | Portable Document Format |
| PQ | Policy Questionnaire (used in MeAC2, 2010 and 2011) |
| PwD | People with Disabilities |
| QALY | Quality Adjusted Life Year |
| SME | Small and Medium Enterprises |
| SST | Self-Service Terminals |
| TQ | Technical Questionnaire (used in MeAC2, 2010 and 2011) |
| UAAG | User Agent Accessibility Guidelines |
| UD | Universal Design |
| W3C | World Wide Web Consortium |
| WA | Web Accessibility |
| WCAG | Web Content Accessibility Guidelines |

Executive summary

The main focus of the study “Economic Assessment for Improving eAccessibility Services and Products” was the analysis of the benefits and costs from improved eAccessibility for society as a whole and for the organisations providing ICT based services (private companies, public administrations NGOs).

Predominant focus on Web Accessibility (WA)

On the user side the target of potential beneficiaries considered includes persons with disabilities and older persons with age-related functional limitations.

The study has looked at the issue in the most comprehensive possible fashion considering both tangible and intangible benefits. The perspective has been from a society- and an economy point of view.

We provide the first empirically grounded analysis of the extra costs that organisations must bear to make their website accessible, this means net of other ICT costs they would incur anyway.

The work carried out and the outputs produced span across a wide range of aspects and included:

* + A **scientifically robust methodological** design linking together theory, empirical evidence, practical tools, quantitative extrapolations, and policy implications;
  + **Causal models** of eAccessibility impacts;
  + Causal hypotheses operationalised into a comprehensive list of **key aspects** (costs and benefits)

Empirical field work including:

* + - **Field Level Evidence** (FLE) gathered through a questionnaire for private and public sector organisations and a questionnaire for web consultancies,
    - 24 in-depth **cases studies** with private and public sector organisations in different countries,
  + The elaboration of a **Business Case Tool** (BCT Micro) that practitioners can use in the future to quantify ex ante the costs of their investments into Web Accessibility and provide guidelines as to which benefit can be considered,

Quantitative macro extrapolation of costs and benefits at EU27 level under scenarios of Improved Web Accessibility (IWA), using the BCT Macro,

Policy implications and concrete recommendations mapped onto the evidence on costs and benefits.

In doing so we have produced important new evidence and also carefully re-used scattered facts to better inform the policy debate on eAccessibility. We have also produced useful tools, reached a number of policy-relevant conclusions with five concrete policy recommendations, and identified areas where further research and evidence is needed.

Evidence

* The level of eAccessibility is clearly lagging behind the target set out in the Riga declaration[[3]](#footnote-3) in 2006 and at its current pace the target of the Digital Agenda for 2015 will not be reached;
* As many as 110 million[[4]](#footnote-4) Europeans, persons with disabilities and older persons (people aged 65 and above), are at risks of being digitally excluded;

Data from the 2002 Labour Force Survey ad hoc module show that persons with disabilities are already on average at a clear disadvantage in terms of employment status and income, educational level. The lack of eAccessibility is further exacerbating this condition;

Persons with disabilities and older persons with functional limitation are foregoing many of the potential benefits deriving from ICT;

We estimated that, under full implementation of WA and coordination with other social policies, benefits for the users (the measure of aggregate social gain) in EU27 can reach up to the sizeable sum of €411.5 billion;

When users’ benefits are summed up to those potentially accruing to organisations in terms of increased online sales and of efficiency gains the total aggregate benefits can reach up to €413 billion;

While the aggregate EU27 organisational costs of introducing web accessibility for both private and public sector are in the order of €2.39 billion (initial and first year, they are offset by the benefits;

* At aggregate EU27 level the net benefit only for organisations remain negative under most scenarios[[5]](#footnote-5), although such aggregate calculations should be seen in relative terms: such costs would amount only to 6% of total administration ICT spending and to 16.2% of total private sector ICT spending (See Section 9.2);

The organisations surveyed through a questionnaire or analysed with in depth case studies reported overall satisfaction with their efforts to introduce web accessibility, and they did not encounter main complexities and difficulties. They deemed the costs to be affordable.

In more general terms and in relation to the policy implications, the evidence on costs and benefits of Web Accessibility suggest that there is a very strong rationale for introducing Web Accessibility legislation on the grounds of equality/anti-discrimination, as demonstrated by the large size of the potential benefits for people with disabilities from web accessibility, which reflect the dis-benefits that they currently experience because of a lack of web accessibility. On the other hand, the potentially negative costs/benefit ratio for organisations in certain sectors indicates that strong policy measures are needed, for organisations left to their current decision making process are not likely to adopt Web Accessibility on a large scale. Strong support to the rationale for introducing web accessibility legislation, as:

Negative aggregate cost-benefits for EU public administration sector and for the private sector suggest that several possible policy measures are needed (both obligations and incentives), which could be justified by scale of the societal level benefits that can be achieved from web accessibility;

On one hand, the large size of the potential market for web accessibility consultancy services as calculated in this study suggests that internal market issues in this sector may justify further attention in the development of EU policy in this field. However, there are possible tensions that may need to be taken into account in this regard; for example, between policy objectives aiming to keep public administration web accessibility costs down whilst also seeking to stimulate the European market for web accessibility services. Other EU efforts in the field of public procurement of innovation might provide helpful insights for policy in the web accessibility field in this regard.

The internal market rationale is important but also complex. Comprehensive policy measures could clearly tear down market barriers and fragmentation and reduce the costs of web accessibility (competitive internal market for accessible ICT products and services), but some short-term extra costs on public and private organisations may be added.

Analytical theoretical and practical tools

The causal model developed, on the basis of the most extensive and updated review of the relevant literature to date, have identified a large number of causal relations as to the potential impact of Web Accessibility that future analysts and researchers may improve and re-use for their purposes;

From this model we extracted about 30 operationalised key aspects (costs-benefits items) for future re-use by practitioners, researchers, and policy analysts;

We produced the first empirically grounded estimation of the extra costs attributable solely to Web Accessibility and embedded this into an interactive excel based Business Case Tool that web owners can use in the future to assess ex ante or ex post their web accessibility activities and investments.

Direction for further research and evidence building

There is a clear need for measuring the level and purpose of Internet usage for persons with disabilities in EU27. In our study we had to rely only on a mere aggregate EU15 figure from a Eurobarometer report dating back to 2002;

More research is needed to discover sector differences on benefits from web accessibility. The focus should not be on producing an EU27 aggregate figure (which is impossible at a granular level in terms of sectors), but rather to have parameters from different sectors and sizes in different countries. We have attempted this but great difficulties in getting detailed enough data on the side of organisations prevented us from achieving it. For future work it is recommended that a group of analysts spend some time at the location of each selected organisation in order to build the evidence together with its representatives;

The same more in-depth analysis at organisational level by size, sector, and country is needed for the costs of web accessibility;

It would also be the source of new insights to conduct well-designed and in-depth ex ante and ex post impact evaluations under well-defined, specific, and controlled conditions. For instance, select a number of comparable organisations in comparable, local settings that are about to implement web accessibility and gather all relevant data ex ante (before the web accessibility intervention) and while the intervention is carried out, as well as ex post when the intervention is operational. The gathering of such data should concern both the organisations and their respective target audience. The careful selection of the different organisations (in terms of size and sector) and of different localities (in terms of population structure, socio-economic conditions, prevalence of disability) would enable to determine whether Web Accessibility had an impact and to quantify it;

Impact evaluation and data gathering on costs and benefits should be made a requirement and embedded in future horizon 2020 projects and CIP Pilots focussing on eAccessibility;

Studies or research should look into the more consolidated and established field of Health Technology Evaluation and explore the mainstreaming of techniques such as the measurement of Quality Adjusted Life Years (QALY), which we piloted in this study for the first time, in the field of eAccessibility.

Policy recommendations

* Binding and/or hard measures
  + **Propose a legally binding measure: Directive specifically on web accessibility**

**Rationale**: This is option 3 of the Commission’s Roadmap[[6]](#footnote-6) ("Web accessibility Action Plan" See section 8.1), and is evidently preferred to Option 1 and 2, in view of the facts that: a) only some strong obligatory measures have been shown to be effective in furthering the deployment of web accessibility; b) it is unlikely that organisations will implement WA spontaneously given the evidence and the economic reasoning we have produced; c) a strong and coordinated approach can create an internal market of accessible ICT products and services and lower the costs of accessibility; d) the costs imposed by this measure will be more than compensated by the benefits to individuals with disabilities (strong equality/anti-discrimination rationale) and by gains in terms of internal market. It is the best case of imposing private costs to achieve larger public and social benefits.

* + **Preliminary discussions with Member States on the issue of direct financial incentives and subsequently issue a White Paper or Recommendation on the topic**

**Rationale**: Incentives conditional on investments into web accessibility can change the negative costs/benefit ratio perceived by organisations and further stimulate deployment of Web Accessibility. Their costs can be compensated by the earlier mentioned benefits for individuals with disabilities, as well as the market boost for accessible ICT products and services that will generate additional tax revenues.

* Accompanying softer measures

The common rationale for all the recommendations listed below is that accompanying support measures are also important. The evidence suggests that best results are achieved where a combination of strong legislative provisions and accompanying measures such as certification and monitoring are in place. Therefore, if an EU legislative approach is implemented it might be appropriate to encourage both legislative measures in the Member States and also accompanying measures to reinforce the impacts of such legislation.

* + **Propose a recommendation on Procurement Incentives**

**Rationale**: An alternative and more promising way of changing the structure of incentives, although limited to the public procurement process, is exemplified by ain initiative adopted in the Spanish action plan for the Information Society “Plan Avanza”. Plan Avanza's tender specifications state that part of 20% of total eligibility criteria would be given to those participants whose websites were accessible (see page 132). This is an interesting way of creating an incentive that ties potential revenues to web accessibility.

* + **Push conformance assessment/certification/labelling to reinforce peer pressure also mainstreaming eAccessibility as part of CSR frameworks, by for instance:**
  1. DG INFSO collaborating with DG SANCO, DG EMPL, and DG ENTR on the issuance of a white paper or communication calling for the mainstreaming of eAccessibility as one of the key components of Corporate Social Responsibility in the EU27;
  2. Establish, possibly in collaboration with some of the other DGs mentioned above, a EU27 Web Accessibility ‘two thick accreditation schemes’ (along the lines of the UK practice) and a related and widely market Awards programme;
  3. Call the Member States to link such accreditation schemes with additional funding (as a sort of prize) to public sector organisations achieving excellence;
  4. Issue, in collaboration with some of the other DGs mentioned above, a European ‘Code of Conduct’ for the treatment of eAccessibility issues within private and public sector organisations.

**Rationale**: Peer pressure and social influence are part of the drive that can lead organisations to adopt Web Accessibility. We found encouraging evidence that many organisations already perceive Web Accessibility as a positive contribution of their social image and as part of their Corporate Social Responsibility (CSR), which should be leveraged. Aggregate EU monitoring through benchmarking is important and should be continued, but it is not sufficient. Up until now, Web Accessibility has not been mainstreamed as a component of CSR, while certification and other conformance solutions are not very widespread across EU27.

* + **Launch awareness raising, champions, and capacity building measures such as:**

1. Dissemination of the main findings of this and other relevant studies through ePractice and other channels. In particular, disseminate the most interesting case studies (showing results, satisfaction, that the introduction of Web Accessibility is not complex and is compatible with organisations’ value, practices, and stakeholder base);
2. Create self-standing and ad hoc Web Accessibility Awards (on the model of the eGovernment Awards celebrated at each ministerial conference);
3. Use various channels to spread among SME and public sector organisations the capacity for producing ex ante evaluation, subsequent monitoring, and ex post analysis of the costs and benefits of eAccessibility. This can be done, for instance, by: funding benchlearning pilot studies for involving several organisations engaged into a collaborative process of application of the Business Case Tool produced by this study; making the usage of the Business Case tool (or of any other equivalent too) mandatory for all framework programme projects and CIP pilot funded in the domain of eAccessibility; extracting from the Business Case Tool a short checklist on ePractice to be put online and request all case owners in the field of eAccessibility to use it.

**Rationale**: We observed little awareness and measurement capacities among organisations for what concerns costs/benefits of Web Accessibility, yet having evidence both from other cases and generated internally, awareness and measurement capacities are fundamental to drive and sustain Web Accessibility. We have also noticed that many organisations are satisfied with their own investments into Web Accessibility and did not encounter dire complexities and difficulties, which should be made known to other organisations to demystify the idea that introducing Web Accessibility is complex and extremely difficult. In addition to this, supporting Champions campaign can trigger the process of social influence through networks and processes of imitation.

1. Premise

This is the final report of the study “Economic Assessment for Improving eAccessibility Services and Products”.

The main focus of the study was the analysis of the benefits and costs from improved eAccessibility for society as a whole and for the organisations providing ICT-based services (private companies, public administrations NGOs). The predominant focus has been on Web Accessibility (WA).

On the user side, the target of potential beneficiaries considered includes persons with disabilities and older persons with age-related functional limitations. The study has looked at the issue in the most comprehensive possible fashion considering both tangible and intangible benefits. The perspective has been from a societal and an economic point of view. We provide the first empirically grounded analysis of the extra costs that organisations must bear to make their website accessible, this means net of other ICT costs they would incur anyway. The work carried out and the outputs produced span across a wide range of aspects, including:

* A scientifically robust methodological design linking together theory, empirical evidence, practical tools, quantitative extrapolations, and policy implications;

Causal models of eAccessibility impacts;

Causal hypotheses operationalised into a comprehensive list of key aspects (costs and benefits);

* Empirical field work including:

Field Level Evidence (FLE) gathered through a questionnaire for private and public sector organisations and a questionnaire for web consultancies;

24 in-depth cases studies with private and public sector organisations in different countries;

The elaboration of a Business Case Tool (BCT) that practitioners can use to quantify ex ante the costs of their investments into Web Accessibility and provide guidelines as to which benefit can be considered;

* Quantitative macro extrapolation of costs and benefits at EU27 level under scenarios of Improved Web Accessibility (IWA);

Policy implications and general suggestions on how to use evidence on costs and benefits to further develop measures to stimulate eAccessibility deployment in EU27.

Although much still remains to be done to fully understand the costs and benefits of eAccessibility and to raise awareness on the potential benefits and on the fact that the extra costs exist but are limited, this study has started to fill the evidence gaps. It contributes to fact-based discussions of future policies. It also sets the lines that future research in this domain should follow to further improve the evidence base.

The sheer size of the outputs produced is such that for the sake of readability we present and comment only the main findings and analyses in the main body of the report, whereas we have included methodological technicalities and more in-depth presentation of empirical findings into six annexes. To maintain a manageable size of this report even these annexes could not contain all of the material the study produced. So, the interested reader can download all of the output produced (including for instance questionnaires used and a selection of case studies) at <http://www.eaccessibility-impacts.eu/>

1. Scope, Methodology and Contents
   1. Scope: predominant focus on Web Accessibility

The study focuses mostly on Web accessibility, but addresses also in a more limited fashion Digital TV (DTV) and ATMs Self Service Terminals (SST). As the evidence base on costs and benefits for DTV and SST are considerably weaker than for Web Accessibility, the empirical field level work (Field Level Evidence, FLE, and Case Studies, CS) the Business Case Tool (BCT Micro), and the quantitative projections concern only Web Accessibility. For this reasons we present the evidence on DTV and SST in Annex 3.1 and we do not venture into deriving any policy implications for these two technologies. A second and more important delimitation of the scope of our analysis is provided visually in Figure 1, as we moved from the gathering of empirical evidence to the framing of the causal model and the extraction of key aspects, to the BCTs, and to the quantitative projections the focus became narrower but also deeper (though this could not be rendered graphically). Methodological and feasibility constraints explain this gradual restriction in the scope[[7]](#footnote-7). As a result, for Web Accessibility we have identified a total of 32 key aspects that can be broken down as follows:

* 16 user level benefits, of which:

6 suitable for monetary measurement;

4 suitable for quantitative measurement in volume but not in monetary terms;

6 qualitative (i.e. increase in self-esteem);

* 16 for organisational level costs and benefits:

8 suitable for monetary measurement;

4 suitable for quantitative measurement in volume but not in monetary terms;

4 qualitative (i.e. improved social image).

Next, when moving to generate the aggregate EU27 quantitative projections of costs and benefits from IWA, we only quantified 8 (due to lack of data, see Section 7) out of the total of 32 and more specifically of the 14 deemed suitable for a monetary measurement. This choice was shaped by methodological requirements and data challenges[[8]](#footnote-8).

Figure 1: Scope of analysis

Source: Study Consortium’s elaboration

* 1. Methodological design and disclaimers

We have adopted an articulated and sophisticated research design and used a very large number of sources. Whereas the full-blown description of the methodology can be found in Annex 2.1 below we give a brief summary of the parameters and choices that we consider important to enable the reader to correctly interpret our findings and analyses, also in light of their limitations. We have designed the study following the steps derived from the scientific literature on impact evaluation.

Firstly, we formulated a counterfactual causal model of what can happen in terms of broadly defined impacts (including areas of user level benefits and of organisational level benefits and costs) under the assumption of increased adoption of eAccessibility (***Causal Model***). Secondly, from the more general and high-level hypotheses of the causal model we extracted operationalised and measurable hypotheses in the form of ***Key Aspects***. Thirdly, with the main causal hypotheses in mind, we looked at the availability of data to identify those key aspects that are more feasible to be measured and then selected the appropriate method for micro level and macro level measurement. Fourthly, the empirical evidence from secondary sources (wide ranging desk research) was reinforced with additional evidence constructed through field-work (Field Level Evidence, FLE, and Case Studies). This additional evidence was used both to reinforce steps 1 and 2 and to produce empirical parameters and test for step 5. Step 5 comprises the more analytical part of our work where all the previous input was processed to produce two related but different outputs[[9]](#footnote-9):

* a micro level measurement tool (BCT Micro) intended to support organisations to build their business case when deciding their investments in eAccessibility;
* the aggregate EU27 quantitative projections in monetary values of 7 key aspects (including user level benefits, organisational level benefits, and organisational level costs).

The final step consisted in extracting policy implications from the findings.

Having illustrated the overall logic, we want to point out some limitations related to lack of availability of information and data. Some simplifying assumptions and choices were therefore made in the macro level quantitative projections. These disclaimers contribute to contextualise our results, to *indicate gaps that still need to be filled by future research, and also to highlight the contributions we already made*.

The limits and shortcomings can be summarised as:

* **Non-consolidated scientific literature**. In general the scientific and empirical literature on the causal impacts of eAccessibility is limited and we had to apply by analogy hypotheses and evidence from indirectly relevant fields (i.e. literature on the impact of ICT skills on the labour market or socio-economic analysis of accessibility in general);
* **Little scientific evidence on organisational costs and benefits**. In comparative terms the sources on the benefits for individuals with disabilities are more numerous and of higher quality than those on organisational level costs and benefits. Indeed for this respect it is worth quoting what is stated in one recent article on the topic: “*The issue of Web Accessibility has gained little attention in the area of economics and business so far even though its implementation especially in organisations of the private sector justifies also business and management research to be considered*” (Leitner & Strauss 2008, p. 490) and again later: “*An extensive literature research in the field of Web Accessibility revealed various technical studies about Website accessibility evaluation but very few studies on business and managerial benefits of Web Accessibility*” (Ibid, p. 493). In particular on the organisational costs of eAccessibility there are practically no reliable scientific sources and one can find controversial claims (costs being very small or very high) in institutional reports and practitioners’ generated content. In this respect our field-work enabled us to start filling this gap on costs.
* **Lack of EU27 comparable statistical datasets**. Whereas solid EU level datasets are available on the socio-economic situations of People with Disabilities -PwD- (see Annex 1.1) they cannot be matched with EU27 statistics on PwD level of digital inclusion, usage of the Internet for different purposes etc. All we know at EU aggregate level about PwD and the Internet is only the general percentage of those accessing the Internet in 2002 from a Eurobarometer survey. In addition there is lack of a series of other data that would be needed for treating the topic of eAccessibility impacts through the application of formal quantitative statistics and econometrics techniques (See Annex 2.1, §2.4)

As a result, for the quantitative macro level projections we had to follow a theory and empirically informed approach. This, however, without the possibility of applying formal quantitative methods that would have enabled us to control for intervening variables and to stochastically test our causal hypotheses on the impacts of increased Web Accessibility. Theory and empirical evidence was used to remedy this limit by formulating some assumptions about impact (see details in Annex §5.1). In particular we want to stress that we attempted to render the uncertainties of impacts by fixing, for each of the quantified benefits, some scenarios based hypotheses about[[10]](#footnote-10): a) the effectiveness of the policy efforts for increasing Web Accessibility (actual adoption and enforcement); b) the chances that such efforts actually reach all the potential target (PwD and elderly persons) or only some fractions of it. As the reader can see in Section 7, these scenarios produce a large variability in the size of the potential benefits. The variability introduced through scenarios reflect the fact that: a) policy can either be a success or a total failure depending on many factors; b) the effects of Improved Web Accessibility (IWA) may depend also on other variables (i.e. education). The lower bound / lower reach parameters, for instance, may reflect the fact that IWA per se could produce only a part of the total potential benefits. In brief the scenarios try to account for unobservable factors such as:

* **Intensity and pervasiveness of police effort**: extent to which policy change is actually implemented and with what level of enforcement (i.e. directive only or directive that can be really enforced);
* **Additional intervening factors**: even the most intense policy effort may not produce effects if large parts of PwD are not aware about the benefits of using Internet, or do not have other important complementary skills obtained from formal education.

We have chosen this approach to render such uncertainty and to transparently give any reader the opportunity to freely judge and assess which of the scenarios seem more reasonable to him/her.

* 1. Explanation of contents

In this report we provide a compact and readable synthesis of the outputs produced, preserving the logical coherence while avoiding duplications and unnecessary technical details. The reader can find all the relevant information in this report, and does not need to look at others deliverables to reconstruct the logic used to reach the findings. Lengthier and more technical illustrations are to be found in the six annexes.

In the next **Section** 3, we present the eAccessibility challenge (§3.1) as well as the main objectives and outputs of this study (§3.2).

**Section 5** after placing the issue of eAccessibility in a broader context of digital and social inclusion (§4.1) presents a causal model of impacts (§4.2), and the key aspects identified in a very synthetic fashion with selective illustrations in 14 boxes (§0). The specific causal models for DTV and SST and the illustration of all key aspects in details are reported in Annex 3.1.

***Section*** 5*presents the main findings of the questionnaire to organisations (§5.1), those of the case studies (§5.2), and those of the questionnaire to web consultancies on the costs of Web Accessibility (§6.3). Additional background material on empirical field work is available in Annex 4.1.*

The Business Case Tool Micro is an interactive excel tool available for download (<http://www.eaccessibility-impacts.eu/>), which we briefly illustrate in **Section** 6**.**

In the quantitative projections of costs and benefits presented in **Section 7**, we first provide a very compact snapshot of the quantified projections item by item (§7.1), then the aggregate comparison of costs and benefits (§7.2), and comment the results from the perspective of the economics of innovation (§7.3). The calculation procedures, as well as the sources used, are fully detailed in Annex 5.1.

In **Section** 8, we shortly discuss the policy implications of our findings and present some general considerations and recommendations as to possible policy measures.

References used in this Study can be found in **Section 10.**

We also recall the three annexes mentioned previously: Annex 1.1 describing the statistics used to quantify the target of potential beneficiaries, Annex 2.1 explaining the methodology used in detail, and Annex 0 aimed to give a brief introduction about web accessibility for those readers new to the accessibility topic. A substantial list of references (**Section 9**) follows the conclusions and precedes the six annexes mentioned.

1. Introduction
   1. The challenge: the need for social innovation

**eAccessibility** concerns the design of Information and Communication Technology (ICT) products and services- People with disabilities (PwD), but also e.g. elderly people with reduced functional capacities should be able to use those products and services on an equal basis with any other person (European Commission, 2007) by removing the barriers to access (European Commission, 2010). eAccessibility includes several ICT-based delivery channels and new media such as the Internet, Digital Television (DTV), Self-Service Terminals (SST), and many others. **Web Accessibility** refers to the practice of designing and editing websites in such a way that all users can have equal access to information and functionality. **Web Accessibility** is primarily targeted at Persons with Disabilities but can benefit many other social and/or situational groups (i.e. older people, recent immigrants, individuals with limited technical means of access to the Internet, individuals on the move using mobile devices).

* + 1. Lack of eAccessibility is a barrier for 100 million Europeans

Today, accessibility to information and communication technology (ICT) is indispensable for people to participate fully in the economy and the society and to exercise their freedom of choice and to have an independent living. Individuals increasingly appropriate such technologies and incorporate them in their daily practice in a variety of ways (ITU 2007; Dutta and Mia, eds, 2009): technology has furthered new forms of social interaction, new business activities, change in education and employment and occupation requirements. Intensity and quality of use of ICT products and services play a crucial role in helping individuals position themselves within the current socio-economic context, where the competition for being included, not only in terms of jobs but also of social relations, and of informed participation in public debate, is increasingly being pushed at an individual level. Therefore, being digitally excluded is a source of social inequality as it can result in exclusion from relevant networks and social relations, jobs and leisure opportunities, as well as from informed participation in public debate. Digital exclusion is the paradigmatic form of social exclusion in this new social order (Codagnone, ed., 2009: 5-6). The expanding use of ICT may create new opportunities for people with disabilities in areas such as education and employment, and may reduce barriers to participation in everyday life: if barriers are removed (i.e. eAccessibility improved) the use of ICT can contribute to social inclusion. This includes i.e. better access to health and public services, improved employability and productivity, increased embeddedness in social relations and networks, and so on. Conversely, the lack of eAccessibility can further compound already existing forms of social exclusion.

The datasets of statistics used for this study (see Annex 1.1) clearly show that PwD as a group have lower educational-, employment-, and wage levels if compared to persons without disabilities (in the same age groups). These socio-economic gaps are to a large extent the results of limitations and barriers in the human-made environment. Following the World Health Organisation International Classification of Functioning, Disability and Health (ICF- May 2001),disability cannot be considered only as an attribute of individuals, but rather as a complex social and environmental construction shaped by societal attitudes and the limitations of the human-made environment. Attitudes and human-made environments compound the difficulties deriving from disabilities. Websites, Self-Service Terminals (SST, i.e. bank machines), Digital Television (DTV), if not accessible to PwD and/or to elderly people with different impairments (visual, hearing, speech, dexterity, cognitive) are just another source of human-made environmental limitations and barriers.

The UN Convention on the Rights of Persons with Disabilities, adopted in 2006, marks the first time accessibility is mentioned in an international human rights instrument, and it is defined within the Convention in a highly comprehensive manner. As the UN Convention has several explicit references to ICT, as well as more general and generic provisions of importance for ICT-based goods and services, it has had and will have implications for the EU eInclusion policy. Since the mid-1990s, the European Union has developed a pro-active and ambitious policy to address issues related to disabilities (Timmers 2008), focusing especially on non-discrimination regulations and prevention of disabling barriers to participation, especially after the adoption of Article 13 of the Amsterdam Treaty. This article prohibits, among other aspects, discrimination on grounds of disability, and includes the adoption of the non-binding declaration on the needs of persons with disabilities in the internal market attached to Article 95 EC. This new stance of the Commission took also the forms of several policy initiatives and measures pertaining specifically to the eAccessibility.

Yet, ensuring full accessibility of ICT products and services is not a simple issue due to the complexity and fragmentation of the eAccessibility ‘value chain’ and to regulatory frameworks based on different principles mainly applicable at the national level. For these reasons policy makers still face unsolved issues of policy design and implementation to promote eAccessibility. The legal framework and supporting policy measures are in flux in many countries throughout the world. Today, the results of the 2011 edition of the “Study on Monitoring eAccessibility “, hereinafter referred as MeAC2, show that the Riga targets set in 2006 are still at far reach, as shown in Figure 2 below.

Figure 2: Relationship between the eAccessibility level in policy and technology (2011)

Descripción: The relationship between the eAccessibility level in policy and technology shows that the treadline between the status of eAccessibility and the level of eAccessibility policy implementation are positively correlated. 

Source: MeAC2 (2011) data. All countries.

Unfortunately, there is a lack of EU27 comparable statistics to measure the level of digital inclusion / exclusion of PwD and elderly persons with functional impairments. Eurostat information society statistics tells us that as of 2010 regular Internet usage among the elderly is at 15% whereas in the adult population at large it has reached 70%. The only data available for PwD is from a 2002 Eurobarometer survey on EU15 showing that the gap in access and usage between PwD and the rest of the population was substantial: whereas 43% of the households accessed the Internet from home, only 25% of those with a Long Standing Health Problem or Disability (LSHPD) accessed the internet. For those who besides reporting a LSHPD also affirmed to be considerably hampered by it in their daily activities the number was 13 %. (Eurobarometer 2002: p.9). There is no new source to assess if the gap of PwD has been reduced or increased since 2002. Nonetheless, judging from the benchmark of the level of Web Accessibility measured in 2011, we can at best expect the gap to have remained constant. Hence, we can safely conclude that lack of eAccessibility is compounding other exclusionary processes and that it is a policy challenge of social inclusion of PwD and elderly persons.

The next question is how big is this challenge - how many are affected and what is the potential reach of the achievable benefits if the barriers where effectively removed?[[11]](#footnote-11) Using the Labour Force Survey ad hoc module of 2002 and projecting the results to the current population we found that:

* 45 million individuals reporting being moderately or considerably restricted in their Activity of Daily Living (ADL) due to a LSHPD - this include 11.7 million in the age group 65 and above and 33.4 million in the age group 16-64;
* An additional 64.9 million individuals aged 65 and above are not restricted by any LSHPD, but are potentially affected in the future due to their age;

So, if we add to PwD also the elderly population not restricted by any LSHPD we are looking at a more widely defined potential target of 110 million Europeans, or one fifth of total population. As shown by various authors (See for instance Hanson 2001; Heerdt & Straus 2004), this larger definition of the target is justified by the fact that the potential beneficiaries of eAccessibility in general and of Web accessibility in particular, are not only the strictly defined people with disabilities, but can also include the ageing population[[12]](#footnote-12).

* + 1. A barrier to the internal market and foregone business opportunities

As evidenced in a previous EU funded study (Cullen et al 2008: p. 22), eAccessibility bears relevance to the principle of the internal market. The current fragmentation of the regulatory framework and the lack of eAccessibility in general, and of Web Accessibility in particular, do not ensure:

1. That barriers of access to the internal market and to free movement are minimised for users /consumers;
2. That the market potential for online cross-border services has the widest possible reach for managers of organisations with important online activities;
3. That the cross-border internal market for accessible ICT products and services function efficiently and allow to achieve economy of scale for producers of ICT goods and services, (which would results in lower costs for the organisations needing accessible ICT products and services).

These barriers limit the benefits that eAccessibility could produce for organisations and the related market opportunities. Organisations can increase their customer reach, productivity and social image by producing accessible ICT products or ICT-enabled services. The mainstreaming of accessible ICT products and services represents a potential business opportunity and new market since PwD and more broadly the elderly command a considerable spending power. If their needs were better addressed they may increase their consumption of ICT products and services, thus boosting the output of the ICT industry, which in turn is known to contribute directly to GDP growth. Naturally, implementing eAccessibility bears, at least initially, some costs. The non-scientific literature on eAccessibility and Web Accessibility is ridden with contrasting claims from interested parties particularly as to the costs of introducing Web Accessibility. Some advocates of PwD rights claim that the costs are minimal and some industry representatives affirm to the contrary that costs are sizeable and for some organisations prohibitive. To provide the first empirically grounded quantification of the extra costs for organisations attributed solely to Web Accessibility is one of the most important contributions of this report. Here, however, we want to stress that the challenge of eAccessibility costs is linked to the current regulatory fragmentation. Should the regulatory framework be streamlined, then market scale may ensure that the costs of accessible ICT product and services decrease.

* + 1. eAccessibility as a social innovation

Introducing eAccessibility and more specifically Web Accessibility can be looked at from the perspective of innovation. Actually, it is the best example of social innovations that addresses a societal challenge while at the same time creating a market and business opportunity. This approach to social innovation is taken in the new general EU2020 Strategy (European Commission 2010c) and in the Digital Agenda for Europe (European Commission 2010d). Social innovations, in these official communications, are defined as those whereby new ways of doing things are introduced to cope with societal challenges while at the same time creating new business and market opportunities. This is exactly what eAccessibility aims at, copying with the societal challenge of ensuring individuals with disabilities equal access to the potential benefits of using ICT and participating to the information society, while at the same time creating new business and market opportunities for both ICT producing and ICT using companies and organisations. So, eAccessibility is an innovation that can produce:

1. **User level benefits**. They are the benefits potentially accruing to PwD and elderly persons from increased Web Accessibility, which can be interpreted as the benefits to economy and society as a whole, or using the language of the economics of innovation the ‘social surplus’ of an innovation;
2. **Organisational level benefits**. They are the benefits potentially accruing to the private firms and to the public organisations that introduce Web Accessibility (for instance increased reach and sales, reduced transaction costs from channel switch, etc.). Using the language of the economics of innovation these are the source of the marginal returns from innovation;

And naturally we have the costs:

1. **Organisational level costs.** They are the various items (set up costs, redesign costs, maintenance costs, etc.) that make up the cost private firms and public organisations must bear to introduce Web Accessibility. Using the language of the economics of innovation these are the source of the marginal costs of innovation;
   1. Objectives, contribution, and outputs of this study
      1. eAccessibility remains, above all, an issue of equal rights and civilisation…

The costs that organisations may have to bear to introduce Web Accessibility are marginal if compared to the sense of self-esteem and autonomy that being able to do things online can produce for PwD. eAccessibility is first and foremost an issue of equal rights and of legal and social obligations. A recently published legislative document from The US Department of Justice[[13]](#footnote-13) emphasises among the intangible benefits of accessibility “**option value**” and “**existence value**”. Option value is the value that people with and without disabilities derives from the option of using accessible facilities at some point in the future. As with insurance, people derive benefit from the knowledge that the option to use the accessible facility exists, even if it ultimately goes unused. Existence value is the benefit that individuals get from the plain existence of a good, service or resource, in this case, accessibility. It can also be described as the value that people both with and without disabilities derive from the guarantees of equal treatment and non-discrimination that are accorded through the provision of accessible facilities.

* + 1. Evidence on costs and benefits can help raise awareness

It is evident that more information on measurable costs and benefits may be of strategic importance to support the further development and introduction of accessible ICT product and services. In 2008 Cullen et al (2008: p 22) identified lack of awareness about benefits among the main causes of limited level of eAccessibility in Europe. Indeed the tender specifications for this study made this aspect very clear:

“*Insufficient evidence and lack of sound estimations on the costs and benefits of implementing e-accessibility can lead policy makers, market players and public authorities to resist or hesitate to take further action. This study currently calls for focus on costs and benefits of e-accessibility and should provide the different stakeholders with information that can contribute to improve the e-accessibility situation*” (p. 1)

This passage defines the rationale, main objective and expected contribution from this study. Indeed, little attention has so far been given to eAccessibility as a potential source of societal, economic and business benefits possibly offsetting its costs. Although legal obligations and the implications of social responsibility have increased the pressure on organisations to make their websites accessible, the level of Web accessibility is still poor. Managers still require facts and figures about Web accessibility costs, benefits, savings or expenditures, as well as amortisation and financial plans, for their decision-making process. Social and legal pressures on their own are important but could certainly be reinforced by evidence on measurable costs and benefits.

The main goal of the study and the potential contribution is to provide evidence and tools in support of a more informed discussion of eAccessibility at the European level among policy-makers, ICT practitioners, and other groups of stakeholders (decision makers inside organisations), by shedding light on the relative advantages (meaning already having discounted the disadvantages) of introducing eAccessibility in terms of costs and benefits. In pursuing this general objective we have produced the following core outputs:

1. A Causal Model of all the potential impacts, from which all possible qualitative and quantitative Key Aspects (operationalised costs and benefits) have been derived;
2. A large body of Empirical Evidence comprising secondary sources and statistics, as well as primary field work through a questionnaire and a series of more in depth case studies;
3. An ex ante evaluation tool (Business Case Tool, BCT) that will help ICT practitioners and decision makers in organisations assess costs and benefits through both quantitative and qualitative metrics;
4. Quantitative Projections at EU27 aggregate level of the monetisable costs and benefits of Improved Web Accessibility (IWA) under different scenarios of adoption;
5. Policy Implications analysis with recommendations on how to use evidence on costs and benefits to further develop measures to stimulate eAccessibility deployment in EU27.
6. Causal model of impacts and key aspects
   1. eAccessibility and social/digital inclusion

The digital exclusion of PwD is not caused only by lack of eAccessibility, and increased eAccessibility per se cannot ensure that benefits can automatically accrue to users. A large role is played also by the Socio-Economic Status (SES) and by other situational factors (i.e. ‘individual functionings’ following Sen, 2000) characterising different segments with the broad pool of PwD. Individual functionings shape the extent to which PwD appropriate ICT and are capable to achieve desirable outcomes.

If the functionings are low this will reflect into low or no level of ICT appropriation and will prevent some PwD to achieve desirable benefits even if the generalised level of eAccessibility increases[[14]](#footnote-14). PwD are more likely to have characteristics that are associated with lower levels of access to, and usage of, ICT. In comparison to the rest of the population they are generally more likely to be disadvantaged socioeconomically in terms of lower income, lower employment rates or less education. Indeed, “*The linkage between poverty and disability is strong and goes in both directions. Poverty causes disability through malnutrition, poor health care and dangerous living conditions. Disability can cause poverty by preventing the full participation of people with disabilities in the economic and social life of their communities, especially if the proper supports and accommodations are not available*” (World Bank 2009). If we take PwD in aggregate they clearly stand out as socio-economically disadvantaged[[15]](#footnote-15) and digitally excluded (proxied by Internet usage), as documented in the next two boxes.

Box 1: Social conditions of PwD in the EU: selective data

* Having a LSHPD does not necessarily imply difficulties in working or undertaking normal activities – 33% report that they are not restricted in the kind or amount of work they could do or their mobility to and from work. Proportions vary considerably across countries – from under 10% in three Member States to over 50% in another three – these proportions tending to vary in some degree with the level of prosperity of countries, perhaps reflecting the extent of assistance available. Considering all of the above, 10% of all men and women aged 16-64 report that they are restricted in the kind or amount of work they can do, their mobility to and from work, or some combination of these.
* 33% of those with a long-standing health problem or disability (LSHPD) report that they are not restricted in the kind or amount of work they could do or their mobility to and from work. This means that 10% of all men and women aged 16-64 in Europe report they are restricted in the kind or amount of work they can do, their mobility to and from work, or some combination of these.
* In the EU as a whole, 63% of those aged 16-19 who were considerably restricted in their ability to work participated in education or training compared to 83% of those who were not restricted at all.
* the proportion of people of working age who are considerably restricted in their ability to work who were in employment in 2002 averaged only 28% in the EU (unadjusted figure is 24%) as compared with 68% of those not restricted.

Source: APPLICA & CESEP & ALPHAMETRICS (2007, pp. 8-18) [[16]](#footnote-16)

Box 2: Internet usage by people with disabilities: selected figures[[17]](#footnote-17)

* **EU15** (2002). According to a Eurobarometer EU15 survey (2002) only 25% of the respondents suffering from some form of disability have access to the Internet from home as compared to the general figure of 39% for the population as a whole.
* **UK** (2008). According to a Ofcom report, in the UK in 2008 the gap in Internet usage at home between individuals with disability and the average figure for the population at large remain of about 20%: among the two groups of population: 45% of people with visual impairments, 39% of people with hearing impairments and 39% of people with mobility impairments have Internet access at home, against more that 65% of those without disability.
* **Ireland** (2007). A survey conducted in 2007 found that rates of computer access and Internet usage by people with disabilities were a lot lower than the general population: just 29% of people with disabilities had a PC, laptop or both compared with 46% of the non-disabled population and that 24% of people with disabilities used the Internet compared with 48% of the general population.
* **USA** (2002-2010). 39.7% of persons with disability lived in households with computer as compared to 63.6% for the population as a whole. Similarly 33.0% of people with disability lived in households with Internet access as compared to 59.1% for the population at large. A more recent survey (2010) still indicates a gap of 31% in using a computer or other electronic device to access the Internet from home, work of other location, between the general population (85% of which use Internet) and people with disability (only 54% of which use Internet).
* **Netherlands** (2011). According to a study on the internal market for assistive ICT, using the Netherlands as a benchmark, they were able to predict the Internet usage of PwD compared to the general population over a range of X years. The study assumed that PwD internet uptake rate follows the same pattern of the S-curve of the overall population, and also that if people with disabilities are given proper tools, their Internet usage would increase. However, the study proves that PwD internet uptake will not achieve the same level as the general population per respective country, neither in terms of uptake nor time lag for achieving Netherland´s level.

Sources: For EU15 (Eurobarometer 2002); For UK (Ofcom 2008); For Ireland (Amárach Consulting 2007); For USA (NTIA 2000, 2002; Kaye 2000; Kessler Foundation/NOD 2010), For the Netherlands (Deloitte 2011)

The data from the 2002 ad hoc module of the Labour Force Survey (LFS, see Annex 1.1) tells us that among the age group 16-19 participation in secondary level education is at 85% among individuals without disabilities and at 75% among those with some restriction, and only 63% among those who are considerably restricted. A similar pattern emerges in the age interval 20-24: the percentage of those attending education is 43% among the population at large, 36% among PwD reporting minor restrictions and only 23% among those with considerable restrictions. This is a big educational gap and it should be pointed out that there is little that IWA can do to improve the labour market outcomes of these younger PwD unless complementary non-ICT policies support them to improve their participation in education.

This is one of the reasons why we made realistic hypotheses and several scenarios on how much IWA could improve the employment and/or the wage situation of PwD in our quantitative projections. Many more policy efforts other than simply making website accessible are needed to improve the educational attainment of PwD so that this increases their chances of getting a job and a good salary. These are efforts that need to be coordinated across different policy domains.

* 1. Causal model of impacts

Figure 3 illustrates the causal model for Web Accessibility. Here we will generally illustrate the logic of its structure, whereas in the following sub-paragraphs we will go into the details of the key components.

The left hand side of the figure concerns user level benefits and the right hand side organisational level costs and benefits. In addition to the core variables rendered in the blue boxes, the model considers also other two blocks of variables. The green boxes and arrows concern the issues of ICT appropriation and how they relate to social inclusion that we discussed in the previous paragraph. We placed the box of “ICT appropriation” on top of the arrows going from Web Accessibility towards both the users and the organisational broadly defined areas of impact. It means formulating the hypotheses about the causal relations between Web Accessibility and Impacts as follows: “*Provided a sufficient level of ICT appropriation among the target groups exists, we assume that increased Web Accessibility can help them achieve the various impacts considere*d”.

Figure 3: Causal model of IWA impact

Descripción: Direct primary potential web accessibility effects on the user level benefits include labour market empowerment, reduced opportunity and social costs, welfare/health empowerment, and private/social life empowerment. The demand side conditions and preconditions include individual functionings, and level of ICT appropriation among PwD. 
Direct primary potential web accessibility effects regarding organisational level costs and benefits include costs of accessibility, level of web accessibility, operational performances, labour force productivity and quality, and social image and brand. The demand side conditions and preconditions include level of ICT appropriation among employees with disabilities. The intervening supply side effects include the ICT industry dynamic and policy/regulation. 

Source: Study Consortium’s elaboration on sources cited in the text and included in the references

The red arrows on the side of the figure focusing on the user level of analysis indicate the mutually reinforcing effects (potentially positive or negative) between social and digital inclusion/exclusion. All of this reasoning has been developed by applying analogy to our domain of interest and the analysis of the relation between digital inclusion and individual functionings contained in the Vienna Study (Codagnone 2009, chapter 2).

The additional light orange box reflects supply side factors, under which we include both the market dynamic in the broadly defined industry and the dynamic of regulation and policy. Government can positively shape the level of eAccessibility that organisations implement in practice through its regulatory functions (see among others: Abilitynet et al 2005; EBU 2008; Leitner & Strauss 2008; Heerdt & Strauss 2004). On the other hand, with fragmentary and contradictory legislation and regulation, national Governments can make it even harder for ICT using organisations and the suppliers of ICT products and services to implement eAccessibility. In addition, governments should also adopt/fund support measures specifically targeting the individuals with disability (i.e. see Neff et al 2009; Pilling et al 2004) as complementary to the efforts to increase the level of eAccessibility / Web Accessibility. Finally, the broadly defined suppliers of ICT product and services, responding to either the regulatory environment or to the condition of demand, can also affect the level of Web Accessibility and the costs of introducing it. Evidently eAccessibility calls into question several different players of the ICT value chain, whose behaviour can have an effect on the level adopted by ICT user organisations (including government as provider of ICT enabled public services) affecting its costs[[18]](#footnote-18). Fragmentation in the eAccessibility value chains of products and services, combined with lack of integration of assistive technologies, can be an obstacle in accelerating the diffusions of eAccessibility (Yamada, 2007; RADAR 2010).

* + 1. User level

Empowerment of individuals is one of the contributions that the new 2010 Digital Agenda for Europe assigns to digital technologies: “The digital era should be about empowerment and emancipation; background or skills should not be a barrier to accessing this potential” (European Commission 2010d p. 24). In the relevant social science literature (see discussion in Neff et al 2009: pp. 2-3) the term ‘empowerment’ is used to mean both the “*capacity to cope with the requirements of life more efficiently*” and as the “*capacity to transform the conditions of life*”. “Labour market empowerment” is an example of the first type, whereas “Personal and social life empowerment” is an example of the second type, with “Welfare/Health empowerment” falling somewhere in between.

* + - 1. **Organisational level benefits[[19]](#footnote-19)**
         1. **Personal and social life empowerment**

The more intangible dimension of this area of impact concerns private and social lives and includes:

a) Psychological improvements for PwD in their “self-evaluation of level and quality of communication with others”;

b) “Their sense of independence and self-determination”;

c) “Access to on-line support groups and communication with family members”;

d) “Better control over others' perceptions through the anonymity of on-line identity” (Bradley and Poppen 2003; Bowker and Tuffin 2002; Cook et al. 2005; Grimaldi and Goette 1999; Guo, Bricout and Huang 2005; Seymour and Lupton 2004). After using the Internet PwD clearly perceive that the quality of their communication with others has improved (Bradley and Poppen 2003) and that also their sense of independence and self-determination has increased (Cook et al. 2005; Grimaldi and Goette 1999)[[20]](#footnote-20). The importance of accessible websites as a source of personal independence has been formally stated in the recently published “28 CFR Parts 35 and 36 Non-discrimination on the Basis of Disability in State and Local Government Services; Final Rules”[[21]](#footnote-21) (by the US Department of Justice) where it is affirmed that “Internet Web sites, when accessible, provide individuals with disabilities great independence, and have become an essential tool for many Americans”[[22]](#footnote-22). While not monetisable, the benefits included in this area of impact are very important for PwD and should always be kept in due considerations. Limited survey data are available but what is available clearly document these statements empirically: 48% of American PwD affirmed that going online significantly increased their quality of life (EFoD 2006b); 54% of PwD in the UK sampled in a survey considered Internet access essential, compared with only 6% in the general population (pilling et al 2004). So, the hypothesis we derive from the reviewed sources is the following: *IWA could positively impact on the private and social life of PwD through the mechanisms described above and also provide existence value for individuals without disabilities*.

A more tangible dimension in this area of impact concerns consumer welfare and more convenient access to public services. Firstly, from the economic theory we know that consumer choice and welfare improves if several kind of costs (switching costs, search costs, lock in costs) decrease (see among others Baye et al., 2006, Chen & Hitt, 2006 Farrel & Klemperer, 2007). Evidently the possibilities of eCommerce decrease such costs and should enable consumers to get better price/quality ratios for their purchase. Secondly, from a ground-breaking study funded by the Commission several years ago we know that using online public services produce considerable time savings for the citizens (Rambøl Management 2004). These time savings can be given a monetary value (applying at least the minimum wage) and represent a tangible and quantifiable potential benefit. So, the hypothesis we derive from the reviewed sources is the following: *IWA could enable PwD to improve their consumer welfare and access public services more conveniently*[[23]](#footnote-23).

* + - * 1. **Health and welfare empowerment**

It has been shown that Internet based services, information health awareness, and access to treatment can improve health outcomes, and also increase the subjectively perceived health related quality of life (Codagnone 2009, p. 27; Drainoni et al. 2004)[[24]](#footnote-24). It is well known that the burden of diseases (measured as Disability Adjusted Life Years, DALYs) is caused both by objective health conditions and by the subjective perception about how such conditions limit activities of daily life. Web Accessibility by increasing access to services and information, thus, can increase autonomy and reduce the perceived burden of the disease. This impact has been actually quantified in our study using Quality Adjusted Life Years. So, the hypothesis we derive from the reviewed sources is the following: *IWA could improve the health related quality of life for PwD increasing their QALYs*.

Increased Web Accessibility can also enable PwD better access to welfare related information and services. It is has been documented that many individuals eligible for public assistance through welfare programs and services (including unemployment benefits) do not actually apply to such entitlements due to lack of awareness or due to the social stigma associated with showing up to claim the entitlements (Blank and Ruggles 1996, Blume and Durlauf 2006, Cohen-Cole and Zanella 2008). The Internet, through spreading information more widely and by avoiding the stigma through anonymity, could increase the number of individuals eligible for welfare benefits who actually apply for them. Increased access to such welfare provisions raises income and reduces poverty. In this way it tackles one of the components of capacity deprivations. So, the hypothesis we derive from the reviewed sources is the following: *IWA could enable PwD to improve their access to welfare benefits*.

* + - * 1. **Labour market empowerment**

Labour market empowerment can be seen as synonymous with employability, which in its broad understanding is distinct from employment (see Garrido et al., 2009). It includes the capacity to search, get, and secure a job, but also to keep an existing job and possibly improve it in quality and income (reflecting the individual productivity). The literature showing that ICT use and skills increase individuals’ employability and wage level is reviewed in further depth in §5.3 of Annex 5.1, as it plays an important role in our quantitative projections. Here we only briefly and selectively discuss this issue. Digital skills increase human capital and thus improve employability and wage levels (Codagnone 2009, chapter 4). Use of the Internet, besides giving access to online job offers and recruitment platforms (especially now that many jobs are advertised only online), increases the social capital of individuals and their capacity to find a job through social networks (Bayes et al 2005; Borghans et al 2006; Ziesemer 2002)[[25]](#footnote-25). All of the above cited sources concern digital inclusion in general and do not focus specifically on disability issue, although the insights above can be evidently and justly applied by analogy to individuals with disability. The reasoning by analogy is that IWA translate into higher digital skills for PwD, both as a result of lower barriers and more frequent usage. Moreover, we found several sources generally mentioning employability in their discussion of eAccessibility or specifically of Web Accessibility (see for instance EBU, 2008; Kaye, H.S., 2000; Neff et al 2009; Work Research Centre 2008)[[26]](#footnote-26). So, our hypothesis is that “*Increased Web Accessibility could enable PwD to increase their employability and wage level*”.

* + - * 1. **Reduced social costs**

If PwD cannot work, their contributions to GDP are lost and the public budget receives less tax revenues and has to pay more unemployment benefits. If their productivity is lower due to health problems, also the economy as a whole has a loss. These are opportunity costs that should be summed up to other direct and indirect social costs such as: medical costs, the costs of assistance (direct costs in terms of subsidies, those for professional careers, indirect for family and friends). On these aggregate opportunity and social costs there is quite a vast literature[[27]](#footnote-27) dealing with the problem of disability as a whole with no specific reference to the issue of eAccessibility. For instance, a group of health economists working for Prevent Blindness America (PBA 2007), has estimated that the costs of the 3.7 million adult Americans that are visually impaired or blind to the US economy and society is $51.4 billion (about €37 billion) and include:

* €11.7 billion in direct medical costs (outpatients costs, inpatients costs and costs for drug prescriptions);
* €8.1 billion in other direct costs (government programmes, guide dogs, and nursing home costs);
* €4 billion in other costs to society (€3.7 billion out-of-pocket, direct expenditure by relatives for professional carers and medical cure, plus €300 million valuing the time spent by relatives and friends to care for blind and visually impaired people);
* €7.6 billion valuing the loss of health utility [monetised as amount of Quality Adjusted Life Years - (QALY) lost]
* €5.8 billion in productivity loss:
  + Lower labour force participation;
  + Lower wages.

Following a similar logic, a report commissioned by the Government of Ontario and realised by the Martin Prosperity Institute (Kemper et al 2010) estimated that lower educational attainment and work force participation among PwD living in Ontario represent great opportunity costs for the regional economy and that by removing barriers for access to education and work this could lead to increase in regional per capita GDP. Similar analysis and results have been produced also for the UK, where it has been estimated that (Evans 2007):

1. Improving the employment rate of people with disabilities to the national average would boost the UK economy by £13 billion (€19.4 billion), equivalent to a value equal to six months’ economic growth;
2. Improving the skills of people with disabilities to world-leading levels by 2020 would give a boost equivalent to 18 extra months of growth over 30 years, some £35 billion (€52.1 billion).

As stated, these contributions look at disability as a whole and consider traditional measures to tackle and reduce such costs, and none of them analyses the potential contribution of eAccessibility in general or Web Accessibility in particular. In Figure 3, by analogy, we are making the assumption that, if Web Accessibility does contribute to increase labour and health/welfare empowerment of people with disabilities (assumption derived from the sources reviewed in this and in previous paragraphs), then it contributes in the same way as traditional measures to remove barriers and reduce the lost opportunities and the social costs. So, the hypothesis we derive from the reviewed sources is the following: *IWA could indirectly contribute, through labour and health empowerment, to reduce the opportunity and social costs deriving from the socially built barriers that prevent PwD to realise their full potential*.

* + - 1. **Organisational level benefits[[28]](#footnote-28)**

Considerably less evidence was found on organisational level benefits as compared to user level benefits. Basically a handful of articles suggest that Web Accessibility can potentially increase revenues, improve the social image and brand of firms as part of their Corporate Responsibility Strategy, and reduce costs as a result of the better technical performance of Web Accessibility or of increased employees productivity (Heerdt & Strauss 2004; Henry & Arch 2009; Leitner & Strauss 2008; Leitner et al 2006; Millman, 2002; Slatin & Rush 2003; W3C 2009e).

* + - * 1. **Social image and brand**

Corporate Social Responsibility (CSR) measures have been shown to improve corporate image and brand and potentially impact positively on revenue generation (see among many others, for instance, Moir 2001; Key & Popkin 1998; Weber 2008). By analogy this is applied to Web Accessibility as one component of CSR, although Web Accessibility is not yet included, for instance, in the Dow Jones Sustainability Index (De Andres et al 2009, p. 1777)[[29]](#footnote-29). Nonetheless, the hypothesis we derive from the reviewed sources is the following: *IWA could improve organisations’ social image and brand*. In addition these sources also mention a related potential impact: the avoidance of legal costs and fines deriving from litigation on non- compliance with legislation (that we consider among the key aspects).

* + - * 1. **Operational performance (benefits side)**

The potential increase in revenues as a result of online sales or purchases offline that have been triggered by online navigation can come from two mechanisms:

1. an expanded customer base including PwD and also the elderly[[30]](#footnote-30), both of which are sizeable;
2. technical improvements increasing the likelihood that individuals complete purchases online or find the information on items that they purchase offline, which include: improved rank in search engines, faster navigation and search, reduced download time[[31]](#footnote-31).

Finally, operational performance can improve also as a result of:

1. efficiency gains generated by moving online activities that would absorb much more labour if conducted traditionally (especially relevant for public administration online service provision, but also for firms’ activities such as Customer Relationship Management);
2. reduced costs due to dematerialisation of activities (channel switch in communication and dissemination).

It must be noted that not all sectors can benefit from the potential increase in revenues, which can be reaped especially in retail sectors such as tourism, financial services, retail, some ICT products and services bought to a great extent online (Leitner & Strauss 2008). So, the hypothesis we derive from the reviewed sources is the following: IWA could improve organisations’ operational performance especially in certain sectors through the various mechanisms described above.

* + - * 1. **Labour force productivity and quality**

Increase in labour productivity is the other side of the coin of the potential increase of wages for PwD possessing digital skills. So, although such possibility from the firms’ perspective is mentioned only by one scientific source (Neff et al 2009), the evidence earlier reported for the user level of analysis is sufficient to support this link. The quality of the workforce refers to the fact that by making their external online recruitment applications or simple postings more accessible firms can reach a wider range of talented employees in a more efficient fashion (McKinsey 2003 is the only source with some level of scientific reliability on this aspect). So, the hypothesis that can be derived from the cited McKinsey study is the following “Web Accessible online recruitment could enable firms’ to efficiently hire talented employees”.

* + - 1. **Organisational level costs**

On the issue of the extra costs needed to build an accessible Website from scratch and/or to retrofit an existing one, the secondary sources found are few and contradictory. The needed evidence, therefore, we gathered entirely from our field-work. Seven years ago it was observed that there were no studies reporting in detail evidence-based estimates of the costs of making a Website accessible and very contrasting opinions were to be found, ranging from those arguing that making a Website accessible has negligible costs, to those quantifying extra costs of up to 25% (Clark 2002). According, for instance, to a study by McKinsey the costs are negligible, whereas Richards and Hanson affirm that for large sites with a lot of legacy pages the costs are substantial (2004, p. 72). Seven years later, the situation has not improved according to the state of the art review provided in Leitner & Strauss (2008). This source also provides the basic hints that costs vary depending on the size of the organisations (more pages) and the functionalities included (payment systems, authentication, etc.).

In conclusion we could certainly assume that introducing Web Accessibility can have an effect on costs but we were not in the condition of formulating any more precise hypothesis as done in the previous sub-paragraphs. The actual quantification of the additional costs attributable to Web Accessibility had to be done only empirically as illustrated both in the section on the Business Case Tool §6 (for the micro level calculation) and in Annex 5.1 (for the macro level aggregate projection).

* 1. Key aspect snapshots and illustrations
     1. Premise

It is worth stressing once again that the key aspects are in close relations with the causal models and are derived as an operationalisation of the various hypotheses formulated in the previous paragraphs, and as such they found support in mostly the same sources cited there. They represented a step toward the definition of:

a) the items to be included in the Business Case Tool; and

b) which core variables should be considered in the quantitative projections. As such the key aspects are more granular and concrete with respect to the hypotheses of the causal models.

In §4.3.2 we report the matrixes of key aspects for all three technological domains, whereas in §4.3.3 we selectively include some illustrative evidences. The explanation and full illustration of key aspect with the indication of sources are presented in Annex 3.1.

* + 1. Key aspects matrixes
       1. **Web accessibility user level key aspects (only benefits)**

Figure 4 below plots the identified key aspects (in this case only benefits) for Web Accessibility against two dimensions[[32]](#footnote-32):

a) the nature of the benefit (monetary and non-monetary); and

b) the nature of applicable indicators (qualitative / quantitative).

Figure 4: User level key aspects matrix for Web Accessibility

Descripción: Web Accessibility Key Aspects: Users Level
This figure shows the following aspects of analysis:
Monetary Quantitative factors such as: Less costs for unemployment benefits, increase in wages, increase in disposable income from entitlements, increase in QALY (monetized), savings from using eCommerce, savings from using public online services.
Non Monetary Qualitative factors such as: control over others’ perceptions; wider and better social relations and communications; increase in access to chat, support groups, web 2.0; increase in everyday autonomy; increase in self-determination; increase in access to leisure and culture; increase in political participation.
Non Monetary Quantitative factors such as: increase in employment, increase in job retention, longer working lives, increase in access to entitlements, reduction in work days lost. 

Source: Study Consortium’s elaboration on sources cited in the text and included in the references

* + - 1. **Web accessibility organisational level key aspects (costs and benefits)**

Figure 5: Organisational level key aspects matrix for Web Accessibility

Descripción: Organisational level key aspects matrix for Web Accessibility
This figure shows the following aspects of analysis:
Monetary Quantitative factors such as: Increase in sales, monetized efficiency gains, cost reduction from technical improvements, personnel costs, capital expenditure costs, additional development costs, monitoring/testing costs.
Non monetary Qualitative factors such as: improvement in social responsibility and image, compliance with legislation, limitation to creativity, limitations to security. 
Non Monetary quantitative factors such as: increase in employee’s productivity, larger audience/reach, better rank in search engines, reduction in search, navigation, and download times. 
Cross cutting through Non Monetary Qualitative and Quantitative results factors such as: more effective online advertising, more effective recruitment process.

Source: Study Consortium’s elaboration on sources cited in the text and included in the references

* + - 1. **DTV user level key aspects (only benefits)**

Figure 6: User level key aspects matrix for DTV

Descripción: User level key aspects matrix for DTV:
Digital TV Key Aspects: Users Level
This figure shows the following aspects of analysis:
Non monetary Qualitative factors such as: broadly defined empowerment, improved access to leisure. 
Non monetary quantitative factors such as: increase in reach, bridging digital divide. 
One cross cutting non monetary qualitative and quantitative factor mentioned was an increase in interactive learning. 
There were no monetary features mentioned.

Source: Study Consortium’s elaboration on sources cited in the text and included in the references

* + - 1. **DTV organisational level key aspects (costs and benefits)**

Figure 7: Organisational level key aspects matrix for DTV

Descripción: Digital TV Key Aspects: Organisational Level
This figure shows the following aspects of analysis:
Monetary Quantiative factors such as: increased sales, new revenue streams, costs of new solutions from scratch, costs of digital switchover, support and marketing costs.
Non monetary qualitative factors such as: consistency of interfaces, compliance with legislation.
Non monetary quantitative factors such as: increased audience/coverage.


Source: Study Consortium’s elaboration on sources cited in the text and included in the references

* + - 1. **SST user level key aspects (only benefits)**

Figure 8: User level key aspects matrix for SST

Descripción: Figure 8:
Self-Service Terminals Key Aspects: Users Level 
This figure shows the following aspects of analysis:
The monetary quantitative factor discussed was consumer welfare
Non monetary qualitative factors such as: Increase in convenience and increase in autonomy.
No non monetary quantitative factors were discussed.
The cross cutting non monetary quantitative and qualitative factor discussed was more participation to public sphere politics/eVoting.

Source: Study Consortium’s elaboration on sources cited in the text and included in the references

* + - 1. **SST Organisational level key aspects (costs and benefits)**

Figure 9: Organisational level key aspects matrix SST

Descripción: Self-Service Terminals Key Aspects: Organisational Level
This figure shows the following aspects of analysis:
Monetary Quantitative factors such as: increased sales, monetized efficiency gains, cost reduction from technical improvements, costs of redesigning existing SSTs, additional costs of building accessible SSTs from scratch compared to a non-accessible one.
Non monetary qualitative factors such as: improvement in social responsibility and image, compliance with legislation.
The non monetary quantitative factor discussed was increased audience. 


Source: Study Consortium’s elaboration on sources cited in the text and included in the references

* + 1. Key aspects selective illustrations
       1. **Web accessibility user level**

The sources quoted in the box below provide an example of the social opportunity cost (or to put it the other way around the potential contribution) for economy as a whole of not fully including PwD.

Box 3: Estimates of opportunity costs from Ireland and UK

* In Ireland it has been estimated that an increase of just 1% in the employment rate of people with disabilities of working age would result in savings to the public purse (based on avoidance of disability payments and increased tax take) of between 8 and 20 million euro per annum, depending on whether the employment is in a minimum or average wage job (Work Research Centre p. 10).
* UK: Contribution to GDP 1. In the UK improving the employment rate of people with disabilities to the national average would boost the UK economy by €19.4 billion), equivalent to a value equal to six months economic growth (Evans 2007, p 1, and passim). This report, however, does not make any reference to the contribution of ICT.
* UK: Contribution to GDP 2. Also in the UK another source (Freshminds/ UK Online Centres 2007, p. 22) estimates each additional digitally-engaged citizen adds more than €252 to GDP over three years. So by simply with disability into digitally engaged citizens efforts into Web Accessibility could contribute to economic growth.

The statement in box below from the European Blind Union (EBU) sheds light on the fact that lack of eAccessibility may prevent PwD to have adequate wage levels.

Box 4: Blind people may be cut out from the opportunity to earn more.

“The use of ICTs, and personal computers in particular, is now prevalent in most workplaces. This has the potential to offer many more job opportunities for blind and partially sighted people, but only if personal computers and intranets are accessible. A recent study carried out by the Centre for the Economics Education in the UK "Use IT or Lose IT? The impact of computers on earnings" (2007) even estimates the wage premium for being able to use the Internet and the email to be around 10% - it is essential that blind and partially sighted people, and other people with disabilities, are not put at an economic disadvantage because of eAccessibility issues”.

Source: European Blind Union (EBU 2008, p. 16)

The sources quoted in the next box estimate the amount that PwD could save on average if IWA would enable them to use eCommerce, Internet Banking, and eGovernment.

Box 5: Savings from online shopping and banking and from eGovernment (UK and Ireland)

* **Online shopping in UK**. In the UK, it has been shown that online costs are 14% lower for food and basic shopping goods, 15% lower on travel, and 21% lower on other services, and it has been estimated (on the basis of an average consumer basket) that consumers who shop online save on average €358 per annum. For some people with disability this may be equivalent to 10 days of income, which inaccessible Websites prevent them from saving.
* **Internet banking in Ireland**. In Ireland estimates that customers who are not able to use phone or Internet banking could face additional costs of €32 per annum or could lose as much as €61 gross for a one-year €5,000 deposit on a savings account because online savings accounts have higher interest rates.
* **Ireland estimate**. According to the only available EU benchmark completing online and eGovernment transactions save citizens on average €69. Applying the Irish minimum wage and assuming that all of the people with disabilities in Ireland who currently do not use the Internet complete at least 3 eGovernment services online, Work Research Centre estimates that this could be worth €8 million per year in Ireland.

Sources: FreshMinds /UK online centres (2008 p. 7-8), Work Research Centre (2008 p. 7-9); Rambøl Management, (2004).

* + - 1. **Web accessibility organisational level**

The next three boxes illustrate the potential organisational level benefits of increased sales from wider customer reach. The first two are probably best practice cases and might not be representative of what all organisations can achieve, also in light of the caveat we introduced earlier (at the end of §4.2.1.2). **¡Error! No se encuentra el origen de la referencia.** on the other hand, shows the broader and more realistic perspective of IWA as an improvement in marketing strategy and customer retention.

Box 6: Legal & General: wider and better reach produce money

The financial firm Legal & General after redesigning its Website to be fully accessible (effective July 2005), achieved the following improvement in technical performances:

* 30% increase in natural (not paid for) search engine traffic
* Significant improvements in Google rankings for all target keywords
* Time for a page to load reduced by 75%
* An additional 13,000 visitors each month thanks to improved browser compatibility (including PDAs, mobiles, Blackberry and other handheld devices)
* Speed and effort for managing content (i.e. updating and maintaining it) was reduced from an average of 5 days to 0.5 days for each job
* These translated into the following hard figures:
* 95% increase in online life quote requests
* 90% increase in online life insurance sales
* 100% return on investment in 5-6 months
* An estimated saving of £200k annually on site maintenance (representing a 66% saving)

*Sources: Abrahms (2007), Davies (2007), eConsultancy (2007), Lawson (2006), Nicholl (2006), Sloan (2006), Thatcher et al (2006), Wilton & Howell (2007), W3C (2009a)*

Box 7: Tesco: £ 35,000 investment yields £ 13 million annually

Tesco, the leading online grocery supplier in the UK, produced the Tesco Access site using a panel of visually impaired shoppers. This site offered an alternative to the high-graphic content of the mainstream version of the site. The 15-minute rule (30 items purchased over a 56K connection in 15 minutes or less) has always been an important aim of the Tesco site. By having Tesco.com and Tesco Access side-by-side, all users could finally benefit from the 15-minute shopping. Many fully-sighted people found Tesco's Access site easier to use than other sites. Although originally designed for visually impaired users, the site attracted a much wider audience. Since redesign the sales through the Website increased spending by £13 million annually, which is a fraction of the original cost of £35,000 to develop the accessible site. As a result of their commitment to accessibility, Tesco had for little extra cost a site that could be easy to access from other devices, such as PDAs, Web TV and Pocket PCs with low speed connections and/or limited screen sizes.

Update: Encouraged by the success of the “Access” version, Tesco has now developed a brand new and unified main Website which is now fully accessible thus further reducing maintenance costs.

Sources: EFoD (2006b), W3C (2009b)

Box 8: Two US corporations use accessibility to reach wider audiences

**Verizon Wireless: Web Accessibility to reach a market worth $200 billion (in the US)**

“Verizon Wireless realized that an accessible Website makes business sense. The company, like all wireless carriers, is in a battle for new customers, many of whom will already have a wireless provider. It is a market affected by high customer churn rates and any advantage is critical. By removing barriers for disabled customers, Verizon Wireless sees the ripple effect from promoting its Website's accessibility features. ―The return isn't just the customers themselves, but also the family members, doctors, and home-care providers, says Barbara Kaplan, national marketing operations manager. ― We know that by touching one person we're also touching that many more” (CRG & IBM 2008, p. 10). “There are definitely revenues to be made. We know the [market for] the disabled and the periphery of people around them is over $200 billion.” Verizon Wireless (reported in CRG & IBM 2008, p. 10).

**TIAA-CREF: Web Accessibility as part of building a bigger “storefront”**

“For TIAA-CREF, a leading investment financial services company based in New York, an accessible Website ties into the broader corporate ambition to build a bigger storefront. The redesign of the Website happened in parallel to the opening of more offices on college campuses closer to the company‘s key markets, and adding TDD technology to call centres. As a retirement products provider, it makes business sense for TIAA-CREF to remove as many barriers as possible that would prevent its customers, especially the more senior, from completing transactions online… Usability and accessibility were critical in the site redesign. In the first half of 2007, TIAA-CREF‘s clients completed nine million online transactions on the redesigned Website, from simple administrative tasks to fund transfers. By keeping the Website simple, direct and usable, TIAA-CREF's accessibility initiative ―has helped not just the target audience, but everyone, says Rowena Track, senior vice president of Web and e-business strategy and solutions… She advocated for a no-frills site that could be easily used by those with sight-, hearing- and motor-skill limitations. The notion made perfect business sense: Sixty-five percent of TIAA-CREF participants are older than 45. So are 97 percent of those in its affluent and high-net-worth segments… TIAA-CREF took the wraps off its new Website in 2006. Positive reviews from clients continue to pile up. The company regularly issues a Web-based survey to measure online customer satisfaction. Each month's satisfaction number climbs higher than the previous month's. Small wonder, then, that TIAA-CREF is confident that continuing its accessibility efforts is a competitive advantage” (CRG & IBM 2008)

Source: CRG & IBM (2008, p. 10)

The next box provides an estimate produced for Ireland of the efficiency gains that could accrue to government if more PwD would use online public services.Savings for government from increased usage of online public services (Ireland estimate)

Box 9: Ireland estimate.

In Ireland, for instance, the Revenue Commissions have estimated that they have saved €10.5 million in 2005 from their online filing and payment system. If the barriers to Internet access were removed and just 20% of people with disabilities completed 3 eGovernment transactions a year, a savings of almost €4 million would accrue to Government (WRC, p 10 based on fresh minds).

Source: (World Research Centre, p10 based on Fresh Minds UK)

The box below, on the other hand, shows how IWA has produced better web metrics for two governmental online portals.

Box 10: Accessibility increase government portal metrics

**West Virginia eGovernment and educational portal**

After redesigning its eGovernment portal (providing access to various public services) and educational portal, the State has achieved increased usage of the two portals and increase in the total number of service transactions completed online. Since the eGovernment portal went live, usage has increased 24 percent compared to the same period last year, with an average of 242,745 unique visitors per month. People are staying longer on the site as well, with the average length of stay at 13 minutes, an increase of 20 percent over the last version. Similarly, the West Virginia Education Portal is the nation’s first state educational portal that functions as an access point to all state education resources for all students without any barrier and has already won two awards from the Centres for Digital Government and Education. This increase in usage of online services is benefiting the State in many ways, including saving money, and improving collaboration among its employees (Microsoft 2009b).

**Irish Department of Social Family and Affairs**

The Department of Social and Family Affairs in Ireland promotes a caring society by providing income and other supports to enable active participation in society, promote social inclusion, and support families. It wanted to use the reach and immediacy of Internet communications to raise public awareness of its mandate and provide secure eGovernment services. To accomplish these goals, the Department redesigned its Website and made it accessible. The redesigned site boasts 50 percent more content, improved search, intuitive navigation, and new online services. It won an Irish eGovernment accessibility award. The new portal is supported by a streamlined Web publication process that significantly reduced the time required for major site updates. Since launch, average weekly visits to the site have increased by approximately 20,000, or 53 percent and form downloads have also increased. E-mail requests for more information have more than doubled in the same period. “An increasing number of our customers are choosing our Web site as their main communication channel with the Department,” says Scully. “This will be of great assistance in achieving our objective of maximizing customer service and minimizing the cost of delivery.” This is important considering the sheer amount of work carried by this agency: With offices in several locations across Ireland, the Department of Social and Family Affairs develops social protection policies and manages the delivery of statutory and non-statutory schemes and services. The Department is responsible for a range of social insurance and social assistance schemes. More than 1 million people each week claim a social welfare payment and, when qualified adults and children are included, a total of more than 1.5 million people benefit from weekly payments. The total expenditure by the Department in 2008 was just under €17.8 billion (U.S. $24.9 billion) with an estimate for 2009 of expenditure in excess of €21 billion ($29 billion) (Microsoft 2009c).

The Box below illustrates the case of General Electric with respect to IWA and improved social responsibility and image.

Box 11: General Electric Universal Design Vision also on the Web

The declared objective of General Electric (GE) is "Universal Design for every product, service and function of the company. The Website cannot be an exception." CRG & IBM (2008, p. 11).

"To understand the vision of GE, look no further than the $163-billion conglomerate's revamped Website. Whether you want to check the stock price, apply for a job, or learn about gas turbines, [www.ge.com](http://www.ge.com) is inviting and useful.

GE is well known for its breadth of products and services. Key to its success as a builder of home appliances is the adoption of Universal Design, an idea that products should be easy to use by the widest possible range of consumers – removing any barriers that exist between the product and the customer.

GE‘s bold embrace of inclusiveness and collaborative design -- no easy feat when you sprawl across 100 nations and employ 300,000 -- reflects its clear outlook of the world, not to mention its customer base, as a diverse place comprised of people of different purposes and abilities.

GE took the wraps off the redesigned Website for which broader accessibility was a key goal. The Website designers had to follow the same rules as the products division; one Website, all customers. This philosophy was not driven by W3C Standards; it was part of a wider vision, looking at every potential user and what would stop them using the Website efficiently.

GE chose a clean, uncluttered look. The home page is easy to use by the vast array of customers, job seekers, analysts, investors, and journalists who visit it. ―It's been an evolution for us says Walsh of the redesigned site. ― For many people, the Website is the first touch point for the company, Walsh says. ― Given our breadth and depth, it's important to be accessible. "

Source: (CRG & IBM 2008, p. 11)

IWA can help organisation comply with legislation and avoid the legal costs incurred by the case described below.

Box 12: Lawsuits costs Target Corporation $6 million in class damages

As a final result, in 2008 Target Corporation settled class action lawsuit with the NFB and agreed to pay class damages of $6 million. No doubt that making the Web site accessible would have cost, using the possibly most expensive estimate, no more than 3% of what the corporation had to pay in damages.

Target Corporation operates some 1600 stores throughout the continental United States as well as Hawaii and Alaska, offering discount consumer products. In 1999 Target moved into online sales with the launch of Target.com, and in 2005 Target broke the $50 billion annual sales barrier with approximately $50 billion annual sales. Currently its Website registers 934,265 unique visitors daily. In 2005 the National Federation of the Blind (NFB), notified Target Corporation that its Website, Target.com, was not accessible to blind and visually impaired users. Key issues cited were:

* a lack of alternative (alt) text on the site
* online purchases could not be completed without the use of a mouse
* image maps to show store locations were inaccessible
* many headings important to navigating the site were missing

As Target Corporation would not commit to any action to remedy this, in 2006 NFB filed a lawsuit alleging that Target.com's lack of accessibility violated two Californian acts and one federal act (all concerning civil rights and anti-discrimination issues). Nevertheless, Target Corporation settled the class action lawsuit filed by NFB in August 2008 and agreed to pay class damages of $6 million.

Source: W3C (2009c).

1. Main findings from empirical field work
   1. Main findings of FLEQ

The results of the questionnaire administered to organisations are reported in full in § 4.2 (Annex 4.1) with the supporting graphics and tables. Below we summarise the most noteworthy findings:

* As far as the drivers for launching an accessible Website, the respondents to the FLE Questionnaire (henceforth FLEQ) mentioned: compliance with the legal requirements, support of the company CSR policy, and the aim of widening the number and characteristics of users (targeting users and customers with disabilities). In addition, some of the commercial and/or NGO bodies who cooperate and contract with Public Administrations on eAccessibility issues were obliged to meet Web Accessibility standards by those administrations.
* The most significant cost factors in developing an accessible web site, according to the view of the respondents to the FLEQ, were the use of web developers and of external consultants and experts. As for these two components, 75% of our respondents[[33]](#footnote-33) deemed (in relative terms) the costs for web developers to be medium or high (29% medium, and 46% high), and 80% of our respondents deemed the costs for external consultants to be medium or high (29% medium, and 51% high).
* Only less than one third of the respondents, however, provided quantified details about the annual real costs of developing and maintaining their Websites. We can conclude that quantitative monitoring of Web Accessibility costs is not at all widespread. Moreover, the figures provided varied so much that they could hardly be considered reliable.
* Only a quarter of the respondents to the FLEQ have already evaluated the benefits of increased Web Accessibility and did so as a sort of a one shot exercise, since only a small fraction of these 25% steadily and systematically keep track of relevant costs and benefits data. Thirty-one percent of the respondents affirmed they were planning to undertake evaluation in the future, whereas 47% do not plan to undertake any evaluation activity to assess costs and benefits.

Despite this lack of hard evidence on costs and benefits, nonetheless the respondents to the FLEQ answered question showing their perception about the importance of various kind of benefits:

* The top two perceived benefits mentioned for importance were: a) improved social image; b) compliance with legislation. As mentioned before, an improved social image was one of the most important reasons for launching or revamping a Website in order to meet Accessibility standards. The benefits of these improvements are, in the respondents’ views, a decrease in user complaints, a better profile in media publications and public reports, and for the UK Websites the “two ticks accreditation” (a symbol that indicates that an employer has made a commitment to supporting or employing people with disabilities). The respondents also underlined the importance of external factors, most notably compliance with legislation;
* At the opposite end of the scale of importance, the bottom three benefits in order of importance attributed by the respondents were: a) costs savings from channel switch from traditional channels to the website; b) more online sales; c) more offline sales. So, the more tangible economic benefits are listed at the bottom;
* In between the top and bottom benefits in terms of importance assigned by the respondents we find benefits related to the increased reach coming from better operational performance of accessible web sites (usability and user-friendliness: more web users in general, more web users with disabilities or with less digital skills, lower bounce rates (indicating increased user retention);
* Despite the lack of quantitative evidence, most respondents showed to be overall satisfied with the introduction of Web Accessibility.

Finally, as far as the methods of accessibility testing are concerned, the majority of the companies use expert testing and many also half automated and user testing. Half of the companies use third-party certification and less than one third relies on self-declaration of conformity.

* 1. Main findings of case studies

The study team elaborated 24 case studies among organisations of different countries and sectors. A selection of cases is available at <http://www.eaccessibility-impacts.eu/>. It is worth reminding that case studies, selected through a methodology to maximise their representativeness, aims to gain a more in-depth understanding of a phenomenon, rather than making the overall quantitative summary generalisation that are possible on the basis of random sample surveys. This is important to have in mind when reading the main findings of the case studies.

The case studies have to a large extent confirmed and strengthened the findings of the Field Level Evidence, in particular on the following issues:

* Awareness and capabilities about precisely measuring and quantifying the costs and benefits of Web Accessibility are not widespread. Most organisations reported that they did not steadily measure costs and benefits before and after making their website accessible;
* Compliance with legislation and improved social image figure as the two main benefits of, and driver for, introducing Web Accessibility. No organisations affirmed that Web Accessibility was introduced with the explicit objective of achieving efficiency gains or increased revenues;
* We perceived an overall satisfaction with Web Accessibility, despite the lack of hard evidence on costs and benefits;
* No organisations reported extreme barriers and complexities for introducing Web Accessibility, although some difficulties were reported (see below).

In addition to these conclusions converging with those of the FLE, the more granular nature of the case studies information enables us to make other preliminary conclusions. Despite lack of hard and quantified evidence, respondents from the case studies reported the following opinions/perceptions:

* Redesign is very costly;
* The additional cost for developing an accessible site (rather than a ‘standard’ non-accessible site) is thought to be around 2%-5% of total cost;
* Monitoring accessibility guidelines is perceived as a source of additional costs;
* Most respondents mentioned as perceived or potential benefits (though we repeat that they were not able to provide quantified measurements), the following:

Potential audience expanded (reaching all citizens);

Usability and navigation improved;

SEO (Search Engine Optimisation) ranking improved;

Problems related to web management and maintenance decreased;

Maintenance costs improved.

* They all expressed their subjective and qualitative judgement that benefits outweigh costs

One of the main difficulties that individuals interviewed during the case studies mentioned concerns the issues of adapting some specific technologies to Accessibility standards. Problems of lack of awareness and expertise among the suppliers also emerged. Designing an accessible web site is still seen as an exception, rather than the rule, so it has to be specified explicitly every time. This problem also affects suppliers and it is often necessary to make specific adaptations in the platforms to allow accessibility. Yet, these and other difficulties were overcome and no organisation reported complexities blocking their implementation. From the cases showing lack of accessibility we could also extract the main causes/attitudes behind it as expressed by the interviewed individuals:

* The main stakeholders do not see people with disabilities as a “target group”;
* False myths: “Accessibility is hard to implement and expensive”;
* Lack of knowledge among web developers;
* Lack of a culture and practice of social responsibility;
* No input from specific legislation;

We can conclude making some of the elements above more concrete by selectively recalling what emerged from three of the case studies:

* Some businesses make strong investments and accurately measure costs and benefits, followed up by real commitment to Web Accessibility, for instance, by building an IT Accessibility Centre of Excellence (as in the case of a large UK banking group[[34]](#footnote-34)). In such circumstances one finds also a better and more precise quantification of the costs and benefits. For instance costs are sizeable and do include the need to change ICT equipment and infrastructure, but they are more than balanced by the wide increase in audience and by the tangible benefits deriving from it (increased sales and reduction of transaction costs from channel switch). This can be preliminarily interpreted in a way that could also help make sense of some of the findings from FLE. When the awareness and the importance attributed to Web Accessibility are high, this translates into a more structured process of measuring and monitoring costs and benefits, where also tangible benefits are considered in order to obtain from top management the required funds;
* DEFRA UK: They started for reasons of compliance but discovered customer satisfaction and other advantages as well. Complete website redesign was undertaken mainly for compliance purposes, but after implementation they learnt that customers were more satisfied, the Accessible website became a marketing tool and improved social image, and Search Engine Optimisation increased. This show once more that Web Accessibility costs and benefits can be achieved and eventually measured, provided that awareness about them is spread and measurement capacity built;
* Birmingham Council: focus of evaluation is on accessibility standards. This public body implemented accessibility and a complete site redesign to make more than 1000 web pages compliant with WCAG 2.0 AA level. Main reasons were to better serve citizens with disability, in accordance with the council equality policies and the legal requirements. They invest efforts in evaluation and measurement in terms of user testing and WCAG auditing. So, costs and benefits measurement recommendations and guidelines could be embedded into the laws mandating Web Accessibility and/or the WCAG guidelines. In the future this may increase the number of organisations that measures costs and benefits.
  1. Findings of web consultancies’ questionnaires

Neither the desk research, nor the FLEQ distributed to organisations, nor the case studies enabled us to come up with a reliable and consistent parameter about the additional costs attributable solely to making a web site accessible. In order to fill this gap in the literature and to produce a parameter that could be used in our quantitative projections we combined the results of the questionnaire to web consultancies with evidence from case studies, and with some assumptions in order to produce the first version of the Business Case Tools. This articulated quantification of costs is presented in Annex 5.1. Here, we summarise the findings of the questionnaire distributed to web consultancies firms in several European countries[[35]](#footnote-35), which is available at <http://www.eaccessibility-impacts.eu/>.

* + 1. Web design and layout[[36]](#footnote-36)

The average price charged for the Web design when accessibility criteria are followed for a Website using less than five templates is €2,279[[37]](#footnote-37). If the number of templates is between 5 and 10 the price is €5,232 and with more than 10 templates the price is €9,737.

Table 2: Price per number of templates of the Website

| Number of templates of the Website | **< 5** | **≥ 5 and < 10** | **≥ 10** |
| --- | --- | --- | --- |
| Average price in local currency | €2,279 | €5,232 | €9,737 |

Source: Study Consortium’s elaboration

Whereas if no templates are used[[38]](#footnote-38) the price for less than 20 pages is €1,857, between 20 and 40 – €5,718 and more than 40 – €7,844.

Table 3: Price per number of pages

| Number of pages of the Website | < 20 | ≥ 20 and < 40 | ≥ 40 |
| --- | --- | --- | --- |
| Average price in local currency | €1,857 | €5,718 | €7,844 |

Source: Study Consortium’s elaboration

The price of the Web design does not differ when the accessibility criteria are followed for the majority of the respondents (89%). Only one consultancy charges more for Web design (20%) when asked to apply accessibility criteria.

* + 1. Content production

In the case of designing a Website from scratch, the average price per page for producing content (in case of applying WCAG 2.0 AA) when using WYSIWYG34 editors is €72, CMS – €53 and €63 for collaborative portals. For the majority of the consultancies the price of content production does not change when accessibility criteria are followed (75%). For another 25%, the price decreases in case of not applying the accessibility criteria and the percentage of decrement when using WYSIWYG editors is 37,5%, CMS – 10% and 12,5% for collaborative portals. If the consultancy redesigns a Website in order to make it accessible (reusing contents when possible), the average price for converting content per page price ranges between €10 and €860 for WYSIWYG editors, €10 and €1,720 for CMS and €10 and €192 for collaborative portals.

* + 1. Evaluation and certification

An average amount of cost declared by our respondents[[39]](#footnote-39) for consultancies’ clients of a self-evaluation for a supplier’s declaration of conformity when evaluating and/or certifying an accessible informative Website with less than 500 pages is €1,721, between 500 and 2000 pages – €3,742 and with more than 2000 pages – €4,939. In case of an evaluation by third parties the price for a website with less than 500 pages is €3,528, between 500 and 2,000 – €5,657 and with more than 2000 pages – €5,725. In case of an evaluation and certification the average price is €4,342 for less than 500 pages, €7,907 for a Website with 500-2,000 pages and €6,629 for a Website with more than 2,000 pages.

Table 4: Evaluation costs per number of pages of the Website (informative Website)

| Number of pages of the Website | < 500 | ≥ 500 and < 2000 | ≥ 2000 |
| --- | --- | --- | --- |
| Average cost for your clients in local currency of a self-evaluation for a supplier’s declaration of conformity | €1,721 | €3,742 | €4,939 |
| Average price in local currency of an evaluation by third parties (i.e. your organisation) | €3,528 | €5,657 | €5,725 |
| Average price in local currency of an evaluation and certification by third parties (i.e. your organisation) | €4,342 | €7,907 | €6,629 |

Source: Study Consortium’s elaboration

If the requirements of accessibility level are reduced to the Level Single A, the average decrement in cost for a self-evaluation for a supplier’s declaration of conformity is 14%, of an evaluation by third parties – 17%, and of an evaluation and certification by third parties is 16%.

The average price that the consultancies charge for evaluating and/or certifying an accessible interactive or transactional Website in case of a self-evaluation for a supplier’s declaration of conformity for a Website with less than 500 pages is €2,495, between 500 and 2,000 – €5,249 and more than 2,000 pages – €5,384. In case of an evaluation by third parties the average prices are as follows: €4,392, €5,346, €6,970. In case of evaluation and certification by third parties the costs are €5,058, €7,302, €7,760 respectively.

Table 5: Evaluation costs per number of pages of the Website (interactive Website)

| Number of pages of the Website | < 500 | ≥ 500 and < 2000 | ≥ 2000 |
| --- | --- | --- | --- |
| Average cost for your clients in local currency of a self-evaluation for a supplier’s declaration of conformity | €2,495 | €5,249 | €5,384 |
| Average price in local currency of an evaluation by third parties (i.e. your organisation) | €4,392 | €5,346 | €6,970 |
| Average price in local currency of an evaluation and certification by third parties (i.e. your organisation) | €5,058 | €7,302 | €7,760 |

Source: Study Consortium’s elaboration

If the requirements of accessibility level are reduced to the Level Single A, the average decrement in cost of evaluation and/or certification are for a self-evaluation for a supplier’s declaration of conformity - 14%, for an evaluation by third parties - 17%, and for an evaluation and certification by third parties - 16%. An average cost for consultancies’ clients of a self-evaluation for a supplier’s declaration of conformity when evaluating and/or certifying an accessible multimedia Website with less than 500 pages is €2,533 between 500 and 2,000 – €4.833 and for a Website with more than 2,000 pages - €4,967. In case of an evaluation by third parties the price for a Website with less than 500 pages is €1,290, between 500 and 2,000 – €3,847 and €5,167 for a Website with more than 2,000 pages. Finally, in case of an evaluation and certification the average price is €1,790, €4,780 and €6,296 respectively.

Table 6: Evaluation costs per number of pages of the Website (multimedia Website)

| Number of pages of the Website | < 500 | ≥ 500 and < 2000 | ≥ 2000 |
| --- | --- | --- | --- |
| Average cost for your clients in local currency of a self-evaluation for a supplier’s declaration of conformity | €2,533 | €4,833 | €4,967 |
| Average price in local currency of an evaluation by third parties (i.e. your organisation) | €1,290 | €3,847 | €5,167 |
| Average price in local currency of an evaluation and certification by third parties (i.e. your organisation) | €1,790 | €4,780 | €6,296 |

Source: Study Consortium’s elaboration

If the requirements of accessibility level are reduced to Level Single A, the average decrement in cost are 10% for a self-evaluation for a supplier’s declaration of conformity, 14% for an evaluation by third parties and 12% for an evaluation and certification by third parties.

* + 1. Upgrading technologies and tools

The costs for upgrading technologies and tools when redesigning a Website from an already existing non-accessible Website for majority of the respondents (71%) vary significantly and are applied on a case-by-case basis. For two consultancies they are quantifiable figures. The average cost upgrading to CMS in informative Websites are €4,000-5,000, for collaborative portals €4,000-7,000. The average costs for upgrading to CMS in interactive Websites €5,000 and €9,800, €5,000 and €13,000 for collaborative portals. Finally, the average costs for upgrading to CMS in transactional Websites are between €10,000 and €12,600 and to collaborative portals €10,000 and €16,000.

* + 1. Hosting

The average costs of hosting a Websites are €743 per year and in case of applying the accessibility requirements they amount for €2,335.

* + 1. Buying evaluation tools

The majority of the consultancies’ clients use free trials of accessibility evaluation tools and/or ATs (82%), only 18% buy these tools (with a €2,000 average price).

* + 1. Additional testing and certification maintenance costs

For the majority of the consultancies surveyed the price they charge for additional testing and certification maintenance[[40]](#footnote-40) varies significantly and is applied on a case-by-case basis (64%). For more than one third (36%) it is a quantifiable figure. The average costs for the additional testing and certification maintenance per year in local currency of a self-evaluation for a supplier’s declaration of conformity for a Website with less than 500 pages is €550, between 500 and 2,000 pages the price is €900 and for a Website with more than 2000 pages – €1,750. In case of an evaluation by third parties the prices are €1,000, €1,250 and €2,200. In case of an evaluation and certification maintenance the prices are €1,950, €3,000 and €4,200. Some of the respondents do not charge extra for the additional testing and certification maintenance. If the requirements of accessibility levels are reduced to Level Single A, the percentage of decrement in the costs of a self-evaluation for a supplier’s declaration of conformity is around 5%, 10% in the case of an evaluation by third parties and 6% in the case of an evaluation and certification maintenance.

Table 7: Additional testing and certification maintenance costs

| Number of pages of the Website | < 500 | ≥ 500 and < 2000 | ≥ 2000 |
| --- | --- | --- | --- |
| Average cost for your clients per year in local currency of a self-evaluation for a supplier’s declaration of conformity | €550 | €900 | €1,750 |
| Average price per year in local currency of an evaluation by third parties (i.e. your organisation) | €1,000 | €1,250 | €2,200 |
| Average price per year in local currency of an evaluation and certification maintenance by third parties (i.e. your organisation) | €1,950 | €3,000 | €4,200 |

Source: Study Consortium’s elaboration

1. The Business Case Tool

The main and key output of the work on the Business Case Tool (BCT) is by far the interactive excel tool delivered separately. The study team produced two different versions of the BCT, one intended to be used for calculating the estimations and extrapolations (labelled as **BCT Macro**) and another one aimed to be used by users willing to calculate the costs and benefits for their organisation if their website is rendered accessible (labelled as **BCT Micro**) (both can be accessed at <http://www.eaccessibility-impacts.eu/researchResults.aspx>). The latter has a more user-friendly interface/layout, and is intended for being disseminated among stakeholders interested in assessing the extra cost of web accessibility.

It is important to stress that BCT Micro is an easy-to-use tool can be used by organisations willing to assess ex ante and/or ex post the costs and benefits of their investment into web accessibility in a flexible way. Web managers can use it not only by inputting their own data for all the items, but also with only a minimum set of information: given a limited input into the excel, the tool will yield a full calculation thanks to the estimation procedures that is embedded into it (Annex 4.1). The tool is easy to use and fully documented. For this reason we limit ourselves to a synthetic description of its logic and main components.

The logic and design of the Business Case Tool was derived directly from the causal model of Web Accessibility and from the corresponding organisational level key aspects (costs and benefits). Between this initial conceptual-theoretical step and the final analytical tool, we have gone through several empirical and validation steps. The BCT was tested through case studies, integrated with the findings of the questionnaire to web consultancies, and modified as a result of validation with web accessibility experts.

For the ease of reference we report again the matrix of key aspects for organisational level costs and benefits of eAccessibility.

Figure 10: Organisational level key aspects matrix for Web Accessibility

Descripción: Organisational level key aspects matrix for Web Accessibility
Web Accessibility Key Aspects: Organisational Level
This figure shows the following aspects of analysis:
Monetary Quantitative factors such as: Increase in sales, monetized efficiency gains, cost reduction from technical improvements, personnel costs, capital expenditure costs, additional development costs, monitoring/testing costs.
Non monetary Qualitative factors such as: improvement in social responsibility and image, compliance with legislation, limitation to creativity, limitations to security. 
Non Monetary quantitative factors such as: increase in employee’s productivity, larger audience/reach, better rank in search engines, reduction in search, navigation, and download times. 
Cross cutting through Non Monetary Qualitative and Quantitative results factors such as: more effective online advertising, more effective recruitment process.


Source: Study Consortium’s elaboration on sources cited in the text and included in the references

This was the original list extracted from the causal model in the most exhaustive way possible. This list was later operationalised for the BCTs also in light of the results of empirical field-work (questionnaire responses from almost 30 organisations, questionnaire responses from 11 web consultancies, case studies) and of the validation process. As a result the key aspects that we discuss in the next paragraphs reflect largely but not perfectly on those included in the matrix above. Some have been better formulated while others have been removed in light of little feasibility of their measurement. The work on the BCTs concentrated largely on the issue of costs. On benefits we found a large enough set of consensual scientific and a non-scientific sources indicating and supporting mostly the same typology of benefits, but on the issue of Web Accessibility costs we found basically no scientific sources and only contradictory views coming from different involved parties.

On costs, some parties argue that they are non-existent while others claim that they are prohibitive and high. Therefore from scratch we build a methodology to identify and measure the extra costs attributable solely to Web Accessibility (Annex 4.4). Our analysis of costs is unique and should be a major contribution to the field. It is on this analysis that we have built the quantitative macro aggregation of organisational costs (see results in § 7.1.8 and procedure in Annex 5.1).

Our Interactive Excel based tool (illustrated in §6.3) will enable web managers to calculate the costs attributable to web accessibility, separating them from those cost items that would have to be incurred in any case when developing a website irrespective of whether accessible or not accessible. We have separated the web accessibility specific costs from the costs common to the design of any website considering that the former concerns mostly the implementation of accessibility conformance only on some specific items (such as images, PDF documents, multimedia pieces, etc.). Such extra-costs have been measured in terms of estimated number of workdays needed, to which we have applied country specific fees and cost of labour (Table 58). We did so by interviewing web accessibility experts in order to estimate, in hours of work (e.g. 8 hours = 1 working day), the extra effort that web developers have to make to render specific elements of a website accessible. This method eliminates the bias of considering the price charged by web developers, which have a huge variance depending on:

1. The profile of the organisation (e.g. an NGO vs. a private Web Accessibility consultancy),
2. The countries where they are based. It is reasonable to assume that the efforts in terms of hours of work needed remain the same across countries. What will change are the fees depending on each country market dynamic[[41]](#footnote-41).

At any rate our BCT Micro is flexible and can be easily adapted to each peculiar situation.

* 1. Costs

Whereas certain elements of web design and production are common to both accessible and non-accessible website, our field work confirmed that in the very short term (that is before web accessibility is mainstreamed) introducing web accessibility entails some extra costs such as: more dedicated personnel, training web department staff about accessibility, evaluating and certifying the accessibility of the website, etc. Following the WCAG 2.0, we have distinguished

First between:

* **Informative website**: only provides static information
* **Interactive website**: it has fora, forms, document downloading, etc.
* **Transactional / Multimedia website**: it has multimedia contents, flash, PDFs, online shopping, eGovernment, eHealth, eBanking, etc.

Then between:

* **Initial costs** (comprised by all work done in order to have the website accessible for the first time)
* **On-going costs** (running costs which have to be paid annually, derived from maintaining accessibility over time).

Below the different cost items identified are listed with a numbering reflecting exactly how they are presented in the interactive excel tool:

* **Skills development:** incorporating accessibility into website design requires learning web accessibility procedures and how to apply and maintain them. This implies[[42]](#footnote-42)::
  + **Direct cost of training:** the cash paid directly for training;
  + **Time away from work:** the training requires employees to be out of their daily activities;
  + **Learning process:** during skills development there is initially an increase in development and testing time because using new skills is often slower. In addition, organisations that move to different technologies in an effort to improve accessibility might incur training costs on the new technologies. Among other caveats, the Consortium has assumed that this cost category includes the cost of preparing and giving web accessibility training (3 types of courses, depending on the complexity of their contents) plus the learning material for the trainees. However, opportunity costs for employees absent from their desks have not been taken into account (this is part of the risk self-assessment to be made by respondents after using the BCT Micro).

Next within the overall area “developing technology”[[43]](#footnote-43) the following three categories of costs can be identified:

* **Design, programming and content production**[[44]](#footnote-44)**:**This cost depends on the type of website (informative, interactive and transactional), as well as the elements comprising the website**:**
  + Number of pages
  + Number of templates
  + Metadata
  + Images
  + Headings
  + Content table
  + Forms (simple, complex…)
  + Transactional processes
  + PDF (simple, average, complex)
  + Multimedia (simple, average, complex)
* **Accessibility assessment and first certification:** As indicated by the W3C[[45]](#footnote-45): “assessing (auditing or evaluating) website accessibility is a common initial cost. The assessment cost is either a direct expense if using a service outside the organisation, or a personnel cost if using internal resources.” This cost depends on the type of website (informative, interactive and transactional), as well as the number of pages to be assessed and certified.
* **Incorporating web accessibility procedures into web management:** As indicated by the W3C[[46]](#footnote-46): “Incorporating accessibility into protocols and procedures, such as quality assurance (QA) testing and usability evaluation, takes personnel time”. This cost depends on the type of website (informative, interactive and transactional).
* Concerning **on-going costs**, accessibility would need *Additional testing and certification maintenance[[47]](#footnote-47)*, this cost depends on the type of website (informative, interactive and transactional), as well as the number of pages to be assessed and certified.

The figure below present our cost methodology, with the variables involved in each category and the relationships among them.

Figure 11: Cost in Business Case Tool v.3.0 Simplified Structure

The figure shows:
Number of working days and fee per working day (of both web team and external consultants) make up the web accessibility extra costs. The ongoing costs of accessibility can be divided into assessment and certification, both can be described at informative interactive and transactional. 
However, the initial costs of extra web accessibility costs can be divided into (1) training and skills development which involves holding an accessibility workshop and learning material (2) design, programming and content production  which can be informative metadata, images, headings, etc., interactive, informative content, or transactional, informative content, multimedia, PDFs, etc. (3) accessibility assessment and 1st certification and (4) incorporating web accessibility procedures into web management. 

Source: Study Consortium’s Partners elaboration

In order to determine and quantify all the cost items included above, we have interviewed several web accessibility experts and estimated the work time needed to render each element accessible of a given website. This time estimation is then multiplied by the organisation personnel cost for a web developer or for the daily fee charged by a web accessibility consultancy based in his or her own country. This amount has been also estimated and used in our aggregate quantification of costs, but users of our tools will be able to input their own estimates.

Adding up all these items, opportunely quantified and monetised, produces the measure of the extra costs attributable solely to implementing Web Accessibility. As said, this tool and the aggregate quantification of such extra costs is a unique contribution we made to the field. Nonetheless there are still elements that are complex and that will require further research to be fully accounted into the costing of web accessibility. These concerns the kind of technology used or the need of specific programming if the technology used is not accessible per se, and could not be quantified. Future research topics related to web accessibility costs include, for instance, the quantification of:

1. the cost of integrating technologies and tools,
2. the cost of upgrading technologies and tools,
3. additional development costs,
4. potential economies of scale derived from economies of learning (employees learn to do their job more efficiently, and as a consequence, developing process could be faster and less costly).

Details about each cost category are fully available directly in the interactive excel tool and we have also included them in for ease of reference in Annex 4.1 (§4.4).

* 1. Benefits

As documented earlier (see §5.1 and §5.2), the large majority of organisations analysed during our field-work do not track quantitative benefits derived from web accessibility, although the respondents were aware that these benefits exist and most of them declared that in their views, web accessibility benefits outweigh costs. Due to this lack of evidence about quantitative benefits, we decided to incorporate the most relevant benefits to the BCT Micro but in qualitative terms.

The list of benefits coincide to a large extent with the key aspects presented earlier (§0, and explained in full detail in §3.3.2 (of Annex 3.1). These are:

CSR and legal-related benefits

* Improvement in social responsibility and image
* Compliance with legislation

Human resources-related benefits

* + More effective recruitment process
  + Attracting new employees
  + Retaining senior employees
  + Increasing employees’ productivity

Financial-related benefits

* + Larger audience/reach
  + More online sales
  + More offline sales
  + Monetised efficiency gains from a more effective interaction or transactions (public administrations)
  + Cost savings from a channel switch from the face-to-face or telephone customer service to the online site

Technical-related benefits

* + Improvement in SEO ranking
  + Better download times
  + Enhanced usability and ease of use
  + Cost reduction from technical improvements:
  + Decreased personnel costs for site maintenance
  + Reduced Site Development
  + Decreased server capacity and costs ([reduce bandwidth use and server load](http://www.w3.org/WAI/bcase/tech.html#server))
  + Decreased costs for multiple format sites
  + Decreased costs for new technology upgrading
  + [Enable content on different configurations](http://www.w3.org/WAI/bcase/tech.html#repurpose)
  + [Better compatibility and interoperability with advanced web technologies](http://www.w3.org/WAI/bcase/tech.html#advanced)
  + Improve the overall quality of the website
  + Better web traffic metrics

Future research about benefits is needed and would require involving organisations willing to collaborate in order to provide web metrics (before and after implementing web accessibility), developing a common methodology to measure web accessibility impacts (which web metrics and other indicators can be monitored) and creating more awareness among organisations and society as a whole.

* 1. How to use the interactive tool and final considerations

The excel-based interactive BCT Micro is user friendly, simple to use and its components reflect the various items discussed so far:

1. Training and skills development
2. Design, programming and content production
3. Accessibility assessment and first certification
4. Incorporating web accessibility procedures into web management
5. On-going annual costs

To make these calculations it is sufficient that the respondent open the spreadsheet and answer the questions included in the “Please answer these questions” sheet, either selecting the preferred option from a list or typing a number (if the respondent intends to input his/her own data). It is important to mention that some technical data are needed (number of pages, templates, forms, etc.), because the aim of this set of questions is to determine the profile and complexity of the website and its contents. Once this data has been selected and/or introduced, respondents can check the “Results” sheet, where a detailed breakdown of the extra cost for implanting web accessibility is presented, including different cost categories. This breakdown is presented in terms of working days as well as in euro amounts (respondents are asked to provide their internal cost per working day to give a better estimation). Benefits have also been included in the “Results” sheet in qualitative terms (due to the impossibility to quantify them). The rest of the sheets contained in the spread sheet are internal calculations for estimating each cost category included in the “Results” sheet.

The final version of the BCT Micro presented here incorporates the feedback from experts plus the discussions held in the Final Workshop, where the tool was presented and tested. Needless to say there are still a number of open issues mentioned during the workshop that will need to be addressed in the future, possibly as a result of the usage of this tool by practitioners. These include, for instance, the following:

* Is it possible to isolate web accessibility cost from the whole web development cost? As some participants outlined in the workshop, it is extremely difficult to isolate these costs because there are different issues to take into consideration: economies of scale (the effort is not the same when you make your first website accessible than when you do it for several times); expertise of developers inside the company on web accessibility; learning curve etc.
* Is it more costly to redesign a website to make it accessible rather than implementing web accessibility from scratch? In order to answer this question, experts highlighted that extra variables could be taken into account in the business case tool. For instance, now as it is presented, all the transactions are equally considered but they should include some differences in the future, taking the calculations into account. As the tool is designed to include other parameters, they could be incorporated if there is further research on this topic.
* Are there economies of scale when rendering contents accessible such as PDFs, so the cost/effort would increase at a slower pace?
* Can this tool be used for companies to change their behaviour concerning accessibility? Yes, but it only measures the cost of accessibility and not the benefits that they will get for investing in accessibility. It could have included quantitative benefits (but as mentioned in previous sections it was not possible). Some experts were surprised that enterprises could invest in accessibility and not calculate the return on the investments. An expert from Netherlands added that these calculations at micro-level are very complex. From their experience in a survey they carried out for 80 companies, they tried to measure it by asking for the impact on the traffic of their site; if the switch of channels has decreased (if users go less from the web to phones); the complaints received, and other quality indicators. At the end, with the conclusions from the previous research from Tesco cases, etc., they concluded that it was difficult to get results and they received poor evidence on that.

1. Aggregate projections of cost and benefit

The main methodological principles and estimation procedures for the quantitative projections are illustrated in Annex 2.1 (§2.4), including the scenarios proposed (§2.4.1). The entire Annex 5.1 is devoted to illustrate in detail the statistical and literature sources used, as well as the procedures followed to quantify each of the selected key aspects. Therefore, in §7.1 we only report the final quantitative projections for each key aspect with minimal additional comments, in §7.2 we present the aggregated costs and benefits calculations, and in §7.3 we look at the findings from the perspective of the economics of innovation. Note that the results of the aggregate projections will be reviewed from the perspective of policy implications only in next Section 8. Finally, it is worth recalling that much of the quantitative projections have used as a starting baseline the total target of PwD and elderly people whose construction is discussed in full detail in Annex 1.1, as well as the BCT Macro version developed by the study team.

* 1. Snapshots of projections for each key aspect
     1. Increase in employment for PwD

In brief, the rationale for this item is that increased Web Accessibility (IWA) enables PwD to use the Internet more and better and acquire those skills that the relevant literature shows to be associated with higher chances of being employed (see §4.2 and 4.2.1)

Following the procedure illustrated in §5.3.1 of Annex 4, we have projected that the monetary value of the potential increase in employment of PwD as a result of IWA can range from a minimum of €143 million (scenario 1 reaching only 5% of the target) to a maximum of €112 billion (scenario 3 reaching 100% of the target), as illustrated in Table 8 and Table 9.

What seems a huge variability, in fact, clearly reflects the uncertainties always surrounding the introduction of a policy initiative. This uncertainty springs from two sources:

1. Intensity and pervasiveness of the policy;
2. Likelihood of reaching the target.

The first source refers to the amount of effort invested and to compliance with the policy decided at higher level on the side of those who should implement it. In the case of Web Accessibility this means how many countries, not only introduce legislative provisions, but are also capable to enforce them and ensure that public and private organisations comply with them and make all of their websites and online services accessible.

The second source points to the fact that very often even strong policy efforts do not manage to reach their target. In our domain even the most intensive and pervasive Web Accessibility policy may not reach all of PwD if they are not aware and/or motivated. This brings us again to stress the importance of the considerations on ‘Individual Functionings and ICT Appropriation’ contained in §4.1 and their implications in terms of the need for coordinated and joint policy action beyond simply making websites accessible.

Finally, the reader should recall that this exercise is conducted using a theory and empirically informed deterministic approach. This cannot, by using empirical data, analytically solve the above described uncertainty in a more granular and robust fashion. If we had longitudinal and cross-section data on all the variables considered and on the actual (and not assumed) policy treatment, then we could have run a sophisticated multivariate statistical analysis and presented one single correlation coefficient telling us: policy of IWA have increased employment for PwD by “X.X%”. We do not have these data so we are only framing in theoretical and empirical reasonable ways this uncertainty ex ante. (See Annex §2.1, for information about the methodology followed and §2.4.1 for the scenarios used).

Table 8: Impact of IWA on employment under different scenarios and targets reached (Target 5%)

| **Country** | **Scenario 1**  **(Target 5%)** | **Scenario 2**  **(Target 5%)** | **Scenario 3**  **(Target 5%)** |
| --- | --- | --- | --- |
| **BE** | 4.512.600 | 18.761.499 | 37.522.999 |
| **CZ** | 1.147.754 | 28.038.724 | 56.077.448 |
| **DK** | 2.851.238 | 79.164.771 | 158.329.541 |
| **DE** | 23.536.406 | 397.162.142 | 794.324.283 |
| **EE** | 60.512 | 2.849.661 | 5.699.323 |
| **IE** | 1.035.630 | 34.094.114 | 68.188.229 |
| **EL** | 1.233.307 | 20.012.623 | 40.025.246 |
| **ES** | 3.518.614 | 165.417.880 | 330.835.761 |
| **FR** | 33.331.213 | 527.014.339 | 1.054.028.678 |
| **IT** | 5.412.856 | 100.940.214 | 201.880.429 |
| **CY** | 174.685 | 3.240.645 | 6.481.289 |
| **LT** | 71.436 | 4.021.630 | 8.043.260 |
| **LU** | 114.454 | 1.095.668 | 2.191.335 |
| **HU** | 267.019 | 27.370.175 | 54.740.349 |
| **MT** | 32.796 | 807.293 | 1.614.586 |
| **NL** | 11.054.832 | 175.938.508 | 351.877.017 |
| **AT** | 1.703.966 | 24.447.217 | 48.894.433 |
| **PT** | 3.395.861 | 31.943.732 | 63.887.463 |
| **SI** | 630.061 | 7.557.385 | 15.114.770 |
| **SK** | 101.115 | 6.662.111 | 13.324.221 |
| **FI** | 3.980.997 | 66.450.898 | 132.901.797 |
| **SE** | 5.129.054 | 23.865.394 | 47.730.787 |
| **UK** | 35.430.853 | 970.384.841 | 1.940.769.683 |
| **RO** | 219.482 | 6.709.104 | 13.418.208 |
| **NO** | 3.684.728 | 76.980.715 | 153.961.431 |
| **EU** | **142.631.466** | **2.800.931.283** | **5.601.862.567** |

Source: Authors elaboration using LFS 2002 and Eurostat Structure of Earnings Survey. Figures shown in euros

Table 8 cont.: Impact of IWA on employment under different scenarios and targets reached (Target 25%)

| **Country** | **Scenario 1**  **(Target 25%)** | **Scenario 2**  **(Target 25%)** | **Scenario 3**  **(Target 25%)** |
| --- | --- | --- | --- |
| **BE** | 22.563.002 | 93.807.496 | 187.614.993 |
| **CZ** | 5.738.769 | 140.193.621 | 280.387.242 |
| **DK** | 14.256.189 | 395.823.853 | 791.647.705 |
| **DE** | 117.682.029 | 1.985.810.708 | 3.971.621.415 |
| **EE** | 302.560 | 14.248.307 | 28.496.615 |
| **IE** | 5.178.148 | 170.470.571 | 340.941.143 |
| **EL** | 6.166.534 | 100.063.116 | 200.126.232 |
| **ES** | 17.593.070 | 827.089.402 | 1.654.178.804 |
| **FR** | 166.656.063 | 2.635.071.696 | 5.270.143.392 |
| **IT** | 27.064.282 | 504.701.072 | 1.009.402.144 |
| **CY** | 873.427 | 16.203.223 | 32.406.447 |
| **LT** | 357.181 | 20.108.150 | 40.216.301 |
| **LU** | 572.269 | 5.478.338 | 10.956.676 |
| **HU** | 1.335.094 | 136.850.874 | 273.701.747 |
| **MT** | 163.978 | 4.036.464 | 8.072.929 |
| **NL** | 55.274.160 | 879.692.542 | 1.759.385.085 |
| **AT** | 8.519.828 | 122.236.084 | 244.472.167 |
| **PT** | 16.979.306 | 159.718.659 | 319.437.317 |
| **SI** | 3.150.304 | 37.786.924 | 75.573.848 |
| **SK** | 505.573 | 33.310.553 | 66.621.105 |
| **FI** | 19.904.987 | 332.254.492 | 664.508.985 |
| **SE** | 25.645.268 | 119.326.968 | 238.653.936 |
| **UK** | 177.154.263 | 4.851.924.206 | 9.703.848.413 |
| **RO** | 1.097.408 | 33.545.519 | 67.091.039 |
| **NO** | 18.423.638 | 384.903.577 | 769.807.155 |
| **EU** | **713.157.331** | **14.004.656.417** | **28.009.312.835** |

Source: Authors elaboration using LFS 2002 and Eurostat Structure of Earnings Survey. Figures shown in euros

Table 9: Impact of IWA on employment under different scenarios and targets reached (Target 50%)

| **Country** | **Scenario 1** | **Scenario 2** | **Scenario 3** |
| --- | --- | --- | --- |
| **BE** | 45.126.005 | 187.614.993 | 375.229.986 |
| **CZ** | 11.477.538 | 280.387.242 | 560.774.485 |
| **DK** | 28.512.378 | 791.647.705 | 1.583.295.410 |
| **DE** | 235.364.059 | 3.971.621.415 | 7.943.242.831 |
| **EE** | 605.121 | 28.496.615 | 56.993.229 |
| **IE** | 10.356.296 | 340.941.143 | 681.882.285 |
| **EL** | 12.333.068 | 200.126.232 | 400.252.464 |
| **ES** | 35.186.141 | 1.654.178.804 | 3.308.357.608 |
| **FR** | 333.312.126 | 5.270.143.392 | 10.540.286.784 |
| **IT** | 54.128.563 | 1.009.402.144 | 2.018.804.289 |
| **CY** | 1.746.854 | 32.406.447 | 64.812.894 |
| **LT** | 714.361 | 40.216.301 | 80.432.601 |
| **LU** | 1.144.539 | 10.956.676 | 21.913.352 |
| **HU** | 2.670.188 | 273.701.747 | 547.403.495 |
| **MT** | 327.956 | 8.072.929 | 16.145.858 |
| **NL** | 110.548.319 | 1.759.385.085 | 3.518.770.169 |
| **AT** | 17.039.655 | 244.472.167 | 488.944.335 |
| **PT** | 33.958.613 | 319.437.317 | 638.874.635 |
| **SI** | 6.300.608 | 75.573.848 | 151.147.695 |
| **SK** | 1.011.146 | 66.621.105 | 133.242.211 |
| **FI** | 39.809.974 | 664.508.985 | 1.329.017.970 |
| **SE** | 51.290.536 | 238.653.936 | 477.307.871 |
| **UK** | 354.308.526 | 9.703.848.413 | 19.407.696.826 |
| **RO** | 2.194.817 | 67.091.039 | 134.182.077 |
| **NO** | 36.847.276 | 769.807.155 | 1.539.614.310 |
| **EU** | **1.426.314.661** | **28.009.312.835** | **56.018.625.669** |

Source: Authors elaboration using LFS 2002 and Eurostat Structure of Earnings Survey. Figures shown in euros

Table 9 cont.: Impact of IWA on employment under different scenarios and targets reached (Target 100%)

| **Country** | **Scenario 1** | **Scenario 2** | **Scenario 3** |
| --- | --- | --- | --- |
| **BE** | 90.252.010 | 375.229.986 | 750.459.971 |
| **CZ** | 22.955.076 | 560.774.485 | 1.121.548.970 |
| **DK** | 57.024.755 | 1.583.295.410 | 3.166.590.820 |
| **DE** | 470.728.117 | 7.943.242.831 | 15.886.485.661 |
| **EE** | 1.210.241 | 56.993.229 | 113.986.458 |
| **IE** | 20.712.593 | 681.882.285 | 1.363.764.571 |
| **EL** | 24.666.137 | 400.252.464 | 800.504.929 |
| **ES** | 70.372.281 | 3.308.357.608 | 6.616.715.217 |
| **FR** | 666.624.252 | 10.540.286.784 | 21.080.573.568 |
| **IT** | 108.257.127 | 2.018.804.289 | 4.037.608.577 |
| **CY** | 3.493.707 | 64.812.894 | 129.625.787 |
| **LT** | 1.428.722 | 80.432.601 | 160.865.203 |
| **LU** | 2.289.077 | 21.913.352 | 43.826.705 |
| **HU** | 5.340.377 | 547.403.495 | 1.094.806.990 |
| **MT** | 655.911 | 16.145.858 | 32.291.715 |
| **NL** | 221.096.639 | 3.518.770.169 | 7.037.540.338 |
| **AT** | 34.079.310 | 488.944.335 | 977.888.669 |
| **PT** | 67.917.226 | 638.874.635 | 1.277.749.269 |
| **SI** | 12.601.217 | 151.147.695 | 302.295.391 |
| **SK** | 2.022.291 | 133.242.211 | 266.484.422 |
| **FI** | 79.619.949 | 1.329.017.970 | 2.658.035.939 |
| **SE** | 102.581.071 | 477.307.871 | 954.615.743 |
| **UK** | 708.617.051 | 19.407.696.826 | 38.815.393.651 |
| **RO** | 4.389.634 | 134.182.077 | 268.364.154 |
| **NO** | 73.694.551 | 1.539.614.310 | 3.079.228.619 |
| **EU** | 2.852.629.322 | 56.018.625.669 | 112.037.251.338 |

Source: Authors elaboration using LFS 2002 and Eurostat Structure of Earnings Survey. Figures shown in euros

* + 1. Increase in wage levels for PwD

In brief, the rationale for this item is that IWA enables PwD to use the Internet more and better and increase their digital skills and productivity. The relevant economic literature, in fact, shows that digital skills are associated with higher chances of being employed and of achieving higher wage levels (see §4.2 and 4.2.1).

Following the procedure illustrated in §5.3.2 of Annex 5.1, we have projected that the monetary value of the potential increase in wage levels for PwD as a result of IWA can range from a minimum of €3.5 billion (scenario 1 reaching only 5% of the target) to a maximum of €143 billion (scenario 3 reaching 100% of the target) as illustrated in Table 10 and Table 11 below.

As for the variability the same considerations in the previous paragraph apply here, with one major difference. The variability is still high, but not in the same order of magnitude as for employment. Even under the lowest scenario and target reached, the gain is still in the order of billions. The reason is straightforward: here we started from a baseline pool of individuals who, despite being seriously restricted, are employed. They already earn a salary (not always at the bottom of the structure of earnings) and, thus, the increased capacities and productivity that IWA can offer them has a more direct and sizeable impact.

Table 10: Impact of IWA on wages under different scenarios and targets reached (Target 5%)

| **Country** | **Scenario 1**  **(Target 5%)** | **Scenario 2**  **(Target 5%)** | **Scenario 3**  **(Target 5%)** |
| --- | --- | --- | --- |
| **BE** | 50.763.474 | 105.271.360 | 101.526.948 |
| **CZ** | 27.103.733 | 50.648.736 | 54.207.466 |
| **DK** | 46.225.420 | 114.550.668 | 92.450.839 |
| **DE** | 592.592.051 | 996.836.039 | 1.185.184.103 |
| **EE** | 6.747.574 | 3.831.274 | 13.495.148 |
| **IE** | 75.938.760 | 53.541.517 | 151.877.519 |
| **EL** | 29.828.962 | 56.243.729 | 59.657.925 |
| **ES** | 173.579.211 | 271.071.783 | 347.158.422 |
| **FR** | 934.793.151 | 992.354.214 | 1.869.586.303 |
| **IT** | 109.037.077 | 313.379.275 | 218.074.154 |
| **CY** | 3.878.553 | 7.204.620 | 7.757.107 |
| **LT** | 3.567.080 | 5.602.311 | 7.134.159 |
| **LU** | 2.424.637 | 3.569.233 | 4.849.273 |
| **HU** | 24.110.773 | 34.613.799 | 48.221.546 |
| **MT** | 997.316 | 1.625.609 | 1.994.633 |
| **NL** | 164.414.201 | 273.836.668 | 328.828.403 |
| **AT** | 74.422.172 | 76.530.403 | 148.844.344 |
| **PT** | 75.574.759 | 103.653.546 | 151.149.518 |
| **SI** | 12.856.852 | 21.212.263 | 25.713.704 |
| **SK** | 6.159.374 | 10.684.399 | 12.318.748 |
| **FI** | 72.148.646 | 130.538.819 | 144.297.291 |
| **SE** | 188.445.754 | 108.773.206 | 376.891.507 |
| **UK** | 871.579.639 | 1.352.795.751 | 1.743.159.279 |
| **RO** | 10.131.439 | 18.338.884 | 20.262.879 |
| **NO** | 113.842.469 | 112.873.264 | 227.684.938 |
| **EU** | **3.593.295.871** | **5.219.581.373** | **7.342.326.158** |

Source: Authors elaboration using LFS 2002 and Eurostat Structure of Earnings Survey. Figures shown in euros.Table 10 cont.: Impact of IWA on wages under different scenarios and targets reached (Target 25%)

| **Country** | **Scenario 1**  **(Target 25%)** | **Scenario 2**  **(Target 25%)** | **Scenario 3**  **(Target 25%)** |
| --- | --- | --- | --- |
| **BE** | 253.817.371 | 526.356.802 | 507.634.742 |
| **CZ** | 135.518.666 | 253.243.681 | 271.037.332 |
| **DK** | 231.127.098 | 572.753.342 | 462.254.195 |
| **DE** | 2.962.960.257 | 4.984.180.197 | 5.925.920.514 |
| **EE** | 33.737.870 | 19.156.371 | 67.475.741 |
| **IE** | 379.693.799 | 267.707.584 | 759.387.597 |
| **EL** | 149.144.812 | 281.218.644 | 298.289.624 |
| **ES** | 867.896.056 | 1.355.358.916 | 1.735.792.111 |
| **FR** | 4.673.965.757 | 4.961.771.070 | 9.347.931.514 |
| **IT** | 545.185.385 | 1.566.896.376 | 1.090.370.771 |
| **CY** | 19.392.767 | 36.023.101 | 38.785.534 |
| **LT** | 17.835.398 | 28.011.557 | 35.670.797 |
| **LU** | 12.123.183 | 17.846.165 | 24.246.365 |
| **HU** | 120.553.866 | 173.068.994 | 241.107.732 |
| **MT** | 4.986.582 | 8.128.044 | 9.973.164 |
| **NL** | 822.071.006 | 1.369.183.342 | 1.644.142.013 |
| **AT** | 372.110.860 | 382.652.017 | 744.221.721 |
| **PT** | 377.873.794 | 518.267.729 | 755.747.588 |
| **SI** | 64.284.261 | 106.061.317 | 128.568.522 |
| **SK** | 30.796.869 | 53.421.995 | 61.593.739 |
| **FI** | 360.743.228 | 652.694.094 | 721.486.456 |
| **SE** | 942.228.768 | 543.866.030 | 1.884.457.537 |
| **UK** | 4.357.898.197 | 6.763.978.756 | 8.715.796.395 |
| **RO** | 50.657.197 | 91.694.420 | 101.314.394 |
| **NO** | 569.212.345 | 564.366.320 | 1.138.424.690 |
| **EU** | **18.355.815.394** | **26.097.906.865** | **36.711.630.788** |

Source: Authors elaboration using LFS 2002 and Eurostat Structure of Earnings Survey. Figures shown in euros.

Table 11: Impact of IWA on wages under different scenarios and targets reached (Target 50%)

|  | **Scenario 1**  **(Target 50%)** | **Scenario 2**  **(Target 50%)** | **Scenario 3**  **(Target 50%)** |
| --- | --- | --- | --- |
| **BE** | 507.634.742 | 1.052.713.604 | 1.015.269.485 |
| **CZ** | 271.037.332 | 506.487.361 | 542.074.665 |
| **DK** | 462.254.195 | 1.145.506.683 | 924.508.391 |
| **DE** | 5.925.920.514 | 9.968.360.394 | 11.851.841.027 |
| **EE** | 67.475.741 | 38.312.742 | 134.951.482 |
| **IE** | 759.387.597 | 535.415.168 | 1.518.775.194 |
| **EL** | 298.289.624 | 562.437.287 | 596.579.249 |
| **ES** | 1.735.792.111 | 2.710.717.833 | 3.471.584.222 |
| **FR** | 9.347.931.514 | 9.923.542.141 | 18.695.863.029 |
| **IT** | 1.090.370.771 | 3.133.792.752 | 2.180.741.541 |
| **CY** | 38.785.534 | 72.046.201 | 77.571.069 |
| **LT** | 35.670.797 | 56.023.114 | 71.341.593 |
| **LU** | 24.246.365 | 35.692.330 | 48.492.731 |
| **HU** | 241.107.732 | 346.137.988 | 482.215.464 |
| **MT** | 9.973.164 | 16.256.087 | 19.946.328 |
| **NL** | 1.644.142.013 | 2.738.366.685 | 3.288.284.025 |
| **AT** | 744.221.721 | 765.304.034 | 1.488.443.441 |
| **PT** | 755.747.588 | 1.036.535.459 | 1.511.495.175 |
| **SI** | 128.568.522 | 212.122.634 | 257.137.045 |
| **SK** | 61.593.739 | 106.843.990 | 123.187.477 |
| **FI** | 721.486.456 | 1.305.388.189 | 1.442.972.911 |
| **SE** | 1.884.457.537 | 1.087.732.061 | 3.768.915.073 |
| **UK** | 8.715.796.395 | 13.527.957.512 | 17.431.592.790 |
| **RO** | 101.314.394 | 183.388.840 | 202.628.789 |
| **NO** | 1.138.424.690 | 1.128.732.641 | 2.276.849.381 |
| **EU** | **36.711.630.788** | **52.195.813.730** | **73.423.261.577** |

Source: Authors elaboration using LFS 2002 and Eurostat Structure of Earnings Survey. Figures shown in euros.Table 11 cont.: Impact of IWA on wages under different scenarios and targets reached (Target 100%)

|  | **Scenario 1**  **(Target 100%)** | **Scenario 2**  **(Target 100%)** | **Scenario 3**  **(Target 100%)** |
| --- | --- | --- | --- |
| **BE** | 1.015.269.485 | 2.105.427.208 | 2.030.538.970 |
| **CZ** | 542.074.665 | 1.012.974.723 | 1.084.149.329 |
| **DK** | 924.508.391 | 2.291.013.367 | 1.849.016.782 |
| **DE** | 11.851.841.027 | 19.936.720.789 | 23.703.682.055 |
| **EE** | 134.951.482 | 76.625.485 | 269.902.964 |
| **IE** | 1.518.775.194 | 1.070.830.336 | 3.037.550.389 |
| **EL** | 596.579.249 | 1.124.874.574 | 1.193.158.497 |
| **ES** | 3.471.584.222 | 5.421.435.665 | 6.943.168.444 |
| **FR** | 18.695.863.029 | 19.847.084.282 | 37.391.726.058 |
| **IT** | 2.180.741.541 | 6.267.585.505 | 4.361.483.082 |
| **CY** | 77.571.069 | 144.092.403 | 155.142.137 |
| **LT** | 71.341.593 | 112.046.228 | 142.683.186 |
| **LU** | 48.492.731 | 71.384.659 | 96.985.462 |
| **HU** | 482.215.464 | 692.275.976 | 964.430.929 |
| **MT** | 19.946.328 | 32.512.174 | 39.892.655 |
| **NL** | 3.288.284.025 | 5.476.733.370 | 6.576.568.050 |
| **AT** | 1.488.443.441 | 1.530.608.068 | 2.976.886.883 |
| **PT** | 1.511.495.175 | 2.073.070.918 | 3.022.990.351 |
| **SI** | 257.137.045 | 424.245.267 | 514.274.090 |
| **SK** | 123.187.477 | 213.687.980 | 246.374.954 |
| **FI** | 1.442.972.911 | 2.610.776.378 | 2.885.945.822 |
| **SE** | 3.768.915.073 | 2.175.464.121 | 7.537.830.146 |
| **UK** | 17.431.592.790 | 27.055.915.023 | 34.863.185.580 |
| **RO** | 202.628.789 | 366.777.680 | 405.257.578 |
| **NO** | 2.276.849.381 | 2.257.465.281 | 4.553.698.761 |
| **EU** | **73.423.261.577** | **104.391.627.460** | **146.846.523.154** |

Source: Authors elaboration using LFS 2002 and Eurostat Structure of Earnings Survey. Figures shown in euros.

* + 1. Increase in health utility (QALY) for PwD

In brief, the rationale for this item is that IWA enables PwD to have better access to health related information, services, and other functionalities, which can contribute to reduce the burden of their disabilities and, thus, improving their health related quality of life (see §4.2.1 and §5.3.3)

Following the procedure illustrated in §5.3.3 of Annex 5.1, we have projected that the monetary value of the potential increase in QALY for PwD as a result of IWA can range from a minimum of €754 million (reaching only 5% of the target) to a maximum of €151 billion (reaching 100% of the target) as illustrated in Table 12 and Table 13.

As for the variability the same considerations done in the previous paragraphs apply here, with one additional specification. Health related quality of life measures such as QALY and DALY are not far-fetched inventions of health economists. They integrate objective clinical knowledge on the constraining impacts of a disease or disability, survey by asking professionals their views, and, last but not least, survey to understand the subjectively perceived burden by those affected by the disease or disability. The assumption we made is a reasonable one from a theoretical perspective, as we can exemplify reasoning on the case of a person with disability. The disability weights are constructed factoring in many elements, such as the fact that an individual may not easily move, or cannot take advantage of available cultural and entertainment possibilities, if not supported. Naturally support can help, but this reduces the sense of autonomy and contributes to the perception of the weight of the disability on the Activity of Daily Life. Next we assumed that, with IWA, PwD will be able to do more activities (e.g. get a document online through eGovernment services) alone and that this in turn would increase the sense of autonomy and reduce the subjective perception of the burden of disability. What this reasoning is missing naturally are empirical surveys asking questions about these issues to PwD that could be added in the calculation of QALY and of disability weights. This was beyond the scope of this study (to construct this lacking data) and we could therefore proceed only by using reasonable and very conservative assumptions.

Table 12: Impact of IWA on Health Utility under different scenarios and targets reached (Target 5%)

| **Country** | **Scenario 1**  **(Target 5%)** | **Scenario 2**  **(Target 5%)** | **Scenario 3**  **(Target 5%)** |
| --- | --- | --- | --- |
| **BE** | 10.183.917 | 50.919.586 | 101.839.172 |
| **CZ** | 18.830.563 | 94.152.816 | 188.305.632 |
| **DK** | 11.033.208 | 55.166.040 | 110.332.079 |
| **DE** | 68.107.309 | 340.536.546 | 681.073.092 |
| **EE** | 2.478.569 | 12.392.843 | 24.785.687 |
| **IE** | 3.222.355 | 16.111.773 | 32.223.546 |
| **EL** | 5.717.776 | 28.588.880 | 57.177.761 |
| **ES** | 24.411.795 | 122.058.973 | 244.117.946 |
| **FR** | 214.959.469 | 1.074.797.346 | 2.149.594.693 |
| **IT** | 16.629.689 | 83.148.446 | 166.296.892 |
| **CY** | 890.889 | 4.454.447 | 8.908.895 |
| **LT** | 20.472.316 | 102.361.581 | 204.723.161 |
| **LU** | 202.981 | 1.014.903 | 2.029.805 |
| **HU** | 12.091.214 | 60.456.071 | 120.912.141 |
| **MT** | 161.754 | 808.771 | 1.617.541 |
| **NL** | 41.467.931 | 207.339.657 | 414.679.315 |
| **AT** | 5.497.713 | 27.488.566 | 54.977.132 |
| **PT** | 24.523.964 | 122.619.820 | 245.239.641 |
| **SI** | 5.224.161 | 26.120.804 | 52.241.608 |
| **SK** | 3.004.791 | 15.023.954 | 30.047.907 |
| **FI** | 22.510.627 | 112.553.133 | 225.106.265 |
| **SE** | 12.784.961 | 63.924.805 | 127.849.610 |
| **UK** | 214.652.504 | 1.073.262.521 | 2.146.525.042 |
| **RO** | 6.116.228 | 30.581.142 | 61.162.283 |
| **NO** | 9.036.808 | 45.184.041 | 90.368.083 |
| **EU** | **754.213.493** | **3.771.067.465** | **7.542.134.930** |

Source: Authors elaboration using LFS 2002, EU-SILC, and WHO Global Burden of Disease Update, 2004. Figures shown in euros.Table 12 cont.: Impact of IWA on Health Utility under different scenarios and targets reached (Target 25%)

| **Country** | **Scenario 1**  **(Target 25%)** | **Scenario 2**  **(Target 25%)** | **Scenario 3**  **(Target 25%)** |
| --- | --- | --- | --- |
| **BE** | 50.919.586 | 254.597.931 | 509.195.861 |
| **CZ** | 94.152.816 | 470.764.080 | 941.528.160 |
| **DK** | 55.166.040 | 275.830.198 | 551.660.396 |
| **DE** | 340.536.546 | 1.702.682.730 | 3.405.365.460 |
| **EE** | 12.392.843 | 61.964.217 | 123.928.435 |
| **IE** | 16.111.773 | 80.558.866 | 161.117.732 |
| **EL** | 28.588.880 | 142.944.402 | 285.888.805 |
| **ES** | 122.058.973 | 610.294.866 | 1.220.589.732 |
| **FR** | 1.074.797.346 | 5.373.986.732 | 10.747.973.464 |
| **IT** | 83.148.446 | 415.742.230 | 831.484.461 |
| **CY** | 4.454.447 | 22.272.237 | 44.544.473 |
| **LT** | 102.361.581 | 511.807.903 | 1.023.615.805 |
| **LU** | 1.014.903 | 5.074.513 | 10.149.025 |
| **HU** | 60.456.071 | 302.280.354 | 604.560.707 |
| **MT** | 808.771 | 4.043.853 | 8.087.706 |
| **NL** | 207.339.657 | 1.036.698.287 | 2.073.396.575 |
| **AT** | 27.488.566 | 137.442.831 | 274.885.662 |
| **PT** | 122.619.820 | 613.099.101 | 1.226.198.203 |
| **SI** | 26.120.804 | 130.604.019 | 261.208.038 |
| **SK** | 15.023.954 | 75.119.768 | 150.239.536 |
| **FI** | 112.553.133 | 562.765.663 | 1.125.531.326 |
| **SE** | 63.924.805 | 319.624.025 | 639.248.049 |
| **UK** | 1.073.262.521 | 5.366.312.606 | 10.732.625.211 |
| **RO** | 30.581.142 | 152.905.708 | 305.811.415 |
| **NO** | 45.184.041 | 225.920.207 | 451.840.414 |
| **EU** | **3.771.067.465** | **18.855.337.325** | **37.710.674.651** |

Source: Authors elaboration using LFS 2002, EU-SILC, and WHO Global Burden of Disease Update, 2004. Figures shown in euros.

Table 13: Impact of IWA on Health Utility under different scenarios and targets reached (Target 50%)

| **Country** | **Scenario 1**  **(Target 50%)** | **Scenario 2**  **(Target 50%)** | **Scenario 3**  **(Target 50%)** |
| --- | --- | --- | --- |
| **BE** | 101.839.172 | 509.195.861 | 1.018.391.722 |
| **CZ** | 188.305.632 | 941.528.160 | 1.883.056.320 |
| **DK** | 110.332.079 | 551.660.396 | 1.103.320.791 |
| **DE** | 681.073.092 | 3.405.365.460 | 6.810.730.920 |
| **EE** | 24.785.687 | 123.928.435 | 247.856.870 |
| **IE** | 32.223.546 | 161.117.732 | 322.235.465 |
| **EL** | 57.177.761 | 285.888.805 | 571.777.609 |
| **ES** | 244.117.946 | 1.220.589.732 | 2.441.179.463 |
| **FR** | 2.149.594.693 | 10.747.973.464 | 21.495.946.928 |
| **IT** | 166.296.892 | 831.484.461 | 1.662.968.922 |
| **CY** | 8.908.895 | 44.544.473 | 89.088.946 |
| **LT** | 204.723.161 | 1.023.615.805 | 2.047.231.611 |
| **LU** | 2.029.805 | 10.149.025 | 20.298.051 |
| **HU** | 120.912.141 | 604.560.707 | 1.209.121.414 |
| **MT** | 1.617.541 | 8.087.706 | 16.175.412 |
| **NL** | 414.679.315 | 2.073.396.575 | 4.146.793.149 |
| **AT** | 54.977.132 | 274.885.662 | 549.771.324 |
| **PT** | 245.239.641 | 1.226.198.203 | 2.452.396.406 |
| **SI** | 52.241.608 | 261.208.038 | 522.416.076 |
| **SK** | 30.047.907 | 150.239.536 | 300.479.072 |
| **FI** | 225.106.265 | 1.125.531.326 | 2.251.062.652 |
| **SE** | 127.849.610 | 639.248.049 | 1.278.496.098 |
| **UK** | 2.146.525.042 | 10.732.625.211 | 21.465.250.423 |
| **RO** | 61.162.283 | 305.811.415 | 611.622.830 |
| **NO** | 90.368.083 | 451.840.414 | 903.680.827 |
| **EU** | **7.542.134.930** | **37.710.674.651** | **75.421.349.301** |

Source: Authors elaboration using LFS 2002, EU-SILC, and WHO Global Burden of Disease Update, 2004. Figures shown in euros.Table 13 cont.: Impact of IWA on Health Utility under different scenarios and targets reached (Target 100%)

| **Country** | **Scenario 1**  **(Target 100%)** | **Scenario 2**  **(Target 100%)** | **Scenario 3**  **(Target 100%)** |
| --- | --- | --- | --- |
| **BE** | 203.678.344 | 1.018.391.722 | 2.036.783.444 |
| **CZ** | 376.611.264 | 1.883.056.320 | 3.766.112.640 |
| **DK** | 220.664.158 | 1.103.320.791 | 2.206.641.583 |
| **DE** | 1.362.146.184 | 6.810.730.920 | 13.621.461.841 |
| **EE** | 49.571.374 | 247.856.870 | 495.713.740 |
| **IE** | 64.447.093 | 322.235.465 | 644.470.929 |
| **EL** | 114.355.522 | 571.777.609 | 1.143.555.218 |
| **ES** | 488.235.893 | 2.441.179.463 | 4.882.358.926 |
| **FR** | 4.299.189.386 | 21.495.946.928 | 42.991.893.856 |
| **IT** | 332.593.784 | 1.662.968.922 | 3.325.937.844 |
| **CY** | 17.817.789 | 89.088.946 | 178.177.892 |
| **LT** | 409.446.322 | 2.047.231.611 | 4.094.463.222 |
| **LU** | 4.059.610 | 20.298.051 | 40.596.102 |
| **HU** | 241.824.283 | 1.209.121.414 | 2.418.242.829 |
| **MT** | 3.235.082 | 16.175.412 | 32.350.823 |
| **NL** | 829.358.630 | 4.146.793.149 | 8.293.586.298 |
| **AT** | 109.954.265 | 549.771.324 | 1.099.542.648 |
| **PT** | 490.479.281 | 2.452.396.406 | 4.904.792.811 |
| **SI** | 104.483.215 | 522.416.076 | 1.044.832.152 |
| **SK** | 60.095.814 | 300.479.072 | 600.958.145 |
| **FI** | 450.212.530 | 2.251.062.652 | 4.502.125.304 |
| **SE** | 255.699.220 | 1.278.496.098 | 2.556.992.197 |
| **UK** | 4.293.050.085 | 21.465.250.423 | 42.930.500.845 |
| **RO** | 122.324.566 | 611.622.830 | 1.223.245.660 |
| **NO** | 180.736.165 | 903.680.827 | 1.807.361.654 |
| **EU** | **15.084.269.860** | **75.421.349.301** | **150.842.698.603** |

Source: Authors elaboration using LFS 2002, EU-SILC, and WHO Global Burden of Disease Update, 2004. Figures shown in euros.

* + 1. eCommerce and eBanking gains for PwD

In brief, the rationale for this item is that IWA enables PwD to take advantage of the convenience and lower prices and/or costs offered by eCommerce and eBanking (see § 4.2.1and § 5.3.4 ).Following the procedure illustrated in § 5.3.4 of Annex 5.1, we have projected that the monetary value of the potential eCommerce gain ranges from a minimum of €63 million (reaching only 5% of the target) to a maximum of €1.2 billion (reaching 100% of the target), and those for Internet banking from a minimum of €19 million (reaching only 5% of the target) to a maximum of €380 million (reaching 100% of the target), as illustrated in Table 14 and Table 15.

Table 14: Impact of IWA on eCommerce gains under different target reached

| **Country** | **Target 5%** | **Target 25%** | **Target 50%** | **Target 100%** |
| --- | --- | --- | --- | --- |
| **BE** | 754.288 | 3.771.440 | 7.542.879 | 15.085.758 |
| **CZ** | 1.698.017 | 8.490.084 | 16.980.169 | 33.960.337 |
| **DK** | 1.055.754 | 5.278.771 | 10.557.541 | 21.115.083 |
| **DE** | 7.998.213 | 39.991.065 | 79.982.131 | 159.964.262 |
| **EE** | 247.010 | 1.235.050 | 2.470.100 | 4.940.199 |
| **IE** | 901.078 | 4.505.388 | 9.010.776 | 18.021.552 |
| **EL** | 188.799 | 943.997 | 1.887.994 | 3.775.988 |
| **ES** | 6.253.043 | 31.265.215 | 62.530.430 | 125.060.860 |
| **FR** | 13.191.797 | 65.958.984 | 131.917.968 | 263.835.935 |
| **IT** | 887.683 | 4.438.416 | 8.876.833 | 17.753.666 |
| **CY** | 13.453 | 67.263 | 134.525 | 269.050 |
| **LT** | 465.088 | 2.325.438 | 4.650.876 | 9.301.751 |
| **LU** | 31.873 | 159.365 | 318.731 | 637.462 |
| **HU** | 882.376 | 4.411.878 | 8.823.756 | 17.647.512 |
| **MT** | 43.253 | 216.265 | 432.531 | 865.061 |
| **NL** | 3.064.025 | 15.320.126 | 30.640.251 | 61.280.502 |
| **AT** | 557.786 | 2.788.930 | 5.577.860 | 11.155.720 |
| **PT** | 1.741.697 | 8.708.485 | 17.416.971 | 34.833.942 |
| **SI** | 597.807 | 2.989.036 | 5.978.073 | 11.956.145 |
| **SK** | 144.027 | 720.137 | 1.440.274 | 2.880.548 |
| **FI** | 1.718.509 | 8.592.547 | 17.185.093 | 34.370.187 |
| **SE** | 1.212.109 | 6.060.545 | 12.121.091 | 24.242.182 |
| **UK** | 17.880.997 | 89.404.987 | 178.809.974 | 357.619.949 |
| **RO** | 412.907 | 2.064.533 | 4.129.066 | 8.258.132 |
| **NO** | 1.493.900 | 7.469.498 | 14.938.996 | 29.877.992 |
| **EU** | **63.435.489** | **317.177.444** | **634.354.887** | **1.268.709.774** |

Source: Authors elaboration on Eurobarometer 2002, Eurostat households survey on Internet and eCommerce usage. Figure shown in euros.

Table 15: Impact of IWA on Internet Banking gains under different target reached

| **Country** | **Target 5%** | **Target 25%** | **Target 50%** | **Target 100%** |
| --- | --- | --- | --- | --- |
| **BE** | 228.253 | 1.141.264 | 2.282.529 | 4.565.057 |
| **CZ** | 513.832 | 2.569.160 | 5.138.319 | 10.276.638 |
| **DK** | 319.479 | 1.597.393 | 3.194.787 | 6.389.573 |
| **DE** | 2.420.316 | 12.101.579 | 24.203.159 | 48.406.318 |
| **EE** | 74.747 | 373.735 | 747.470 | 1.494.939 |
| **IE** | 272.672 | 1.363.362 | 2.726.725 | 5.453.449 |
| **EL** | 57.132 | 285.660 | 571.320 | 1.142.641 |
| **ES** | 1.892.215 | 9.461.075 | 18.922.151 | 37.844.301 |
| **FR** | 3.991.931 | 19.959.655 | 39.919.311 | 79.838.621 |
| **IT** | 268.619 | 1.343.096 | 2.686.192 | 5.372.385 |
| **CY** | 4.071 | 20.354 | 40.708 | 81.416 |
| **LT** | 140.739 | 703.694 | 1.407.388 | 2.814.776 |
| **LU** | 9.645 | 48.225 | 96.450 | 192.900 |
| **HU** | 267.013 | 1.335.066 | 2.670.131 | 5.340.262 |
| **MT** | 13.089 | 65.443 | 130.887 | 261.774 |
| **NL** | 927.196 | 4.635.978 | 9.271.957 | 18.543.914 |
| **AT** | 168.790 | 843.950 | 1.687.900 | 3.375.800 |
| **PT** | 527.050 | 2.635.249 | 5.270.499 | 10.540.997 |
| **SI** | 180.901 | 904.504 | 1.809.007 | 3.618.014 |
| **SK** | 43.584 | 217.919 | 435.837 | 871.674 |
| **FI** | 520.033 | 2.600.165 | 5.200.331 | 10.400.662 |
| **SE** | 366.793 | 1.833.964 | 3.667.928 | 7.335.856 |
| **UK** | 5.410.916 | 27.054.582 | 54.109.164 | 108.218.327 |
| **RO** | 124.948 | 624.742 | 1.249.485 | 2.498.969 |
| **NO** | 452.065 | 2.260.323 | 4.520.646 | 9.041.292 |
| **EU** | **19.196.028** | **95.980.139** | **191.960.278** | **383.920.556** |

Source: Authors elaboration on Eurobarometer 2002, Eurostat households survey on Internet and Internet Banking usage. Figure shown in euros.

As for the variability in the range of benefits under different scenarios the same considerations done in the previous paragraphs apply here, with one addition on the need for more survey on Internet and PwD. It is time that new surveys at EU27 comparable level are conducted to quantify how many PwD use Internet and the other related possibilities (eCommerce, Internet Banking, and eGovernment). The limits of our projections are all in the lack of such data.

* + 1. eGovernment gains for PwD

In brief, the rationale for this item is that IWA enable PwD to take advantage of the convenience and time-saving (given a monetary value) offered by eGovernment services (see §7.1.5 and §5.3.5).

Following the procedure illustrated in §5.3.5 of Annex 5.1, we have projected that the monetary value of the potential value of the savings from using eGovernment for PwD as a result of IWA can range from €6.5 million to €129 million as illustrated in Table 16.

Table 16: Impact of IWA on eGovernment gains under different target reached

| **Country** | **Target 5%** | **Target 25%** | **Target 50%** | **Target 100%** |
| --- | --- | --- | --- | --- |
| **BE** | 132.682 | 663.411 | 1.326.823 | 2.653.646 |
| **CZ** | 61.462 | 307.312 | 614.623 | 1.229.247 |
| **DK** | 134.981 | 674.907 | 1.349.814 | 2.699.628 |
| **DE** | 1.250.640 | 6.253.200 | 12.506.401 | 25.012.801 |
| **EE** | 4.614 | 23.070 | 46.139 | 92.279 |
| **IE** | 40.229 | 201.144 | 402.287 | 804.575 |
| **EL** | 49.452 | 247.260 | 494.520 | 989.041 |
| **ES** | 283.885 | 1.419.427 | 2.838.854 | 5.677.708 |
| **FR** | 1.394.038 | 6.970.188 | 13.940.376 | 27.880.751 |
| **IT** | 393.654 | 1.968.271 | 3.936.542 | 7.873.083 |
| **CY** | 5.250 | 26.252 | 52.503 | 105.006 |
| **LT** | 6.615 | 33.073 | 66.146 | 132.292 |
| **LU** | 3.765 | 18.825 | 37.650 | 75.299 |
| **HU** | 42.721 | 213.606 | 427.212 | 854.423 |
| **MT** | 1.384 | 6.921 | 13.843 | 27.686 |
| **NL** | 315.848 | 1.579.238 | 3.158.476 | 6.316.952 |
| **AT** | 101.572 | 507.859 | 1.015.719 | 2.031.438 |
| **PT** | 106.838 | 534.192 | 1.068.384 | 2.136.769 |
| **SI** | 23.489 | 117.443 | 234.885 | 469.770 |
| **SK** | 13.339 | 66.695 | 133.390 | 266.780 |
| **FI** | 177.993 | 889.965 | 1.779.930 | 3.559.860 |
| **SE** | 151.408 | 757.042 | 1.514.083 | 3.028.166 |
| **UK** | 1.599.273 | 7.996.366 | 15.992.731 | 31.985.463 |
| **RO** | 17.024 | 85.118 | 170.235 | 340.471 |
| **NO** | 154.107 | 770.535 | 1.541.071 | 3.082.142 |
| **EU** | **6.466.264** | **32.331.319** | **64.662.637** | **129.325.275** |

Source: Authors elaboration on Eurobarometer 2002, Eurostat households survey on Internet and eGovernment usage. Figure shown in euros.

As for the variability the same considerations done in the previous paragraphs apply here. We add also that these monetary measures are only a small proxy compared to the benefits of convenience (24 hours a day, 365 days a year without need of staying in line at public offices), but this cannot be quantified and monetised without large-scale surveys of citizens asking how much they value this convenience and their willingness to pay for more eGovernment services.

* + 1. Efficiency gains for public organisations

In brief, the rationale for this item is that, as IWA enables more PwD to use transactional eGovernment services, public administration gains in efficiency since the digital delivery of a service cost less than the face-to-face equivalent (see §4.2.1.2 and §5.4.2).

Following the procedure illustrated in §5.4.2 of Annex 5.1, we have projected that the monetary value of the potential increase in efficiency gains for public sector organisations resulting from increased usage of eGovernment by PwD as a result of IWA can range from a minimum of €14 million (reaching only 5% of the target) to a maximum of €295 million (reaching 100% of the target) as illustrated in Table 17.

Table 17: Impact of IWA on public sector efficiency gains under different target reached (Public sector yearly benefits)

| **Benefits** | **Target 5%** | **Target 25%** | **Target 50%** | **Target 100%** |
| --- | --- | --- | --- | --- |
| **TOTAL BENEFITS** | 14.793.007 | 73.965.037 | 147.930.075 | 295.860.150 |

Source: Authors elaboration on Eurobarometer 2002, Eurostat households survey on Internet and eGovernment usage. Figure shown in euros.

As for the variability the same considerations done in the previous paragraphs apply here. We could have more sizeable estimates if we could use more precise and granular data on the public service needs of PwD and if these needs were addressed by online public services. Yet, we do not have such empirical data on PwD and in general the most widespread online public services do not seem to cater widely for the specific needs of PwD.

* + 1. eCommerce gains for private companies

In brief, the rationale for this item is that, as IWA enables more PwD to effectively use the Internet, the pool of potential eCommerce consumers increases and so do the revenues for companies also considering that eShoppers tend to spend 20% more on any purchasing session than traditional shoppers (see §4.2.1.2 and §5.4.3).

Following the procedure illustrated in §5.4.3 of Annex 5.1, we have projected that the monetary value of the potential increase in revenues (resulting from increased usage of eCommerce by PwD as a result of IWA) can range from a minimum of €68 million (reaching only 5% of the target) to a maximum of €1.3 billion (reaching 100% of the target) illustrated in Table 18

Table 18: Impact of IWA on private sector eCommerce gains under different target reached

| **Benefits** | **Target 5%** | **Target 25%** | **Target 50%** | **Target 100%** |
| --- | --- | --- | --- | --- |
| **Total Benefits** | 68.500.880 | 342.504.402 | 685.008.804 | 1.370.017.608 |

Source: Authors elaboration on Eurobarometer 2002, Eurostat households survey on Internet and eCommerce usage, Eurostat 2009 Survey on enterprises and eCommerce. Figure shown in euros.

As for the variability the same considerations as in the previous paragraphs apply here. We could have more sizeable estimates if we had information on PwD who already use the Internet but cannot use eCommerce due to accessibility problems. Yet, survey at EU27 level providing such data do not exist.

* + 1. Organisational costs

Following the procedure illustrated in Annex 5.1, in order to estimate the aggregate set up and yearly extra-costs for organisations in EU27 solely attributable to the introduction of Web Accessibility we have considered an average of three exemplificative websites compliant with WCAG 2.0 AA level (one very simple, mostly informative, one average, mostly interactive, and one very complex, mostly transactional), combining insights from the questionnaire to web consultancies and the application of the Business Case Tool Macro (hereinafter referred to as BCT Macro) to case studies. We have disentangled the web accessibility specific costs from the costs common to the design of any website considering that the former concerns mostly the implementation of accessibility conformance only on some specific items (such as images, PDF documents, multimedia pieces, etc.). Such extra costs have been measured in terms of estimated number of workdays needed, to which we have applied country specific fees and cost of labour. For the public sector we reconstructed the total number of existing websites starting from the NUTS nomenclature and then we applied the MeAC2 (2011) score to quantify the number of public websites still in need of being made accessible. For the private sectors we took the total number of financial and non-financial enterprises from Eurostat, assumed all had a website, and then we applied the MeAC2 2011 score to quantify the number of private sector websites still in need of being made accessible.

As we explained earlier (§4.2.1.3), we found practically no scientifically and empirically robust treatment and calculation of the costs of introducing web accessibility. The debate is ridden with opposite views produced by practitioners defending opposite interests: some argue that the costs are negligible; while others claim that they are considerable. Our study is one of a kind in producing an estimate of costs based on substantial field work triangulated with statistics and based on assumptions validated through interviews with web accessibility experts. It is worth pointing out some limitations due to the need to calculate costs at EU27 aggregate level and the related lack of data. Firstly, the cost calculations above are based on a scenario where all web accessibility work is outsourced by the web owner organisations. We could project at EU27 the quantitative monetised information obtained by web consultancy and integrate them with available statistics on labour costs. On the other hand, it was not possible to understand in a coherent way which typology of organisation (by size and sector) and in which countries internal skills to implement web accessibility without outsourcing the work was established. Secondly, as it was not possible to produce aggregate calculations distinguishing the costs of building an accessible website from scratch from those of retrofitting an already existing website[[48]](#footnote-48). This forced us to make a few assumptions (see Chapter 7.2) and prevented us from taking into consideration some distinctions and nuances related to the peculiarities of the hundreds of thousands different organisations potentially affected, or to calculate different costs depending on the different lifecycles of websites.

With these limitations, we have projected the aggregate extra-cost attributable solely to introducing web accessibility. For the private sector the aggregate cost of yearly maintenance is close to €35 billion and the one-off set-up cost is about €201 billion. For the public sector the aggregate cost of yearly maintenance is about €350 million and the one-off set-up cost is approximately €2 billion.

* 1. Aggregate comparison of costs and benefits
     1. Method

The evidence previously presented separately (in Sections 5, and 6 is put together in this chapter, giving numbers concerning the overall net benefit arising from improved web accessibility, and in the end aggregate net cost/benefit results. To calculate these we sum up both the benefits for users and the benefits for organisations and weight them against the costs to organisations to make their websites accessible. At this stage it is worthwhile remembering that, while for costs we have relied on a unique value (the estimated accessibility cost for an average accessible website), for benefits we have made different assumptions about the potential impact of the policy, for both users and organisations.

* Users: when estimating the potential gains in employment, wages and quality of life we have been considering three different scenarios concerning the impact of the policy on the relevant variable (low, medium, high scenario, for more information see Annex 2.4) and then we have considered four different hypotheses regarding the share of the potential target population (i.e. the number of individuals restricted by a LSHPD) that is affected by the policy (5%, 25%, 50%, and 100%). For benefits arising from eCommerce, Internet Banking and eGovernment we have considered only the four hypotheses on the share of the target population affected by the policy.
* Organisations: when computing benefits from eCommerce and eGovernment we have considered only the four hypotheses concerning the share of the target population affected by the policy (5%, 25%, 50%, and 100%).
* It is important to consider different values for the share of the target population affected by the policy. We are, in fact, thinking of a situation in which costs have to be incurred by all relevant players (i.e. private and public organisations are forced to implement accessible websites), but potential beneficiaries cannot be forced to use Internet and reap the gains that web accessibility might generate for them. In other words, there is an inherent asymmetry between the treatment of costs and benefits, since the former are paid in full by all relevant organisations, while for benefits we make different hypotheses about the size of the population that would take advantage of them.
  + 1. Results

When looking at aggregate user benefits, we can see from Table 19 the different components and the overall values, considering the low-medium-high scenarios[[49]](#footnote-49) for the impact of the policy (referred to employment, wages and QALY only) and the four different assumptions about the share of the target population affected by improved web accessibility (for all the variables). We can see that the combination of all these factors generates results with a large range. We go from €4,579,238,611 in the case of scenario 1 (the “low” one for all the relevant variables and only 5% of the target population reached), to €59,403,389,509 in the case of scenario 2 (the “medium” one, and 25% of the target reached by the policy), to €205,754,214,350 when we look at scenario 3 (the “high” one and 50% of the target actually benefits from improved web accessibility), to the highest value of €411,508,428,700 obtained under scenario 3 and a 100% target reached.

We have estimated that for the private sector the aggregate cost of yearly maintenance is close to €35 billion and the one-off set-up cost are about €201 billion. For the public sector the aggregate cost of yearly maintenance are about €350 million and the one-off set-up cost are approximately €2 billion. When combining the costs with the organisational benefits, limited to increased sales in eCommerce and eBanking and to transaction costs savings for the public sector, we see that yearly net benefits remain always negative from the strict perspective of organisations (see Table 14 and Table 15 )

Yet, the picture changes when we look dynamically at the net present value (discounted over a 30-year period with a discount rate of 2.5%) of all benefits (user plus organisational benefits) against the costs (see Table 22).

The first thing we notice is that, when only **5% of the population is reached**, under no scenario about the policy impact we get positive net benefits. When we move to the case in which **25% of the population is reached**, we can see that in scenario 1 net benefits are negative for the whole period, because the set up cost and the yearly costs are very high relative to yearly benefits. However, in scenarios 2 and 3, in which benefits are higher, a positive net value is obtained after some years. In particular, under scenario 2 net benefits are positive after **ten** years from the introduction of the policy change, while they are positive after **four** years in the case of scenario 3 (the one where the user benefits are highest). Moving now to the case of **50% of the target population reached** by improved accessibility, we notice that, again, under scenario 1 we have a negative value for aggregate net benefits for most years (the value becomes positive after **twenty-three** years). However, net benefits are positive after **three** years under scenario 2 and after only **one** year under scenario 3. Finally, when the **full relevant population** is reached, under the less favourable scenario we have a positive net value after **four** years, while in the case of scenario 2 they are positive after only **one** year and from the start in case of scenario 3.

These results confirm the relevance of the hypothesis concerning the percentage of the overall target population that is affected by the policy change. For values above 25%, we can see that in the “medium” and “high” scenarios concerning the policy change, the net present value is positive after a reasonably short number of years (no more than ten), while it is never positive for the 5% case.

Table 19: Aggregate user benefits for 2011[[50]](#footnote-50)

| **Type** | **Scenario** | **Target 5%** | **Target 25%** | **Target 50%** | **Target 100%** |
| --- | --- | --- | --- | --- | --- |
| **Employment** (§7.1.1) | Scenario 1 | 142.631.466 | 713.157.331 | 1.426.314.661 | 2.852.629.322 |
| **Employment** (§7.1.1) | Scenario 2 | 2.800.931.283 | 14.004.656.417 | 28.009.312.835 | 56.018.625.669 |
| **Employment** (§7.1.1) | Scenario 3 | 5.601.862.567 | 28.009.312.835 | 56.018.625.669 | 112.037.251.338 |
| **Wages** (§7.1.2) | Scenario 1 | 3.593.295.871 | 18.355.815.394 | 36.711.630.788 | 73.423.261.577 |
| **Wages** (§7.1.2) | Scenario 2 | 5.219.581.373 | 26.097.906.865 | 52.195.813.730 | 104.391.627.460 |
| **Wages** (§7.1.2) | Scenario 3 | 7.342.326.158 | 36.711.630.788 | 73.423.261.577 | 146.846.523.154 |
| **QALY**  (§7.1.3) | Scenario 1 | 754.213.493 | 3.771.067.465 | 7.542.134.930 | 15.084.269.860 |
| **QALY**  (§7.1.3) | Scenario 2 | 3.771.067.465 | 18.855.337.325 | 37.710.674.651 | 75.421.349.301 |
| **QALY**  (§7.1.3) | Scenario 3 | 7.542.134.930 | 37.710.674.651 | 75.421.349.301 | 150.842.698.603 |
| **eCommerce** (§7.1.4) | All Scenarios | 63.435.489 | 317.177.444 | 634.354.887 | 1.268.709.774 |
| **eBanking** (§8.1.4) | All Scenarios | 19.196.028 | 95.980.139 | 191.960.278 | 383.920.556 |
| **eGovernment** (§7.1.5) | All Scenarios | 6.466.264 | 32.331.319 | 64.662.637 | 129.325.275 |
| **Total Benefits** | **Scenario 1** | **4.579.238.611** | **23.285.529.091** | **46.571.058.182** | **93.142.116.364** |
| **Total Benefits** | **Scenario 2** | **11.880.677.902** | **59.403.389.509** | **118.806.779.017** | **237.613.558.035** |
| **Total Benefits** | **Scenario 3** | **20.575.421.435** | **102.877.107.175** | **205.754.214.350** | **411.508.428.700** |

Source: Table, Table 10, Table 12, Table 14, Table 15, Table 16 . Figure shown in euros.

Table 20: Initial investment (year 0) net benefits for public sector (Public sector yearly net benefits)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Benefits** | **Target 5%** | **Target 25%** | **Target 50%** | **Target 100%** |
| **Total benefits** | 14.793.007 | 73.965.037 | 147.930.075 | 295.860.150 |
| **Total costs** | 358.368.500 | 358.368.500 | 358.368.500 | 358.368.500 |
| **Total net Benefits** | **-343.575.492** | **-284.403.463** | **-210.438.425** | **-62.508.350** |

Source: Table 16 and Table 64. Figure shown in euros.

Table 21: Initial investment (year 0) net benefits for private sector (Private sector yearly net benefits)

| **Benefits** | **Target 5%** | **Target 25%** | **Target 50%** | **Target 100%** |
| --- | --- | --- | --- | --- |
| **Total benefits** | 68.500.880 | 342.504.402 | 685.008.804 | 1.370.017.608 |
| **Total costs** | 35.540.829.076 | 35.540.829.076 | 35.540.829.076 | 35.540.829.076 |
| **Total net benefits** | **-35.472.328.196** | **-35.198.324.674** | **-34.855.820.272** | **-34.170.811.467** |

Source: Table 17 and Table 18. Figure shown in euros.

In order to calculate the aggregate net benefits of users and organisations illuminating the total net benefits, partners had to add the user’s yearly gains, the public and private sectors’ yearly net benefits, and then subtract the public and private sector set up costs.

The table below provides a summary of the derivations of the calculations.

Table 22: Aggregate EU net benefits of users and organisations summary, per target and scenario over 30 year horizon

| **Type** | **Scenario** | **Target 5%** | **Target 25%** | **Target 50%** | **Target 100%** |
| --- | --- | --- | --- | --- | --- |
| **User's yearly gains** | Scenario 1 | 100.424.042.585 | 510.658.466.144 | 1.021.316.932.287 | 2.042.633.864.574 |
| **User's yearly gains** | Scenario 2 | 260.546.742.586 | 1.302.733.712.928 | 2.605.467.425.855 | 5.210.934.851.710 |
| **User's yearly gains** | Scenario 3 | 451.225.012.288 | 2.256.125.061.442 | 4.512.250.122.884 | 9.024.500.245.768 |
| **Public sector yearly net benefits** | Scenario 1 | -777.918.536.274 | -771.909.558.872 | -764.398.337.119 | -749.375.893.613 |
| **Public sector yearly net benefits** | Scenario 2 | -777.918.536.274 | -771.909.558.872 | -764.398.337.119 | -749.375.893.613 |
| **Public sector yearly net benefits** | Scenario 3 | -777.918.536.274 | -771.909.558.872 | -764.398.337.119 | -749.375.893.613 |
| **Private sector yearly net benefits** | Scenario 1 | -7.534.711.078 | -6.237.051.148 | -4.614.976.236 | -1.370.826.412 |
| **Private sector yearly net benefits** | Scenario 2 | -7.534.711.078 | -6.237.051.148 | -4.614.976.236 | -1.370.826.412 |
| **Private sector yearly net benefits** | Scenario 3 | -7.534.711.078 | -6.237.051.148 | -4.614.976.236 | -1.370.826.412 |
| **Public sector set up costs** | Scenario 1 | 2.030.754.833 | 2.030.754.833 | 2.030.754.833 | 2.030.754.833 |
| **Public sector set up costs** | Scenario 2 | 2.030.754.833 | 2.030.754.833 | 2.030.754.833 | 2.030.754.833 |
| **Public sector set up costs** | Scenario 3 | 2.030.754.833 | 2.030.754.833 | 2.030.754.833 | 2.030.754.833 |
| **Private sector set up costs** | Scenario 1 | 201.398.031.430 | 201.398.031.430 | 201.398.031.430 | 201.398.031.430 |
| **Private sector set up costs** | Scenario 2 | 201.398.031.430 | 201.398.031.430 | 201.398.031.430 | 201.398.031.430 |
| **Private sector set up costs** | Scenario 3 | 201.398.031.430 | 201.398.031.430 | 201.398.031.430 | 201.398.031.430 |
| **Grand Total** | **Scenario 1** | -888.457.991.030 | -470.916.930.140 | 48.874.832.668 | 1.088.458.358.285 |
| **Grand Total** | **Scenario 2** | -728.335.291.030 | 321.158.316.644 | 1.633.025.326.236 | 4.256.759.345.422 |
| **Grand Total** | **Scenario 3** | -537.657.021.327 | 1.274.549.665.158 | 3.539.808.023.265 | 8.070.324.739.479 |

Source: Table 21, Table 64, Table 65. Figures shown in euros.

The subsequent tables show the full analysis of aggregate net benefits of users and organisations..

Table 23: Aggregate net benefits of users and organisations (Present value, Target 5%)

| **Years** | **scenario 1** | **scenario 2** | **scenario 3** |
| --- | --- | --- | --- |
| **0** | -234.665.451.341 | -227.364.012.050 | -218.669.268.517 |
| **1** | -30.474.795.197 | -23.351.439.791 | -14.868.763.174 |
| **2** | -29.731.507.510 | -22.781.892.479 | -14.506.110.413 |
| **3** | -29.006.348.790 | -22.226.236.565 | -14.152.302.842 |
| **4** | -28.298.876.868 | -21.684.133.234 | -13.807.124.724 |
| **5** | -27.608.660.359 | -21.155.251.936 | -13.470.365.585 |
| **6** | -26.935.278.399 | -20.639.270.182 | -13.141.820.083 |
| **7** | -26.278.320.389 | -20.135.873.348 | -12.821.287.885 |
| **8** | -25.637.385.746 | -19.644.754.486 | -12.508.573.547 |
| **9** | -25.012.083.654 | -19.165.614.132 | -12.203.486.387 |
| **10** | -24.402.032.834 | -18.698.160.129 | -11.905.840.378 |
| **11** | -23.806.861.301 | -18.242.107.443 | -11.615.454.027 |
| **12** | -23.226.206.147 | -17.797.177.993 | -11.332.150.270 |
| **13** | -22.659.713.315 | -17.363.100.481 | -11.055.756.361 |
| **14** | -22.107.037.380 | -16.939.610.226 | -10.786.103.767 |
| **15** | -21.567.841.346 | -16.526.449.001 | -10.523.028.065 |
| **16** | -21.041.796.435 | -16.123.364.879 | -10.266.368.844 |
| **17** | -20.528.581.888 | -15.730.112.077 | -10.015.969.604 |
| **18** | -20.027.884.769 | -15.346.450.807 | -9.771.677.663 |
| **19** | -19.539.399.775 | -14.972.147.128 | -9.533.344.061 |
| **20** | -19.062.829.048 | -14.606.972.808 | -9.300.823.474 |
| **21** | -18.597.881.999 | -14.250.705.179 | -9.073.974.121 |
| **22** | -18.144.275.120 | -13.903.127.004 | -8.852.657.679 |
| **23** | -17.701.731.825 | -13.564.026.345 | -8.636.739.199 |
| **24** | -17.269.982.268 | -13.233.196.434 | -8.426.087.024 |
| **25** | -16.848.763.188 | -12.910.435.545 | -8.220.572.706 |
| **26** | -16.437.817.745 | -12.595.546.874 | -8.020.070.933 |
| **27** | -16.036.895.361 | -12.288.338.413 | -7.824.459.446 |
| **28** | -15.645.751.572 | -11.988.622.842 | -7.633.618.972 |
| **29** | -15.264.147.875 | -11.696.217.407 | -7.447.433.144 |
| **30** | -14.891.851.585 | -11.410.943.812 | -7.265.788.433 |
| **Total net benefits over a 30 year horizon** | **-888.457.991.030** | **-728.335.291.030** | **-537.657.021.327** |

Source: Table 21, Table 64, Table 65. Figures shown in euros.

Table 24: Aggregate net benefits of users and organisations (Present value, Target 25%)

| **Years** | **scenario 1** | **scenario 2** | **scenario 3** |
| --- | --- | --- | --- |
| **0** | -215.625.985.309 | -179.508.124.891 | -136.034.407.225 |
| **1** | -11.899.706.386 | 23.337.230.607 | 65.750.613.696 |
| **2** | -11.609.469.645 | 22.768.029.861 | 64.146.940.191 |
| **3** | -11.326.311.848 | 22.212.712.059 | 62.582.380.674 |
| **4** | -11.050.060.340 | 21.670.938.594 | 61.055.981.146 |
| **5** | -10.780.546.673 | 21.142.379.116 | 59.566.810.874 |
| **6** | -10.517.606.510 | 20.626.711.333 | 58.113.961.828 |
| **7** | -10.261.079.522 | 20.123.620.813 | 56.696.548.125 |
| **8** | -10.010.809.290 | 19.632.800.793 | 55.313.705.488 |
| **9** | -9.766.643.210 | 19.153.951.993 | 53.964.590.720 |
| **10** | -9.528.432.400 | 18.686.782.432 | 52.648.381.190 |
| **11** | -9.296.031.610 | 18.231.007.251 | 51.364.274.332 |
| **12** | -9.069.299.131 | 17.786.348.538 | 50.111.487.153 |
| **13** | -8.848.096.713 | 17.352.535.159 | 48.889.255.759 |
| **14** | -8.632.289.476 | 16.929.302.594 | 47.696.834.887 |
| **15** | -8.421.745.831 | 16.516.392.774 | 46.533.497.451 |
| **16** | -8.216.337.396 | 16.113.553.926 | 45.398.534.098 |
| **17** | -8.015.938.923 | 15.720.540.416 | 44.291.252.779 |
| **18** | -7.820.428.217 | 15.337.112.601 | 43.210.978.321 |
| **19** | -7.629.686.066 | 14.963.036.684 | 42.157.052.020 |
| **20** | -7.443.596.162 | 14.598.084.569 | 41.128.831.239 |
| **21** | -7.262.045.036 | 14.242.033.726 | 40.125.689.014 |
| **22** | -7.084.921.986 | 13.894.667.050 | 39.147.013.672 |
| **23** | -6.912.119.011 | 13.555.772.732 | 38.192.208.461 |
| **24** | -6.743.530.742 | 13.225.144.129 | 37.260.691.181 |
| **25** | -6.579.054.383 | 12.902.579.638 | 36.351.893.835 |
| **26** | -6.418.589.642 | 12.587.882.573 | 35.465.262.278 |
| **27** | -6.262.038.675 | 12.280.861.047 | 34.600.255.881 |
| **28** | -6.109.306.024 | 11.981.327.851 | 33.756.347.201 |
| **29** | -5.960.298.560 | 11.689.100.342 | 32.933.021.660 |
| **30** | -5.814.925.425 | 11.404.000.334 | 32.129.777.229 |
| **Total net benefits over a 30 year horizon** | **-470.916.930.140** | **321.158.316.644** | **1.274.549.665.158** |

Source: Table 21, Table 64, Table 65. Figures shown in euros.

Table 25: Aggregate net benefits of users and organisations (Present value, Target 50%)

| **Years** | **scenario 1** | **scenario 2** | **scenario 3** |
| --- | --- | --- | --- |
| **0** | -191.923.986.778 | -119.688.265.943 | -32.740.830.611 |
| **1** | 11.224.194.620 | 81.698.068.605 | 166.524.834.783 |
| **2** | 10.950.433.775 | 79.705.432.786 | 162.463.253.447 |
| **3** | 10.683.350.025 | 77.761.397.840 | 158.500.735.070 |
| **4** | 10.422.780.512 | 75.864.778.380 | 154.634.863.483 |
| **5** | 10.168.566.353 | 74.014.417.932 | 150.863.281.447 |
| **6** | 9.920.552.540 | 72.209.188.226 | 147.183.689.217 |
| **7** | 9.678.587.844 | 70.447.988.513 | 143.593.843.138 |
| **8** | 9.442.524.725 | 68.729.744.891 | 140.091.554.281 |
| **9** | 9.212.219.244 | 67.053.409.650 | 136.674.687.104 |
| **10** | 8.987.530.970 | 65.417.960.634 | 133.341.158.150 |
| **11** | 8.768.322.898 | 63.822.400.619 | 130.088.934.780 |
| **12** | 8.554.461.364 | 62.265.756.701 | 126.916.033.932 |
| **13** | 8.345.815.964 | 60.747.079.708 | 123.820.520.909 |
| **14** | 8.142.259.477 | 59.265.443.618 | 120.800.508.204 |
| **15** | 7.943.667.783 | 57.819.944.993 | 117.854.154.346 |
| **16** | 7.749.919.788 | 56.409.702.432 | 114.979.662.776 |
| **17** | 7.560.897.354 | 55.033.856.032 | 112.175.280.757 |
| **18** | 7.376.485.224 | 53.691.566.860 | 109.439.298.300 |
| **19** | 7.196.570.950 | 52.382.016.449 | 106.770.047.122 |
| **20** | 7.021.044.829 | 51.104.406.292 | 104.165.899.631 |
| **21** | 6.849.799.833 | 49.857.957.358 | 101.625.267.933 |
| **22** | 6.682.731.545 | 48.641.909.617 | 99.146.602.861 |
| **23** | 6.519.738.092 | 47.455.521.578 | 96.728.393.035 |
| **24** | 6.360.720.090 | 46.298.069.832 | 94.369.163.937 |
| **25** | 6.205.580.576 | 45.168.848.616 | 92.067.477.012 |
| **26** | 6.054.224.952 | 44.067.169.382 | 89.821.928.792 |
| **27** | 5.906.560.929 | 42.992.360.373 | 87.631.150.041 |
| **28** | 5.762.498.467 | 41.943.766.217 | 85.493.804.918 |
| **29** | 5.621.949.724 | 40.920.747.529 | 83.408.590.164 |
| **30** | 5.484.828.999 | 39.922.680.516 | 81.374.234.306 |
| **Total net benefits over a 30 year horizon** | **48.874.832.668** | **1.633.025.326.236** | **3.539.808.023.265** |

Source: Table 21, Table 64, Table 65. Figures shown in euros.

Table 26: Aggregate net benefits of users and organisations (Present value, Target 100%)

| **Years** | **scenario 1** | **scenario 2** | **scenario 3** |
| --- | --- | --- | --- |
| **0** | -144.519.989.717 | -48.548.046 | 173.846.322.618 |
| **1** | 57.471.996.631 | 198.419.744.602 | 368.073.276.958 |
| **2** | 56.070.240.615 | 193.580.238.636 | 359.095.879.959 |
| **3** | 54.702.673.771 | 188.858.769.401 | 350.337.443.862 |
| **4** | 53.368.462.216 | 184.252.457.952 | 341.792.628.158 |
| **5** | 52.066.792.405 | 179.758.495.563 | 333.456.222.593 |
| **6** | 50.796.870.639 | 175.374.142.013 | 325.323.143.994 |
| **7** | 49.557.922.575 | 171.096.723.915 | 317.388.433.165 |
| **8** | 48.349.192.756 | 166.923.633.088 | 309.647.251.868 |
| **9** | 47.169.944.152 | 162.852.324.964 | 302.094.879.871 |
| **10** | 46.019.457.710 | 158.880.317.038 | 294.726.712.069 |
| **11** | 44.897.031.912 | 155.005.187.354 | 287.538.255.677 |
| **12** | 43.801.982.353 | 151.224.573.028 | 280.525.127.490 |
| **13** | 42.733.641.320 | 147.536.168.808 | 273.683.051.210 |
| **14** | 41.691.357.385 | 143.937.725.666 | 267.007.854.839 |
| **15** | 40.674.495.010 | 140.427.049.431 | 260.495.468.136 |
| **16** | 39.682.434.156 | 137.001.999.444 | 254.141.920.132 |
| **17** | 38.714.569.908 | 133.660.487.263 | 247.943.336.714 |
| **18** | 37.770.312.106 | 130.400.475.378 | 241.895.938.258 |
| **19** | 36.849.084.981 | 127.219.975.979 | 235.996.037.325 |
| **20** | 35.950.326.811 | 124.117.049.736 | 230.240.036.414 |
| **21** | 35.073.489.572 | 121.089.804.620 | 224.624.425.770 |
| **22** | 34.218.038.607 | 118.136.394.751 | 219.145.781.239 |
| **23** | 33.383.452.299 | 115.255.019.270 | 213.800.762.185 |
| **24** | 32.569.221.755 | 112.443.921.239 | 208.586.109.448 |
| **25** | 31.774.850.493 | 109.701.386.574 | 203.498.643.364 |
| **26** | 30.999.854.139 | 107.025.742.999 | 198.535.261.819 |
| **27** | 30.243.760.136 | 104.415.359.024 | 193.692.938.360 |
| **28** | 29.506.107.450 | 101.868.642.950 | 188.968.720.351 |
| **29** | 28.786.446.292 | 99.384.041.902 | 184.359.727.172 |
| **30** | 28.084.337.846 | 96.960.040.880 | 179.863.148.460 |
| **Total net benefits over a 30 year horizon** | **1.088.458.358.285** | **4.256.759.345.422** | **8.070.324.739.479** |

Source: Table 64, Table 65. Figures shown in euros.

The tables above show the net present value of aggregate benefits (users’ benefits plus organisations’ net benefits), discounted over a 30-year period with a discount rate of 2.5%. With this table we have separately calculated “break-even” points under each section, in order to see when the net benefits turn to a positive value over time. This is attained through summing the year 0 value (set up cost) together with each passing consecutive year’s value.

The first thing we notice is that, when only **5% of the population is reached**, as showing in Figure 12 below, under no scenario about the policy impact we get positive net benefits (“break-even” point).

Figure 12: Net Benefits net present value evolution, Target 5%

Descripción: This is line chart that shows the net benefits net present value evolution, Target 5%. It shows that scenarios 1 to 3 do not break even over time.

Source: Table 23

When we move to the case in which **25% of the population is reached**, Figure 13 below we can see that in scenario 1 the net benefits are negative for the whole period, because the set up cost and the yearly costs are very high relative to yearly benefits. However, in scenarios 2 and 3, in which benefits are higher, a positive net value is obtained after some years. In particular, under scenario 2 net benefits break even after **ten** years from the introduction of the policy change, while they break even after **four[[51]](#footnote-51)** years in the case of scenario 3 (the one where the users’ benefits are highest).

Figure 13: Net Benefits net present value evolution, Target 25%

Descripción: This line chart shows the net benefits net present value evolution, Target 25%. Scenario 1 shows that the net benefits are negative for the whole period. Under scenario 2 net benefits break even after ten years, while they break even after four years in the case of scenario 3. 

Source: Table 24

Moving now to the case of **50% of the target population reached** by improved accessibility, from Figure 14 below we notice that, again, under scenario 1 we have a negative value for aggregate net benefits for most years (the value breaks even after **twenty-three** years). However, net benefits break even and become positive after **three** years under scenario 2 and after only **one** year under scenario 3.

Figure 14: Net Benefits net present value evolution, Target 50%

Descripción: This line chart shows the net benefits net present value evolution, Target 50%. Under scenario 1 the value breaks even after twenty-three years. Under scenario 2, the value breaks even after 3 years, and under scenario 3, it breaks even after 1 year. 

Source: Table 25

Finally, when the **full relevant population** is reached, as from Figure 15 we can see that under the less favourable scenario we have a break-even positive value point after **four** years, while in the case of scenario 2 they break even and become positive after only **one** year and from the start in case of scenario 3.

Figure 15: Net Benefits net present value evolution, Target 100%

Descripción: This line chart shows the net benefits net present value evolution, Target 100%. Scenario 1 breaks even at 4 years, scenario 2 after 1 year and scenario 3 since the beginning. 

Source: Table 26

These results confirm the relevance of the hypothesis concerning the percentage of the overall target population that is affected by the policy change: for values above 25%, we can see that in the “medium” and “high” scenarios concerning the policy change the net present value is positive after a reasonably short number of years (no more than ten), while it is never breaks even for the 5% case.

* + 1. Preliminary comments

A more in-depth reflection on the results of the aggregate extrapolations on cost and benefits is to be found in the next section. Below, we provide a few preliminary comments.

It is evident that, under our assumption and estimation procedures, costs of IWA for organisations are higher than the benefit accruing to them. It is interesting to notice that a previous EU funded study (Cullen et al 2008) recognised that the cost-benefit outcomes may be less positive or possibly even negative in certain circumstances (where wide reach is not a core element of the business logic and/or where substantial initial investments might be needed to retrofit existing sites). In view of these circumstances this study proposed a mechanism allowing some form of derogation (on a case-by-case basis) in the event of proven undue burden could be included to avoid imposition of any substantial negative cost-benefit scenarios. This proposal may well apply here and, under such scenario, aggregate costs may be lower or at least distributed more across time. At any rate, even maintaining our own conservative approach (costs estimated on the high side, and benefits linked to several possible scenarios) and assuming that organisations may not be convinced or aware about the benefits from increased web accessibility, from a policy perspective the case for pushing increased web accessibility remains strong

* Social returns are higher than organisational costs. Although at aggregate level projected organisational costs are higher than projected organisational benefits, they are fully offset when we bring into the picture potential benefits accruing to users, which represent the social return for economy and society as a whole.
* Costs for public sector not really a private cost. The costs to the public sector cannot be considered as a private cost and could be seen as part of the IWA policy. So, the real burden for introducing web accessibility is only that applying to the private sector. If we remove the public sector costs, then aggregate social net benefit are positive from the very start.

Finally, one must go beyond the strictly monetisable benefits and consider that organisations may be willing or convinced to consider also the importance of other less quantifiable and more qualitative benefits such as improved social image and compliance with legislation.

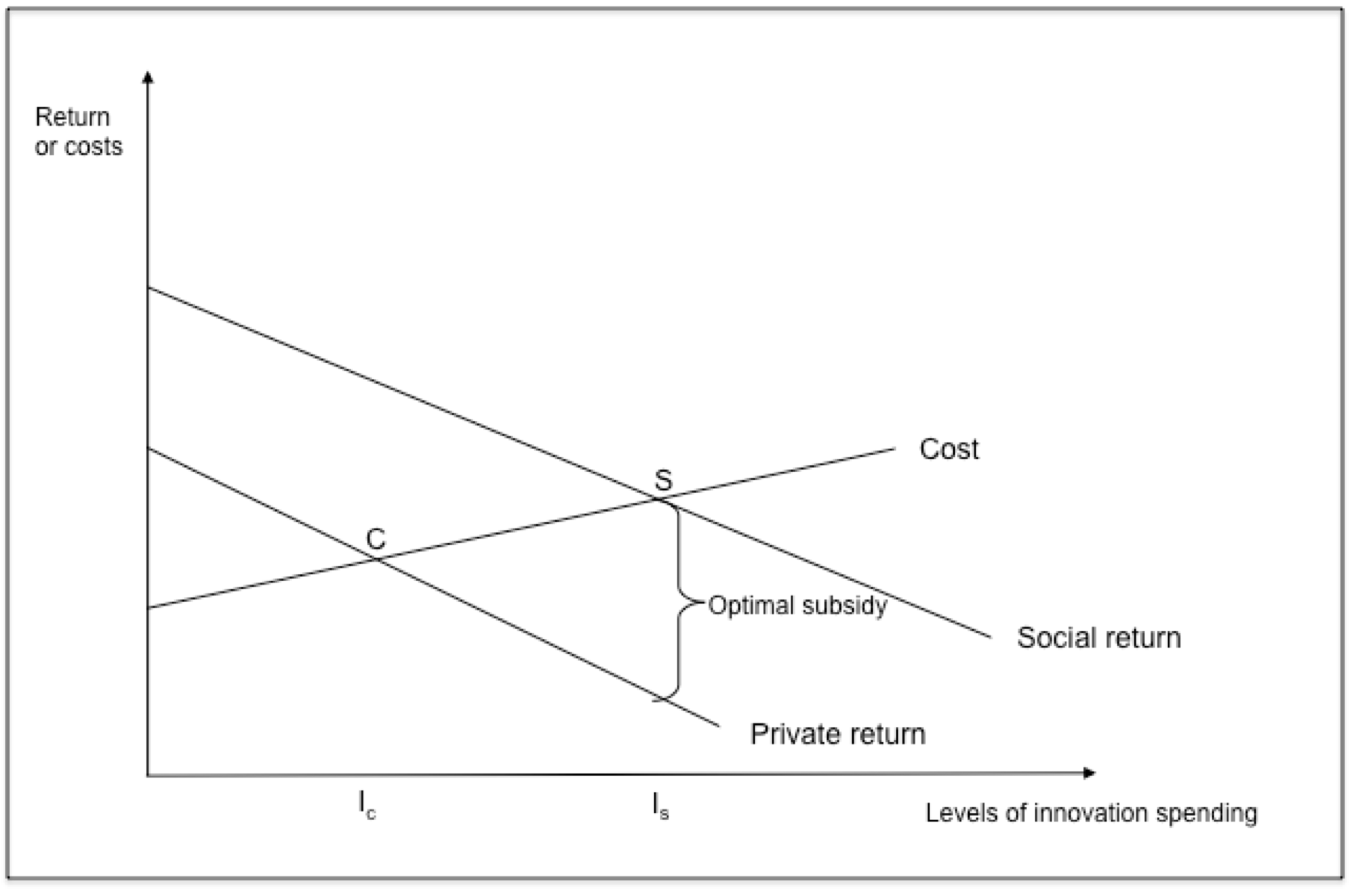
* 1. Interpreting the results: economics of innovation insights

The economics of innovation (see Hall and Rosenberg l 2011; Hall 2005) starts from a stylised conception of an organisation: a rationally oriented organisation always attempting to maximise profit. Naturally, private organisations maximise profits, whereas public ones should try to minimise costs to the budget and maximise quality-adjusted output (services that provide satisfaction to citizens). For the sake of simplification, we reason as if only private firms populate our universe of reference. The extension to public organisations is straightforward. The insights that can be drawn from classical economic reasoning are summarised as follows:

1. Innovation has costs that are generally considered capital costs to a large extent;
2. A profit maximising organisation will invest in innovation as long as there is evidence that innovation either increases revenues or reduces operating costs and so increases the firm profitability. Existing evidence (objective or subjectively perceived/ constructed) on the net benefits from innovation shapes such rational expectations in directions leading to invest in innovation or not to invest in it;
3. Investments in innovation are likely to generate profits/advantages if only a small number of competing organisations will adopt it and/or if the innovation generates large enough increases in demand in the market (if all organisations adopt the innovation and if the innovation does not generate new demand but simply a different way of meeting existing demand, the competitive mechanisms will soon bring the extra profits/advantages down to zero);
4. If many organisations are convinced about the relative advantage of the innovation and think they can capture a large enough fraction of the demand, then we could witness bandwagon effects and a widespread adoption of innovation (which eventually bring the extra profit/advantages down to zero when almost all firms have adopted an innovation and should prepare the grounds for the next innovation wave to take place);
5. There are, however, a number of factors that may stop bandwagon effects:
   * If in a given sector there is objectively a large first mover advantage (reaching efficient economy of scale quickly), or there is a subjective perception that a first mover advantage exists, other organisations cannot or will not copy the first mover (i.e., in our case if there is evidence or the perception that the first large financial institution introducing accessible Internet banking captures all or almost all of the extra online customers from the pool of PwD and elderly people, then other financial firms will have less economic incentives to invest into an accessible website for they see as unlikely the chances of increasing customer reach);
   * If there are perceived or objective high risk in adopting innovation (problems of observability, compatibility, complexity), large adoption will not occur;
   * If the cost of the capital investment is considered much higher than the returns from innovation, no bandwagon effects can be expected;
6. Even when innovation is adopted, this may happen with limited intensity, that is, only as long the marginal returns on investment offset the marginal costs of it;
7. On the other hand, there are several possible factors that may trigger bandwagon effects and offset the constraints under illustrated under points 5) and 6) above:
   * Strong new evidence on the relative advantage of the innovation (i.e., coming from studies on firms/organisations adopting it in another sector or country), possibly matched by more reassuring evidence on the other three Key Aspects (observability, compatibility, complexity) can convince firms to invest;
   * The above plus mimetic processes responding to the need of feeling in line with the peers may influence social “peer pressure” to follow the early innovators.” This means that if innovation is undertaken by organisations that are considered champions, very successful and legitimate in sector X, then all other organisations in that industry may want to copy the champions to feel legitimate and regardless of the previous rational oriented comparison between marginal costs and marginal returns. On the other hand, the same effect can be produced by peer pressure ‘naming and shaming’ monitoring exercises (benchmarking) or, in the opposite perspective, by widely publicised awards gratifying the adopters;
   * Policy interventions may: a) contribute to the conditions under 6a and 6b above (awareness and evidence on relative advantage and other characteristics, showcasing campaigns about champions); or more effectively, b) introduce measures that by lowering the costs also reduce the difference between private marginal costs and marginal return; c) introduce measures that open up / integrate markets and increase likelihood that innovation produce revenues; d) change the structure of incentives
   * Changes in the supply chain (among the firms that produce and supply some of the components needed to adopt an innovation) leading to more efficient production that lowers the costs of innovation (i.e., typically happening as a result of the above mentioned policy intervention: legislation creating larger and more standardised markets in terms of accessibility for companies producing ICT devices and contents result in economy of scale for the latter and lower costs for the ICT using organisations that decide to make their websites, DTV, or SST accessible).

Whereas, in general, economists tend to oppose policy measures that alter the physiological functioning of the market, in the case of innovation they favour subsidies, incentives, and any other form of interventions that support investments in innovation. This is so because economic theory holds that the social (for society as a whole) returns (social surplus) to innovation are higher than the private returns, as we explain with the support of Figure 16.)

Figure 16: Optimal value of subsidising innovation investments



Source: Hall (2005)

The downward slope of the two return curves in the figure reflects the traditional assumption of decreasing marginal returns, whereas in this example costs are assumed to rise with a flat slope. Profit maximising firms will stop at C and invest in innovation the amount IC that is exactly what they can fund with marginal returns from it. They invest until the marginal private returns from innovation are equal to its marginal costs.

The social return (social surplus) on innovation is higher and so it would be policy desirable that firms would keep investing at least up to the amount. Returns to society are higher because innovation always tends to bring a larger share of the returns to the consumers who get better products at lower prices (i.e., in the computer industry) and because innovation by a few can readily spill over to other firms and increase systemic productivity and economic growth. Yet, from the strict perspective of the maximising organisation, this means that it cannot capture and preserve all the returns from innovation and turn them into extra profits. This is a clear case of externality, whereby a large share of the returns ends up benefitting the consumers and the economy and society as a whole. Yet, if firms do not invest or do not invest enough in the innovation, this social surplus will be produced only in limited fashion (up to Ic only).

In short, if the policy makers want organisations to do innovation as to maximise social surplus, they must in various forms subsidise the difference from C to S in terms of costs, or find other ways to push firms to move from C to S. Subsidies can include, to limit ourselves to the most common, the following:

* Lower corporation tax rate (conditional on investment in innovation), which reduces the cost of capital in two ways; it lowers the minimal marginal return required to be economically profitable and it reduces the value of amortisation that can be deducted;
* Increase tax credits as a percentage of the value of investments;
* Allow for accelerated or anticipated amortisation of investments in innovation;

Act directly on the financing mechanisms by providing funding for innovation investments.

Whether they are provided through changes in the taxation leverage or with direct funding, it is evident that subsidising innovation represents a cost for the public budget. Yet, it is a cost that can be justified by future higher taxation revenues (from generalised productivity growth of the economic system and from increased consumption as consumers spend more for a more convenient price-quality ratio), or simply by the political or ethical importance of the higher social surplus potentially produced by more innovation.

On the other hand, as it can be derived from the discussion under point 7 above, policy makers can also use other measures to push companies to invest more in innovation:

1. Help awareness about benefits disseminating strong new evidence on the relative advantage of the innovation
2. Build up peer pressure through benchmarking and conformance schemes;
3. Introduce measures that by lowering the costs also reduce the difference between private marginal costs and marginal return;
4. Introduce measures that open up / integrate markets and increase likelihood that innovation produce revenues;
5. Change the structure of incentives;
6. Support changes in the supply chain (among the firms that produce and supply some of the components needed to adopt an innovation) leading to more efficient production that lower the costs of innovation. (This could happen, for instance, if legislation creates larger and more standardised markets in terms of accessibility for companies producing ICT devices and contents. This in turn results in economy of scale for the latter and lower costs for the ICT using organisations that decide to make their websites, DTV, or SST accessible.

We move now to apply the above reasoning to the topic of our study and in particular to the findings of the quantitative projections. The findings of the FLEQ and of the case studies[[52]](#footnote-52) clearly show that there are problems of relative advantage and observability. Even among organisations that have introduced web accessibility, there is little awareness and, especially, little capacity or willingness to:

1. Accurately consider all possible costs and benefits;
2. Produce an ex ante business case about them; and subsequently,
3. Monitor and report the results.

Hence, there is still a need for awareness raising and capacity building in the field of eAccessibility costs and benefits measurement

The fact that all respondents to our questionnaire point out social image as the most important benefit shows that they consider web accessibility positively compatible with their context of reference. The emphasis placed on social image suggests there is a good ground to mainstream web accessibility within issues of Corporate Social Responsibility (CSR) for what concerns consumers rights and quality of services. In this respect, this means that web accessibility and more generally eAccessibility cut across the domains of DG Information Society, DG SANCO (consumer protection through CSR), and DG Enterprise (CSR in general and especially its spread among SME).

Hence, there is need to push conformance assessment/certification/labelling to reinforce peer pressure, also mainstreaming eAccessibility as part of CSR frameworks

Innovation spreads also as a result of social influence and social networks and influential and successful innovators (champions) play a role in this process of diffusion. Champions’ campaigns and exchange of good practices could be among such mechanisms. Yet, judging from the results of MeAC2 (2011), it does seem that such measures are not sufficiently widespread among EU countries.

Hence, there is need for accompanying measures such as champions’ campaigns

Let us now move to discuss the potential implications of the quantitative aggregate projections of costs and benefits. Regardless of the results of our extrapolation, what matters in absence of any other intervention is how organisations perceive the issue of web accessibility costs and benefits. This means that we could find ourselves for what concerns web accessibility exactly in a situation where the social surplus of the innovation (user level benefits) is greater than the returns accruing to organisations, if not objectively at least from their subjective perspective. Even if we consider only the retail sector, we cannot expect all managers of online businesses to believe that they will capture all the potential economic benefits from increased customer reach. It is also unlikely that managers of public website will think that all new online users will visit their website, reduce transaction costs and produce efficiency gains. Moreover, at any given point in time with a fixed level of economic growth, increased web accessibility ensures wider reach but does not necessarily create new purchasing power. So, private organisations discounting the behaviour of competitors will assume they will be able to get only a small part of the benefits from increased sales or reduced costs due to channel switch. No matter how large the pools of PwD and of the elderly with minor impairments are, they are fixed in the short to mid-term, and so is their purchasing power. It cannot be realistically expected that they will visit and buy from all possible newly accessible websites, plus what they buy online cannot also be bought offline. Given a fixed budget, using economics terminology consumption is ‘rival’, if one buys from website of organisation X and from website of organisation Y, chances are that one will be left with no money to buy from website of organisation Z. It is also likely that in the retail and financial sector some large first movers might capture most of the benefits. Whereas the benefits potentially accruing to users are large, those for organisations are smaller or simply subjectively perceived as small. In addition, for some small firms with little capacity to increase and serve a wider online customer base or for large organisations with huge websites to be retrofitted, the costs could actually be a main constraint.

Hence, since aggregate projections of costs and benefits per se cannot change the behaviour of organisations, a variety of policy measures are needed to increase Web Accessibility beyond the levels in 2010 and 2011 by MeAC2.

We move now to the results of the extrapolations in order to concretely consider what kind of measures may be needed to change the physiological economic behaviour of organisations in the right direction.

As shown in §7.2.2, yearly net benefits for organisations are negative under any scenario. On the other hand, the social surplus measured by user benefits ranges from €4,579,238,611 in the case of scenario 1 (the “low” one for all the relevant variables and only 5% of the target population reached) to the highest value of €411,508,428,700 obtained under scenario 3 and a 100% target reached, this is a sizeable sum worth almost 4% of EU27 GDP. When comparing costs (only for organisations) with aggregate benefits (for users and organisations) in a dynamic fashion (net present value at 30 years discounted at 2.5%) we see positive results as long as we move from the middle level scenario (50% of target) onward.

Now in order to understand what policy can do we must make a very simple reasoning, first at the organisational level, and then at aggregate level. At the organisational level the rational economic reasoning of the firms can be changed only if costs decrease, and/or revenue increase, and/or new incentives are introduced that change the cost/revenue ratios. At the aggregate level, in order to maximise aggregate benefits we need to achieve the most favourable scenarios. We used scenarios to define the expected variability in the outcomes of increased web accessibility along two dimensions:

1. intensity and pervasiveness of policy effort: extent to which policy change is actually implemented and with what level of cogency. This shapes the extent to which the policy reaches the target;
2. intervening variables: even the most intense policy effort at increasing Web Accessibility, may not produce effects if large part of PwD are not aware about benefits of using Internet, or do not have other important skills obtained from formal education.

Now let us look at each of these elements and how they could be impacted.

* Increasing benefits of web accessibility for organisations**.** Increasing the revenues or efficiency gains that can come from increased reach and usage is beyond any possible policy interventions and run counter the constraints of fixed purchasing power and rival consumption.

Hence, the size of benefits organisations may realise by making their website accessible depends on systemic factors that cannot be impacted by policy measures

* Direct financial incentives (conditional on investing in Web Accessibility). For instance lower tax rates, tax credits, accelerated amortisation and funding can alter the cost/return ratios for an organisation even if revenues are fixed.

Hence, direct financial incentives can help further deployment of Web Accessibility and, although they are outside of the EU remit, the Commission may discuss them with Member States.

* Procurement incentives. An alternative and more promising way of changing the structure of incentives, although limited to the public procurement process, is exemplified by a practiced adopted in the Spanish action plan for the Information Society “Plan Avanza”. Plan Avanza tender specifications state that part of 20% of total eligibility criteria would be given to those participants whose websites were accessible. This is an interesting way of creating an incentive that ties potential revenues to web accessibility.

Hence, non-legislative procurement practices could be mainstreamed at EU level in addition to the public procurement initiatives currently under way.

* Decreasing costs. The analysis of the answers provided by the organisations contacted as part of our case studies suggest that the lack of a common EU legislation on Web accessibility is a source of uncertainty and additional costs, and a significant barrier to the emergence of an inclusive, digital, single market. Indeed, by the end of 2010, legislative differences in Europe remained substantial. It seems that the lack of standards for Web Accessibility at the EU level constitutes a barrier for the internal market. Companies offering their products/services in other Member States (either B2A, B2B or B2C) may have to make their websites compliant with each national standard. In practice, regulations at the EU level in this field are usually based on the Web Content Accessibility Guidelines (WCAG), which reduces the complexity, but as a consequence, companies have to develop local sites pending from a main site. As it is difficult to find a Web Accessibility consultancy that knows how to apply all of the different regulations among EU members, clients tend to hire a local Web Accessibility consultancy per local website. In the same way, Web Accessibility consultancies tend to look for national projects in order to avoid learning and applying other countries´ standards. Consumers/users need to minimise any barriers of access to the internal market and to free movement that may be posed by lack of web accessibility. The current fragmentation of legislation in EU27 implies that producers and providers of web-related goods and services industries cannot reach scale by accessing and selling in all of the EU due to lack of streamlined accessibility, which in turns keeps cost higher than a fully competitive internal market would justify. The most important item that should be impacted, however, are the current costs of web accessibility, which to some extent are the results of barriers to the full functioning of the internal market for accessible ICT products and services.

Hence, a systematic EU intervention in coordination with Member States can eliminate market fragmentation and barriers, which would result in lower Web Accessibility costs.

* Finally, in order to maximise the effectiveness of policy and reach the most favourable scenarios for user level benefits, we concluded that ***policy efforts in the domain of eAccessibility should be joined up with efforts in other areas of social policy.***

1. Policy implications
   1. Approach to the policy analysis of the findings

The general goal of ensuring eAccessibility (i.e. that the products and services of the information society can be used by people with disabilities and by other groups that may face accessibility challenges, such as older people with functional limitations) has now come to have an important position in EU policy. It is a dedicated theme within Information Society policy and now also an important component of disability/equality policy, as well as being a specific theme within EU telecoms/electronic communications and audiovisual media (TV) policy and in the fields of public procurement and (digital) copyright.

The situation has now evolved to a stage where there is a momentum towards strengthening EU policies in the eAccessibility field in order to address the situation that has been documented in studies such as “Measuring progress of eAccessibility in Europe” (MeAC1)[[53]](#footnote-53) and the “Study on Monitoring eAccessibility” (MeAC2)[[54]](#footnote-54) and the 'WCAG 2.0'[[55]](#footnote-55) study showing a varying and generally slow pace of progress across the EU Member States. There is a political commitment towards rapid improvement of the web accessibility situation and focused consideration is now being given to the question of what form of EU policy action should be the next step. As articulated in the Commission's Roadmap[[56]](#footnote-56) ("Web accessibility Action Plan"), three main policy options are being considered:

* No change (proceed with status quo, continue current types of activity - political encouragement, benchmarking, support for standards...)
* Recommendation, with reference to standards and appropriate levels of conformance
* Legally binding measure (Directive)

The Roadmap recalls the Commission’s “firm commitment” on web accessibility contained in the Digital Agenda for Europe whereby the Commission will “based on a review of options, make proposals by 2011 that will secure public sector websites (and websites providing basic services to citizens) are fully accessible by 2015”. The UN Convention of the Rights of Persons with Disabilities was ratified by the EU in December 2010 which further emphasises the need for measurements to be implemented by the EU, its institutions and Member States.[[57]](#footnote-57)

The results of the current study and their implications need to be considered in light of this policy context. Some relevant aspects of the policy deliberations at present include:

* Whether or not binding EU web accessibility legislation is warranted.
* What should be the scope of such legislation, if opted for, in terms of the obligations to be placed on the relevant players; and what economic considerations need to be taken into account in relation to this?

Both the equality/anti-discrimination and internal market domains are relevant in this respect.

In addition, in the field of standards development, the on-going work of Phase 2 of Mandate 376 by the European Standardisation Organisations (ESOs) has an important relevance for any new policy measures to be taken in the field of web accessibility for two reasons. The first is that the European Standard, or EN, that will underpin the procurement toolkit will incorporate the Web Content Accessibility Guidelines 2.0 with the effect that it will be possible to reference these requirements within a regulation. Also these requirements will be harmonised with those being developed under the current Section 508 refresh in the United States. However the EN will not be published before September 2013.[[58]](#footnote-58) The implications for these developments within the standardisation field are discussed further in the section on internal market.

In the following sections the key results of the study are summarised and discussed in relation to the insights that they may provide for purposes of policy guidance. The discussion is elaborated in terms of the following themes:

* scale of the overall (aggregate) social and economic issues concerned
* distribution of costs and benefits across sectors / individual organisations
* centre-of-gravity: equality/antidiscrimination, internal market, or both
* any other relevant results (mainly from MeAC2 study).

This study and our findings should be expected to give important insight to any possible proposal of legislative or non-legislative interventions in the field of Web Accessibility. We did already extract some general considerations from a strictly economics perspective in §7.3. This section will look again at the same findings more from the perspective of policy analysis.

* 1. Scale of the aggregate socioeconomic issues concerned
     1. Aggregate user benefits

On the user benefits side the study has provided a deeper examination of some aspects of the potential contribution of web accessibility that already have been given some consideration in earlier analyses[[59]](#footnote-59),[[60]](#footnote-60) as well as adding some new measurement themes, for example quality adjusted life years (QALYs). Table 27 below summarises the results of the work according to the dimensions that were quantified (and monetised) in the analysis.

Table 27: Quantified user benefit for 2011

| **DIMENSION** | **Estimated Aggregate EU27 (Euro)**  **Lower bound** | **Estimated Aggregate EU27 (Euro)**  **Upper bound** |
| --- | --- | --- |
| Increased employment of people with disabilities (§7.1.1) | 142.6 million | 112 billion |
| Potential increases in wages for people with disabilities (§7.1.2) | 3.6 billion | 146.8 billion |
| Health utility benefits as measured by QALY (§7.1.3) | 754 million | 150.8 billion |
| Increased consumer welfare from access to eCommerce (§7.1.4) | 63.4 million | 1.3 billion |
| Increased consumer welfare from access to eBanking (§7.1.4) | 19.2 million | 383.9 million |
| Increased convenience and saving from access to eGovernment services (§7.1.5) | 6.5 million | 129.3 million |
| **Total benefits** | **4.6 billion** | **411.5 billion** |

Source: Study Consortium elaboration, see Annex 2.4

In addition, the models developed on the basis of literature review and the study’s own analysis identified a range of areas of benefit that are qualitative (thus, less suitable for quantification/monetisation) or could not be quantified at EU27 level but are nonetheless of fundamental value and importance, including:

* Reduced social costs
* Wider and better social relations and communications (including increase in access to chat, support groups etc. through Web 2.0)
* Increase in everyday autonomy
* Increase in self-esteem and self-determination
* Increase in access to leisure and culture
* Increase in political participation.

In particular, the quantitative/monetised results suggest that the scale of overall benefits for users may potentially be enormous. In total, when summing the areas of quantified benefit, on the aggregate across the EU27, the estimate for potential user benefits on these dimensions ranges from a lower bound of about €4.6 billion to a higher bound of more than €411 billion (the reasons for variability have already been explained both throughout §7.2.1, and §2.4 of Annex 2.1).

* + - 1. **Opportunity for substantial benefits supports the policy case**

From an EU policy perspective it would seem that the possibility to achieve benefits on this scale is certainly worth considering. All other things being equal (especially if there were to be a net cost-benefit equation when costs are also taken into account), the results would suggest that the consideration of strong measures in the web accessibility field at EU level would be warranted from the point of view of the scale of the user benefits that could potentially be achieved. The opportunity to achieve benefits of this scale for a currently disadvantaged social grouping would thus be a central motivation for strong policy measures. In addition, some of these user side benefits clearly also bring with them potentially direct and quantifiable benefits for public finances (for example, increased employment among people with disabilities reduces social protection costs, increased QUALY may reduce burden on public care services). In this respect it is worth recalling that we have clearly identified “reduced social costs” (that can be also seen as achieving public finances benefits) as one key impact of increased Web Accessibility and reported various examples of estimations for the US, Ontario, and UK (see § 4.2.1).

In addition, the more qualitative and un-quantified benefits listed are of course quite fundamental areas for full participation, engagement and fulfilment in society. They are also profoundly important for the overall value case for eAccessibility. Policies that can help promote these for groups that are currently disadvantaged aligned with enshrined EU values and competencies that occupy an equal place alongside those that relate to the more quantifiable, economic and potentially monetised dimensions. Although a clear and overall very substantial value case is indicated from these combined quantitative and qualitative results, these results must be used with care when it comes to decision-making about whether to introduce harder measures, such as Directives, into the EU *acquis*. Later sections will take this up in more detail, especially in the presentation and discussion of net benefits and the distribution of costs and benefits across different sectors and players.

* + - 1. **Down-stream benefits may be larger than the more immediate benefits**

One aspect that can briefly be flagged concerns the relative contribution of direct or immediate benefits (especially efficiencies/savings from interacting with public administration online instead of in more traditional ways or from online shopping/banking) and wider, more downstream benefits on the employment/wages and QALY dimensions. In the calculations prepared by this study, the aggregate level of the direct or immediate user efficiencies/savings is considerably smaller than those in the areas of employment/wages and QALY. This in itself is perhaps not especially surprising or problematic on the user benefits side but, as will be taken up later, the differentiation of benefits in terms of the degree of closeness of their link to direct usage of particular websites is quite important in the analysis of costs and benefits on the organisational side.

* + - 1. **Immediate benefit figures might be on the conservative side**

Specifically in relation to the sizing of user benefits in the three areas closest to the immediate business case for web owner organisations (increased convenience and saving from access to eGovernment services; increased consumer welfare from access to eCommerce; increased consumer welfare from access to eBanking), it can be noted that the estimates calculated in this study are perhaps especially conservative. Please note that case study benefits for users and for the organisations managing accessible websites are linked:

1. the more users access and use websites for eCommerce, eBanking and eGovernment and the more they save money and time;
2. yet, as they do so, companies and banks offering eCommerce and eBanking also increase their revenues, whereas usage of eGovernment produce efficiency gains for public administrations.

The base population included in the analysis is based on the estimated ‘disability gap’ in Internet usage (the difference in the percentage of people with disabilities who are internet users compared to the general population). In reality, of course, many people with disabilities who are in fact online (at least nominally in terms of having an internet connection and using the internet to the extent that the level of accessibility of websites of interest allows) can also be included in the group that stand to benefit from more accessibility of public administration, online shopping and online banking websites. Therefore, it could be considered that the lower bound figures presented for these dimensions may be very conservative and some may argue that figures towards the upper bound would be quite plausible. However, various reasons for applying a more conservative approach have been elaborated in Annex 5.1 (§5.3.4).

* + 1. Aggregate organisational benefits (web owners)

On the organisational benefits side the focus was on those dimensions that are closest to the business case for public administration or eCommerce websites. Table 28 below summarises the results of the work according to the dimensions that were quantified (and monetised) in the analysis, namely, public sector efficiency gains and private sector eCommerce gains.

Table 28: Quantified organisational benefits for 2011

| **Dimension** | **Estimated Aggregate EU27 (Euro)**  **Lower Bound** | **Estimated Aggregate EU27 (Euro)**  **Upper Bound** |
| --- | --- | --- |
| Public sector efficiency gains (§7.1.6) | 14.8 million | 295.9 million |
| Private sector eCommerce gains (§7.1.7) | 68.5 million | 1.4 billion |

Source: Study Consortium’s elaboration, see Annex 2.4

In addition, the models developed on the basis of literature review and the study’s own analysis identified a range of areas of benefit, some of which are quite tangible and which could in principle be quantified if suitable data were available. These include:

Tangible, not quantified

* cost reduction from technical improvements,
* larger audience/reach,
* better rank in search engines,
* increase in employees' productivity,
* more effective recruitment process,

Less tangible or qualitative,

* improved social responsibility and image,
* compliance with legislation.

These results provide some important evidence and insights for EU policy in the web accessibility field. According to these calculations, on the aggregate the potential quantified organisational benefits for the entire complement of public sector web-owners across the EU 27 range from a lower bound of €14.8 million to an upper bound of €295.9 million, and for private sector (eCommerce) web owners from a lower bound of €68.5 million to an upper bound of €1.4 billion.

As in the case of user benefits, the calculation was based on a 12% gap to be filled in, which is 12% of PwD would start to use eCommerce, eGovernment, and eBanking. So the lower bound estimate (based on 5% of this target group) is derived from an increased reach of just 0.6% of people with disabilities and the upper bound estimate (based on 100% of this target group) is derived from an increased reach of 12% of people with disabilities. If this were felt to be overly conservative, a calculation based on the full population of disabled people (not the 12% ‘gap’) would multiply the efficiency/eCommerce organisation benefits by a factor of more than eight. However, various reasons for applying a more conservative approach have been elaborated in Annex 5.1 (§5.3.4).

* + - 1. **The presentation of the benefits for web owners must be carefully constructed**

At this point, and given the apparently relatively modest efficiency/business gains that have been directly quantified in the calculations of the project, it is important to also give some consideration to the wider set of organisational benefits that have been identified in the project's work and listed above. As we showed in § 5.1 and § 5.2, although the wider literature reviewed has suggested a range of tangible and intangible benefits, organisations have so far taken actions to introduce web accessibility being mainly motivated by considerations linked to social responsibility/image and, where applicable, compliance with legislation/regulations rather than because of a more immediate and direct 'business case'. At the risk of over-simplification, it could be postulated that heightening awareness of the business case aspect and provision of tools to help organisations to more sharply address this could potentially have contrasting effects depending on the characteristics of the organisations:

* Larger organisations that have a potentially large possibility to expand customer reach and already spend considerable sum of money for ICT in general could be convinced to invest into Web Accessibility by a full business case calculation. The potential new tangible benefits would be sizeable, whereas the additional cost attributable only to Web Accessibility would represent a very marginal percentage of total ICT costs;
* A business case approach may instead discourage actions to implement web accessibility among some organisations (i.e. with a small audience and/or with limited ICT budget) that otherwise would have done so without worrying too much about a proven business case.

In particular, these types of consideration are important in relation to the Business Case Tool (BCT) that has been developed in the project and the role that it might play in the policy process. Issues around the BCT are taken up again later.

* + 1. Aggregate organisational level costs

For this aspect, we focused on costs to web-owner organisations attributable solely to the introduction of web accessibility. The key data underpinning the calculation of these costs comes from empirical work to estimate the typical effort (in person days) required to achieve and maintain accessibility in websites. The reader should be reminded of the limitations deriving from the need of calculating EU27 aggregate level costs (see §7.1.8).

Table 29: Aggregate organisational costs for 2011

| **Sector** | **Estimated Aggregate EU27 (Euro)**  **Initial** | **Estimated Aggregate EU27 (Euro)**  **On-going** |
| --- | --- | --- |
| Public administration (§7.1.8) | 2 billion | 358.3 million |
| Private sector (§7.1.8) | 201.3 billion | 35.5 billion |

Source: Study Consortium’s elaboration

On the face of these results, the costs of implementing web accessibility would appear to be fairly high (at least at aggregate level) both for the public sector and for the private sector.

* + - 1. **…But the aggregate and absolute figure needs interpretation…**

However, the aggregate costs would of course be distributed across the large numbers of individual entities (at national, regional and local levels) that comprise the overall public administration sector in the EU27 and similarly for the private sector. Smaller organisations with smaller websites will spend considerably less than larger ones with larger websites, and such costs will have to be weighed against ICT overall budget that will be of quite different orders of magnitude for small and large organisation. Indeed, looking at them in terms of the proportion of overall ICT spending that they represent can usefully situate these cost estimates.

We’ve taken the total expenditure on ICT at EU27 level for both the private and public sectors. Our calculations of web accessibility were then divided by the total ICT expenditure of the public and private sectors in order to calculate the proportion of the web accessibility costs over the total ICT expenditure. Additional calculations prepared by the study (based on The World Information Technology and Services Alliance ‘WITSA”[[61]](#footnote-61) data and this study’s estimations presented in D4 deliverable) suggest that for 2011:

* Public sector total (set up and on-going) web accessibility costs represent only 2.53% of total government expenditure in ICT,
* Private sector total (set up and on-going) web accessibility costs represent as much as 16.2% of total private sector expenditures in ICT,
* Total web accessibility costs for public sector only (estimated to be 2.389 million euro, as presented in D4 deliverable), means spending:
  + €53.10 per person with disability (45 million) or
  + €21.72 per person with disability and elderly person (110 million).

More generally these are aggregate costs and, on their own, do not really provide much insight for policy purposes.

* + - 1. **…And other costs scenarios could be considered…**

Additionally, it is possible to point to other ways of presenting results that might be helpful going forward. From an EU policy perspective this is not necessarily just an issue of ‘optics’ (i.e. how the case is presented) but could also have some concrete implications. As explained, for reasons of data availability and feasibility the cost calculations above are based on a scenario where all web accessibility work was outsourced by the web owner organisations. If some or all of this work was in fact done in-house (if appropriate skills were already available or could be acquired) then the costs would be expected to reduce substantially. For example, quick ‘back of the envelope’ calculations for the public administration sector suggest that the aggregate (actual) cost might reduce by one third or more if done entirely in-house. Apart from the impacts on aggregate costs, some other policy implications may arise from these considerations. For example, policy efforts to encourage up-skilling of web accessibility capabilities of in-house staff in public administration across the EU could conceivably be considered as part of a cost reducing measure to accompany any hard measures requiring web accessibility. On the other hand, of course, such considerations would need to be offset against possible policy objectives to stimulate European industry in the web accessibility consultancy field (whether as a specialist niche or as part of the mainstream web consultancy industry), for which the larger the market for outsourced web accessibility services, the better. Some further considerations in regard to this aspect are discussed in the later section on the internal market dimension. For now, the point can be made that the ways that public administration across Europe goes about implementing web accessibility is likely to have a significant bearing on costs for the sector as well as in the marketplace around provision of web accessibility services. For example, the cost associated with externally provided web accessibility services might vary considerably depending on whether the norm was to source from specialist web accessibility consultancies or to attempt to require this from the mainstream web consultancy industry with an expectation of little or no additional costs.

* + - 1. **…Including factoring-in web design/redesign lifecycle considerations**

Partly linked to the above is the issue of the possibilities that may exist for substantial cost containment (as well as additional efficiency gains) if accessibility were to be built into public sector organisations' web management processes more generally, in their policies and procedures in relation to web site construction and on-going content management and/or in their selection of web tools to underpin these. Here the issue concerns differentiation of costs for accessibility for 'new build' websites as opposed to 'retrofitting' accessibility to existing sites. Whereas aggregate EU27 calculation of costs broken down into these two categories (accessible website from scratch or existing website retrofitted) were not possible, this aspect is quite relevant for the EU policy process as one currently considered option suggests different implementation timeframes for web accessibility for public administration websites, for 'newly created' websites and 'already existing websites'. The principle underpinning this is probably clear (to ensure inclusion of accessibility at the early stage when it may be expected to be much less costly and also more effective, and to give more time for existing sites to achieve compliance). However, for the policy process there are complexities that need to be explored around the concepts of 'newly created' versus 'existing' as the more relevant issue in many cases may be around the redesign lifecycles for public administration websites. If this were so, then the challenge might be one of crafting a policy approach that ensures that accessibility is addressed as quickly as possible by all public administration sites whilst also dovetailing with the 'natural' web design/major re-design lifecycles that anyway occur in the real-world[[62]](#footnote-62). Our study has shown that, across a number of cost variables including training, web programming, assessing level of accessibility and certification, the overall effort, and therefore cost, to implement accessibility is the same where a website in ‘newly created’ and where accessibility is retrofitted onto an ‘existing’ website. However an important distinction between the two phases of ‘newly created’ and ‘existing’ websites is the potentially complex and therefore costly proposition of changing the underlying technology, such as the content management system (CMS), that is used to create and manage an existing and inaccessible website. Consultation with web accessibility consultancies showed that the potential costs of upgrading or changing entirely an inaccessible CMS could only be calculated on a purely case by case basis due to factors including the extent to which a particular CMS supports web accessibility and how it is deployed, configured, customised and used to suit a client’s needs. However the general evidence collated in the literature review as well as coming from the organisational surveys and case studies would suggest that the conventional wisdom that inclusion of accessibility at the design (or major redesign) stage of a website's lifecycle is likely to be substantially less costly than if having to implement accessibility in an existing site (at an in opportune stage of its design/re-design lifecycle). Nevertheless this is an aspect that warrants attention in the EU policy process. In any case, as mentioned above already, there is a need to further tease out the issues around 'newly created' and 'existing' websites.

Consideration might also be given to further investigation of the actual realities of the web site design/redesign lifecycle across the public administration sector in the Member States in order to get more solid data on the relative costs at different points. This, however, will have to be limited to well defined and self-contained case studies and cannot be expected to produce aggregate EU27 calculations. Another web design/redesign phase that warrants consideration is that of on-going publication of content to both new and existing websites. Content may be published in web format (HTML) through the CMS or, as is the case with many public sector websites examined in MeAC2, the content may also be published in other formats, the most popular being PDF. An important distinction here is that, unlike content in HTML, content in PDF is unlikely to be created by the CMS and only ‘placed’ onto the website through the CMS. The on-going creation and publication of content in accessible PDF and other formats is most likely to be a separate and distinct process that could be considered as one that is worthy of separate consideration within implementation timeframes of any policy intervention.[[63]](#footnote-63) This distinct web content creation and publication, or workflow, phase could be upgraded in the shorter term, as it is likely independent of the more substantive work of replacing/upgrading an entire CMS that could occur over a longer timeframe. In any case, as mentioned above already, there is a need to further explore the issues around 'newly created' and 'existing' websites with respect to implementation timeframes. Consideration might also be given to further investigation of the actual realities of the web site design/redesign lifecycle across the public administration sector in the Member States in order to get more solid data on the relative costs at different points.

* + - 1. **Are issues at this level of high or low policy relevance?**

Matters of costs may be of relatively low or high relevance for EU policy, depending on the perspective or approach taken. On the one hand, if the main approach is to be one of 'hands off' derogation to the Member States to deal with the web accessibility issue (albeit within the frame of common commitments underpinned by binding legislation) then these matters could be left to the Member States. On the other hand, if the scope of the approach at EU level was to include accompanying measures to support the Member States in operational ways, then further EU efforts might need to be considered, to be followed by incorporating mechanisms for raising awareness and developing capacity across the public administration sector in these aspects. Intertwined with this might also be some issues with an internal market dimension, as discussed above, that also link with the approach to be adopted in public procurement. In regard to the latter, the issues here are less concerned with the standards that might be employed for web accessibility procurement but more concerned with the appropriate positioning of public procurement in this field in terms of how it can influence the market for web accessibility services. Overall, however, these aspects are perhaps more important in relation to considerations about fairness of burden across organisations than in relation to overall aggregate costs (although aggregate cost calculations might reduce quite a bit if these types of lifecycle distinctions were factored in).

* + 1. Aggregate costs-benefits

Two main high-level results have been generated from the aggregate results:

* The aggregate yearly net benefits (the direct ‘business case’) for the EU public administration sector (taking its costs and its own efficiency gains in account) and for the private sector (taking its costs and its own eCommerce gains into account) are negative in both cases:
  + For the public sector, the yearly net excess of costs over benefits is estimated to be somewhere between €65.5 and 343.5 million.
  + For the private sector, the yearly net excess of costs over benefits is calculated as between €34.1 and 35.4 billion.
* However, the overall net benefits at societal level (when user benefits are also added) are positive under most scenarios that have been calculated, either immediately or over a reasonably short number of years.
  + - 1. **Strong overall value case for EU accessibility measures**

To begin with, the fact that the calculated overall aggregate net benefits at societal level (for the EU27 as a whole) are positive under most scenarios, either immediately or over a reasonably short number of years, provides important reassurance that strong efforts to increase levels of web accessibility across the EU would be expected to yield very positive benefits overall. Although the general value case for more web accessibility, in a qualitative sense, has been well accepted at this stage, our results suggest that this is underpinned by a strong quantitative (economic) case as well. This evidence, per se, would therefore be supportive for stronger EU level measures in this field. The logic being that the more web accessibility is achieved, and the more people across Europe that are reached by this, the more positive would be the overall level of benefits that are realised. These types of conclusion are in line with the results of other earlier studies, which did not extend to the type of detailed quantitative (economic) estimations that have been a core element of the current study[[64]](#footnote-64).

* + - 1. **But immediate and direct efficiency/ecommerce business case is less strong…**

Turning to the other main findings of the study, the policy implications of the negative aggregate net benefits (in terms of the quantified immediate business case for the entities that would have to implement web accessibility) both for the public administration web owner sector as a whole and for the private web owner sector as a whole also need to be considered. As regards the public administration sector, the aggregate results suggest that the efficiency business case for public administration organisations, on its own and without other incentives, would not encourage a concerted movement towards web accessibility in the sector. Also other studies have previously also suggested the possibility of negative aggregate business case outcomes for the public administration sector under some scenarios[[65]](#footnote-65). For now the main policy insight to be gained from our results is that the direct efficiency case for public administrations may not necessarily be very positive overall and in fact might be somewhat negative.

* + - 1. **…Although the net costs may be quite small in relative terms**

Having said this, however, it could be considered that neither the absolute (negative) amounts nor the relative (negative) amounts, when compared to overall public administration ICT spending, should in fact be seen as being especially high or as likely to present a major barrier to public sector implementation of something as manifestly valuable as web accessibility.

* + - 1. **Incentivisation of web owner sectors**

Nevertheless it could still be the case that the public administration sector itself might be reluctant to become sufficiently enthusiastic about web accessibility on its own initiative. In times of budgetary tightness, for example, there might be reluctance to bear the costs if the benefits are perceived as accruing more downstream and/or in other parts of the public sphere. Therefore, based on the economics of innovation perspective presented earlier (§ 7.3), the consideration of possible incentivisation or other forms of financial support for the public administration sector might possibly be warranted, such as centralized financing or cross-subsidy for web accessibility from other public budgets. In the context of the proposed approach of EU level legislation with substantial derogation of implementation scope and modalities to the Member States, these issues could be taken up in various ways. They could, for example, be addressed in a more awareness-raising manner, being tabled as matters for possible common consideration across the Member States or they could possibly be considered as warranting a more operationally effective EU level approach. For the latter approach, for example, one possibility would be clear earmarking and promotion of existing EU financing mechanisms that could be used for supporting initial web accessibility costs in the Member States, such as under the Structural Funds.

Turning to the private sector, the results suggest that the aggregate net benefits (based on costs and the direct eCommerce gains that might be achieved) for the sector as whole also be quite negative. This poses an issue for EU policy consideration as the achievement of the calculated wider and larger user/public value benefits would be dependent not just on accessibility of public websites but also on much wider diffusion of accessibility across the websites that people commonly use every day, as consumers, as workers and so on. We have explained earlier (§ 7.3) that aggregate calculations of costs/benefits alone would be unlikely to encourage large-scale efforts to implement web accessibility across the private sector, something that is already born out in the apparently slow rate of progress in this field. This aspect is taken up again later in relation to the distribution of costs and benefits across sectors and organisations within sectors. For now it serves to highlight that the problem cannot be seen merely as one of lack of awareness of a positive business case, where the policy 'fix' would be mainly in the direction of promoting more awareness. In fact, whilst more awareness of business benefits does need to be part of the policy approach it must also be recognised that our results and those of other studies[[66]](#footnote-66) suggest that for many business sectors and for individual businesses within sectors, there is unlikely to be a clear and direct business case, as such, for web accessibility. Measures as EU legislation setting up common standards for web accessibility to be complied by public sector websites can have spill-over effects towards private sector. These issues of variations across and within sectors will be discussed later, particularly in regards to variations in the affordability/reasonableness of costs at organisational level. For now it suffices to again introduce the perspectives of economics of innovation, which may apply even more strongly for the private than for the public sector. Policy approaches encouraging web accessibility across the private sector might need to consider how best to incentivise sectors and/or individual companies, for example, through grants, tax breaks or other appropriate mechanisms(although this issue is clearly outside the remit of the Commission). These issues of business case and the economics of innovation may perhaps come especially to the fore if, as proposed, the EU level approach moves to extending its scope from public administration websites to a wider range of 'public interest' websites.

* + - 1. **…Again, a need for careful presentation of the cost-benefit case for web-owner organisations**

Finally, most of the discussion above is based on our aggregate level quantitative results. There are, however, also more subtle issues for policy, which have been hinted at in the earlier discussion in relation to the costs data. In particular, the results from the survey of web owner organisations and from the cases studies conducted in this study (albeit covering small samples and not necessarily being very representative as such) suggest that cost-benefit concerns may not typically be so visible at the organisational level - many organisations (public and private) have just gone about introducing web accessibility because it was a good thing to do. Therefore, the approach to be taken as regards giving visibility to and framing the debate about cost-benefit issues needs to be given careful consideration in the policy-making and policy implementation processes. Over-emphasis on costs could introduce un-necessary impediments to the pace of progress that might otherwise be achieved if this aspect were left alone; on the other hand, on the basis of the current slow speed of progress, a policy approach based on an overly optimistic perspective on cost-benefit outcomes and a positive business case might be unsuccessful in accelerating progress in this field. Getting a good balance in this area would seem to be an important challenge for the EU policy process in the web accessibility field.

* 1. Distribution of costs and benefits across sectors/ individual organisations
     1. Policy context

Here the focus shifts from the aggregate to the more specific distribution of costs and benefits across sectors and across organisations within sectors, as well as to issues of relative cost (affordability/reasonableness etc.) at the individual organisational level. At a basic level this relates first to the issue of the possible scope of EU-level measures in this field. As currently envisaged in the roadmap, the main scope of any legislative measure would be oriented towards the public sector (in particular public administration) websites rather than the private sector, with consideration to be given towards possible later extension (and perhaps consequent blurring of the public/private distinction) to include websites of key public interest. Within an EU approach focusing in the first instance on the public administration sector, there are also a range of issues of scope, as mentioned in the Commission's roadmap under Option 3 (binding web accessibility legislation) where the initial suggestion is as outlined in the excerpt below.

**Excerpt from Commission Roadmap**

(Under Option 3 - Binding EU legislation on public web accessibility):

Individual Member States:

(...) could decide which websites they commit to render accessible.

(...) would be allowed to assess whether measures of accommodation for certain groups would impose a disproportionate burden.

* + 1. Relevant results

In relation to the more general issues of sectorial scope and distribution of costs and benefits across the public and private sectors one relevant finding is that, in the public sphere, the immediate/direct net benefit outcome ('business case') for the public administration sector overall might be somewhat negative whereas a positive and possibly substantial public sphere net benefit is calculated under most scenarios when a wider range of more down-stream (user) benefits are included. Another relevant finding was that the net benefit outcome (direct business case) for the private sector as a whole is likely to be quite negative. Yet, web accessibility efforts by the private sector (at least some sectors) are important for the achievement of the positive overall societal benefits. Finally, the possibility of substantial differences in the public administration 'business case' across Member States is also flagged in the more differentiated results.

We now look at a more fine-grained consideration of patterns in relation to costs and benefits and net cost-benefit outcomes. Of interest here are both structural patterns (e.g. across different levels of public administration, across different types of public administration organisation, across different sectors within the private sector, and across different types of organisation within a given segment of the private sector) and issues linked to more situational/process factors (such as type of website, point in the web development/re-development lifecycle, and so on).

* + - 1. **Structural patterns**

Earlier studies (Heerdt and Strauss, 2004; Leitner et al 2006; Leitner and Strauss 2008) have suggested that the net benefit outcomes at organisational level are likely to vary considerably across sectors and organisations. Factors that will affect this include the size of the (potential) target market/population as well as the importance of 'reach' for the immediate business case. It can be expected that the benefits of web accessibility (both in terms of eCommerce and also social image etc.) are likely to be unevenly distributed across different sectors. Some sectors might gain a lot of value from accessibility (e.g. large banks, large retailers, airlines, etc.), even enough to offset any costs, others might gain little or no value from these aspects. The request by the Commission to produce aggregate EU27 projections of costs and benefits, matched with the lack of granular by comparable EU27 statistics, did not enable us to look in much detail on these types of issues. This is an area to be further explored in the future but, again, not from a EU27 aggregate perspective. One additional relevant area where the work of our study, if further developed in future research, could potentially provide some useful insights is in relation to the cost-benefit issues for public administration organisations at different levels of administration (national, regional, local) within the individual Member States. This would require analysis of variations in net benefit or business case(s) across levels of public administration and/or areas of public administration at a given level, based on the actual size of the target population (which would range from the entire population in the case of national sites to perhaps just the local population of a few hundred at the local level), complexity of websites, and so on. In particular, it might be expected that lower levels of public administration could find web accessibility requirements to be especially burdensome, particularly if their services require complex sites where costs of implementing web accessibility would be higher.

* + - 1. **Situational/process-related factors**

Here the focus turns to patterns linked to variations in situational/process-related aspects such as type of website, point in the web development/re-development lifecycle, and so on. On these aspects our study results include some relevant findings, including:

* Substantial variations in costs of implementing web accessibility depending on the type/size of website
* Various details on how costing might vary depending on the level of accessibility to be achieved as well as the underpinning approach/platform for web site development, content management and so on.

The Business Case Tool Micro (BCT Micro) has been developed with a view to its utilisation at the organisational level to capture and calculate these types of costs as they apply in real-life organisations.

* + 1. Discussion

For EU policy the types of structural issues raised above need to be considered in the light of the mooted approach of EU level legislation with considerable derogation to the Member States. In this regard, further development of an evidence base on patterns of cost-benefit outcomes across sectors and across organisations within sectors might or might not be of interest/value. For the possible initial move in relation to public administration websites only the issues above could be left to the Member States to 'discover for themselves'. It could be tabled as issues that the Member States might like to take into consideration themselves in determining the scope of their national implementation and approach, or could be something that the Commission might like to do more detailed work on through further studies (e.g. in order to have some yardsticks for assessing the reasonableness of individual Member State approaches as regards scope of web accessibility obligations to be imposed across the levels of the public administration sector in the country). However, these structural issues might come more to the fore as the EU policy focus shifts towards including sectors of 'public interest' within its scope. In this case it might be more relevant for the Commission to first conduct ex ante assessments of business case patterns across such sectors in order to underpin any common obligations or guidance that might be developed for the Member States in this area. A similar analysis can be suggested for the situational/process-related factors. In fact, a full mapping of the distribution of cost-benefit outcomes across sectors and across organisations within sectors would require (matrix) analysis of both the structural and situational/process-related factors. In addition, in the context of the types of structural and situational/process-related factors discussed above, the potential usages of the Business Case Tool Micro (BCT Micro) developed in the study can also be discussed. For policy purposes it is possible to distinguish at least two possible roles for such BCT: one would be promotional and the other would be for objective evidence gathering. Consideration of the type of result that the BCT Micro in question would give at the individual organisational level is a key aspect in this. In fact, the current tool can be considered to be strong on quantifying the costs of web accessibility, with a softer more qualitative approach (and consequent 'result') in relation to the benefits side. Given this, it might not be appropriate to consider using such tool for 'promotional' purposes, in the hope that their wide dissemination would influence organisations to go in the desired direction (implement web accessibility), as the consequences might be other than intended. If such tools are to be useful for promotional purposes then they need to give the desired (and convincing) business case result for many organisations. Strengthening of the overall cost-benefit result and/or great care in its presentation would be an important issue in this regard.

For policy, there might be more value in considering such tools for purposes of objectively determining costs of web accessibility for individual organisations in a reliable manner (perhaps through their application by third parties rather than through self-assessment). If utilised in this manner such tools could have a useful role in the policy process at EU and/or Member State levels. One use might be for purposes of generating a better overall evidence base on the patterns of cost-benefit outcomes across the structural and situational/process-related factors matrix discussed above. In this case, the tools would be used to gather evidence from across a representative sample of cases covering the different organisational types, situations and circumstances. Another use might be for objectively assessing whether specific derogations (at organisational level) from web accessibility obligations are (objectively) justified on a case-by-case basis. Either way, consideration might be given to further work to strengthen the benefits side of the business case calculation at the organisational level, whether through further development of the BCT Micro from this study or through other approaches. For example, if it were suspected that many private sector organisations do in fact have a positive business case if only they would realise it, then a tool that helped them to do this would clearly be useful. More generally, this type of evidence, whether generalised (e.g. by sector, company size or other such dimensions) or produced on a case-by-case basis, would be important if financial subsidy or other forms of public incentive were to be considered as part of a policy approach that took into consideration the economics of innovation.

* 1. An equality and/or internal market issue?
     1. Context and results

The Commission's roadmap positions the web accessibility policy problem as one relating both to internal market issues (fragmentation of the digital internal market) and equal opportunities issues (digital Europe not for all). The following sections briefly present and discuss the results from the study in terms of what insights they may provide in relation to these two sources of rationale for EU web accessibility policy. Even if the conceptual and analytic approach adopted for this study not directed to provide policy impact assessment and decision-making, useful insights can be derived from the main results reported.

* + 1. Equality/anti-discrimination issues

While *ex ante* we tackled the issue of costs and benefits in a comprehensive fashion (as demonstrated by the various causal hypotheses formulated in chapter 2), our empirical results are supportive of the social agenda to promote equality of opportunities for people with disabilities, reinforcing and better documenting many of the qualitative dimensions of this that have already been frequently highlighted and accepted in the general discourse in this field and, importantly, adding some quantification (and monetisation) of the benefits that could be achieved for people with disabilities. The dimensions quantified include:

* Increased employment of people with disabilities
* Potential increases in wages for people with disabilities
* Health utility benefits as measured by QALY
* Efficiency benefits:
  + Increased convenience and saving from access to eGovernment service
  + Increased consumer welfare from access to eCommerce
  + Increased consumer welfare from access to eBanking.

Taken together the total estimated benefits connected to web accessibility for people with disabilities from these aspects add to anything between €4.6 billion and €411.5 billion across the EU27 population of people with disabilities as whole. Looked at another way, this can be viewed as a quantification of the scale of the dis-benefit (or inequality) that accrues to people with disabilities because a lack of web accessibility.

* + 1. Internal market issues

Even if the results of the study focus mostly on the equality and anti-discrimination issues, parts of the work (the case studies, the online survey of web owners and the survey of web accessibility consultancies) also touches upon internal market aspects. There are examples that show that doing cross border business implies different adaptations of web accessibility, e.g. one of the interviewers expressed the following:

* “One of our clients (a multinational company with a global website and also local ones) requested us to make the Spanish local site accessible according to:
  + WCAG 2.0,
  + UNE (Law 56/2007 is applicable to public bodies as well as private organisations dealing with public administrations and offering public interest services such as financial services, utilities or transport)
  + An internal document, written by the global site manager, in order to ensure that all local websites would be aligned with the global one”. Spain.

Even if it is difficult to clearly understand the market implications from different national standards, it should be pointed out that further harmonisation of web accessibility standards used across Member States is highly unlikely to have a negative effect on the internal market. It is worth recalling here the on-going development and publication of an EN as part of Mandate 376 that will contain the WCAG 2.0 requirements. This procurement toolkit will go some way towards promoting the use of a harmonised set of web accessibility requirements throughout Member States, although it's likely impact is difficult to predict at this stage. It is worth noting that the accessibility requirements in the EN will also be harmonised whenever possible with the new Section 508 requirements, due for publication in spring 2012. This means, in theory at least, there is the potential for increased competition between USA and European web service companies resulting from the harmonised web accessibility requirement that public procurers from both sides of the Atlantic will be specifying in their call for tenders, also giving European businesses new opportunities. Perhaps the most directly relevant results in relation to internal market issues come from the additional analysis that was conducted on the ICT services industry in Europe. This links to the Commission's roadmap in relation to issues of scope as regards who would be affected by EU action on web accessibility, where the following are mentioned:

* EU institutions and Public administration institutions at national, regional and local levels who offer websites
* Business entities offering IT services to the public authorities for remuneration
* Citizens, in particular those with disabilities

The set of players highlighted above is of most interest in relation to internal market issues about the supply of web accessibility services to web owners in Europe. To begin with, the overall results on the cost side that have already been discussed above give some indication of the potential scale of the market for web accessibility services in the EU27, with a total market size in the low billions for the public sector and anywhere up to 100 billion in the private sector if all companies were to be considered as potential clients. A more narrow approach to what websites to be covered will of course also limit the cost aspects. Data compiled outside of the formal deliverables for the study give some insights as to the nature and composition of the supply side that might compete for such business across Europe. For this purpose, it is important to note that web accessibility is not an industry in itself but in reality is perhaps best seen as a subsector within the web services industry. Although the number of companies that provide Web Accessibility services in Europe is uncertain, for the moment it seems that most of them are small, boutique firms, start-ups or just freelancers. Nevertheless, a significant number of well-known large ICT companies are apparently trying to enter in the market, as they are aware of the increasing importance of Web Accessibility and its potential. As the web accessibility market develops, perhaps fuelled by EU level policy measures, it can be expected that the supply side will include specialist web consultancies, smaller (mainly local) local ICT/web consultancies that also come to include web accessibility as part of what they offer, and larger multinational ICT/web consultancies who similarly come to include web accessibility within their portfolio of services. Some relevant aspects of the wider ICT services supply side in Europe include the fact that micro enterprises (1-9 employees) represent more than 94% of the total number of enterprises in ICT consultancy (ECORYS, 2009); micro, small and medium-sized enterprises each represent approximately the same proportions of turnover/total value added, at between 18 and 21%; and large enterprises represent about 42%. Looking more directly at internal market issues, Eurostat data (for 2004) show that the majority of ICT service companies sold their services primarily to clients in their own country of residence. Although most of the current ICT services turnover is generated in the EU15, the EU10 represent the largest annual growth rates in the EU market (fuelled by the growth in the outsourcing segments). There is also a substantial dynamism in the sector in terms of entrepreneurship/start-ups, although less so in terms of eventual scaling-up of small business and, for these, especially as regards developing the capacity to address markets in other EU countries or outside the EU.

* + 1. Discussion

In general, the direct results of the study support the equality rationale for introducing web accessibility legislation. The sizing of the potential market for web accessibility consultancy services also suggests interesting considerations and possibilities from an internal market perspective.

* + - 1. **Equality rationale**

As mentioned already in section 3.2, when the qualitative and quantitative benefits that could be made possible for people with disabilities from web accessibility are considered, not in terms of what can potentially be gained but in terms of what is currently being lost by this group because of the prevailing lack of accessibility, then the equality imperative for policy measures in this field seems very strong.

* + - 1. **Internal market rationale**

The internal market rationale for web accessibility is a bit more complex.

One side of this relates to the internal market perspective of web owner organisations (for example, online sales barriers that might arise because of different web accessibility requirements in different countries). The current evidence-base on this aspect gives positive indications, but a more focused research could have strengthened the evidence and the context.

Another side relates to the internal market perspective of the web accessibility supply sector where both the web services sector and the web tools sector need to be considered. The current evidence-base has not been fully explored in this study, and a more focused research could strengthen the positive signals seen so far.

While negative impacts from the fragmentation resulting from variations in the standards and guidelines applied nationally is not clear from the results of the research, it is reasonable to assume that increased harmonisation of the adoption of WCAG 2.0 will not harm and could potentially give very good benefits to the web services community. The web accessibility requirements to be specified in the EN as part of Phase 2 of the Mandate 365 by the ESOs will be harmonised with both WCAG 2.0 and the Section 508 refresh. European web accessibility service providers that develop and provide web services that are conformant with this EN within their own countries or to other countries in EU could, in theory, provide those same services to the US market. In addition, for both the web accessibility services and web tools aspects, the links with developments on the public procurement side also need to be given further consideration. Another point that can be mentioned here is that there are possibilities for certain tensions between different EU policy goals in this area.

As discussed earlier, in order to help keep public administration costs down in the implementation of web accessibility it might be appropriate to encourage web accessibility to be done in-house by public administrations. On the other hand, in order to develop EU internal market/competitiveness in web accessibility consultancy there might be a desire to encourage an outsourced market. To add to the potential complexity, wider take-up of web tools that included built-in support for web accessibility might help to reduce costs for public administration as well as impact on the (internal) market for such tools, but would probably then reduce the demand for web accessibility consultancy services. Against this background, there might be some value to be gained for the EU policy process from looking at approaches being elaborated in the area of using public procurement to drive innovation. These can provide pointers to how EU policy could be crafted in a way that would help 'win-win-win' outcomes to be achieved for people with disabilities, public administrations and the web accessibility consultancy and/or web tools industries.

* 1. Some other relevant results from MeAC2

Finally, for completeness, it is also useful to briefly present some key results from the MeAC2 and other previous studies that are potentially relevant for guidance of policy in the web accessibility field. These relate in particular to the consideration of legislative or non-legislative options at EU level. In MeAC2, results of the analysis of the associations between policy approaches and levels of achieved public website accessibility across 13 Member States and 4 other countries show that the component of web accessibility policy most strongly linked to positive web accessibility status results is the strength of provisions (legislative or other obligations) that specifically require the relevant stakeholders to ensure web accessibility. This result is consistent with the results of the earlier MeAC1 study[[67]](#footnote-67). The patterns in this regard from the MeAC2 study are shown in the following chart.

Figure 17: Policy Provisions against government websites accessibility status

Policy provisions (legislative or other obligations) requiring web accessibility against government websites accessibility status.  The figure shows there is a positive correlation between the government web accessibility status score and web eAccessibility policy provisions score.

Source: MeAC2 (2011) data. European countries.

The fact that wide variations continue to prevail across the Member States in whether such obligatory provisions exist and, where they do exist, in the strength of the provisions, would be supportive of the need for the adoption of legislative approaches at EU level if web accessibility goals are to be progressed across the EU 27. In addition, the results of the MeAC2 study and also the previous MeAC1 study suggest that best results are achieved where a combination of strong legislative provisions and accompanying measures such as certification and monitoring are in place.

Therefore, if an EU legislative approach is implemented it might be appropriate to encourage both legislative measures in the Member States and also accompanying measures to reinforce the impacts of such legislation.

* 1. Concluding remarks

The previous chapters in this deliverable have presented the key results coming from the study and discussed the implications of these for possible EU policy making in the future. In this chapter we first draw some key overall policy implications and conclusions and then present the various more detailed policy conclusions that have been elaborated in the other chapters of the report. Finally we provide a list of more specific policy options open to the Commission in line with these conclusions and framed within the policy options contained in the Commission’s roadmap "Web accessibility Action Plan".

* 1. Some key overall conclusions

The following are some key overall conclusions that can be drawn from the work of the study:

* The evidence generated from the study provides additional support for the overall value case for web accessibility. Widespread accessibility of web sites would be likely to yield very substantial benefits for people with disabilities, for older citizens and in general terms, for any person in a temporary constrained situation (e.g. people with a broken arm after an accident, people with slow internet connections, etc.) as well as for the common good (both social and economic) in Europe as a whole.
* The case for strong policy on web accessibility based on the equality rationale seems clearly to be supported by the results of the study. The current low levels of web accessibility contribute to disadvantaging people with disabilities in ways that, when quantified and monetised in the manner done in this study, can amount to large amounts of economic disadvantage for them.
* Based on the calculations made in this study, the direct business case through efficiency gains and/or eCommerce gains for the web site owner organisations (public administrations and private sector) are likely to vary quite substantially across sectors and across organisations within sectors. Because of this, it seems unlikely that widespread implementation of web accessibility will occur 'naturally', with the result that the 2015 target of full accessibility of public sector web sites and those providing basic services to citizens that is contained in the Digital Agenda for Europe will, in common with previously set targets, remain unmet. Encouragement will be needed through policy measures that impose reasonable obligations on the respective sectors and organisations within sectors, possibly complemented by incentives in cases where this is deemed to be necessary and appropriate.
  1. Summary of more detailed policy implications and conclusions

This section presents a summary of the more detailed policy implications and conclusions that have been drawn in the various sections of the report. The policy implications and conclusions are organised in terms of the main themes in the analysis and presentation of results:

* aggregate user benefits
* aggregate web-owner organisational benefits
* aggregate web-owner organisational costs
* aggregate cost-benefits (business case) for web-owner organisations
* distribution of costs and benefits across sectors and organisations
* the equality and the internal market issue
* relevant results from other studies.
  + 1. Aggregate user benefits
       1. **Scale of the potential user benefits supports the case for policy measures**

The scale of the aggregate user benefits from web accessibility that have been calculated in this study provides strong support for policy measures aiming to ensure widespread accessibility of websites across the EU. Some of the potential user benefits could be achieved directly from web accessibility policy measures, per se. For other more downstream user benefits, web accessibility policy measures would make an important contribution but achievement of the outcomes would also be contingent on policy efforts in other fields such as education/skills.

* + 1. Aggregate web-owner organisation benefits
       1. **Aggregate directly quantifiable benefits from web accessibility are not especially large; benefits in the areas of Corporate Social Responsibility or improved social image may be equally or more important**

At the aggregate level, the estimated scale of the direct quantifiable benefits for organisations from implementing web accessibility would not seem sufficient, on its own, to provide a very strong rationale for policy measures aiming to ensure widespread accessibility of public and private websites across the EU. If it is planned that future EU policy measures will include promotional activities aimed at web owner organisations, there will be a need for careful construction and presentation of the benefits case. For many organisations, this may be more in the domains of Corporate Social Responsibility (CSR) and improved social image rather than harder and more directly quantifiable benefits.

* + - 1. **Estimated aggregate costs for implementing web accessibility across the EU27 are quite large, but a more differentiated perspective is needed for policy**

The estimated aggregate costs for implementing web accessibility across the entire complement of public and private websites in the EU27 are quite high. However, a more differentiated perspective on costs is likely to be more useful for informing EU policy making, especially taking into account relative rather than absolute costs and how benefits may offset costs in different sectors and organisations.

* + - 1. **Costs are likely to be lower if more web accessibility work were done in-house, but the impacts on the web accessibility services markets needs to be considered**

The cost calculations developed in the study are based on a scenario where all web accessibility work is outsourced by web-owner organisations. If web-owner organisations had the desire and capacity to do this work in-house, then costs for them could be expected to be considerably lower. One possibility for consideration in EU policy making, therefore, would be to introduce measures aiming to increase the capabilities of web-owner organisations to implement web accessibility through in-house work – e.g. through training or by enforcing public procurement of accessible ICT and increasing awareness about accessibility. One consideration for such an intervention is its possible impact on providers of web accessibility services which would also need to be assessed. However increased demand by public sector organisations for web accessibility in public procurement and training of staff would likely also increase the demand for web accessibility services.

* + - 1. **Costs vary in complex ways linked to web management processes and design/re-design cycles; some aspects of web accessibility could be addressed without waiting for an entire re-design**

There are complexities in estimating how costs vary with different approaches to web management processes in web-owner organisations. However, it is clear that the work involved and the associated costs of making already existing websites accessible will vary considerably, depending on the technologies used, how the site has been designed and other such factors. In many cases the effort to retrofit accessibility in a complete manner may be quite substantial. However, the on-going creation and publication of content in accessible PDF and other formats is most likely to be a separate and distinct process that could be more quickly and readily addressed. Alternative formats to PDFs such as ePub should be encouraged however not all people agree with this because:

* As its name suggests, ePub is a publishing format using a system of marking content, aside from the format, which allows multiple devices to be submitted without any restrictions occur in the screen size, resolution, etc. It is based on open standards, so that everyone can use it, however, they must have the knowledge on how to use it;
* It is doubtful that the globally widespread PDF format, with many possibilities to be generated and read freely, would ever lead to extinction. Unlike ePub, PDF format can include a layer format. It allows you to add a layer to the structuring of content (which allows it to be accessible), including the presentation layer, the purpose for which it was designed;
* Precisely for that reason it is doubtful that its use is terminated, as many companies look for documents, books, and presentations that are easy on the eye (with colours, images, design...) to grab the reader’s attention. For example, it is not wise to launch an advertising document in only plain text;
* ePub files, although rampant on devices such as eBooks and eReaders, is not used in all desktop applications, so the user would have to install a specific application. Interpreting and using these files from a desktop standard is not intuitive at all for a novice user. (Think of the applications that come on a CD when you buy a new device);
* As to whether being accessible or not, theoretically, including a normally accessible XML (Extensible Markup Language) file, one must remember to allow applications that permit viewing. An eBook device is not accessible, except to read text aloud. And to open an ePub application on a PC or Macintosh, accessibility will be near zero;
* The accessibility of the ePub reader depends on the device. Unfortunately the accessibility of the devices is not widespread. PDFs have greater insight into a greater number of devices; in fact, there are instances of use of maximum accessibility e.g.: iPad + PDF accessible, affordable PDF + JAWS, etc.;
* There are not that many alternatives to PDFs. The key is the wide variety of applications that can be used to generate PDFs (Word, WordPad, QuarkXPress, Adobe, etc.) Being able to generate an ePub document has been through the device's own Sony software, which is a complex procedure.

Adapting format may not be so good because so many people use PDFs, but sometimes the PDFs are not well formatted because people are not using standardized tools to make the right PDFs in terms of accessibility. Investing in a form of storage that can produce accessible PDFs on demand is something that might be considered as well as in the context of specifying implementation timeframes for web accessibility in any policy intervention.

* + - 1. **Variations in costs across the Member States**

According to the more detailed underpinning calculations produced by the study, the estimated absolute and relative total costs for achieving web accessibility across the Member States vary substantially. One factor that influences overall costs at Member State level is the extent of decentralisation of public administration and there are substantial variations in the numbers of smaller local level administrative units across the Member States. These and other aspects of variations across the EU27 may need further consideration.

* + 1. Aggregate cost-benefits (business case) for web-owner organisations
       1. **Negative aggregate cost-benefits suggest that incentives may need to be considered**

According to the calculations made in this study, the aggregate yearly net benefits (the direct ‘business case’) for the EU public administration sector (taking its costs and its own efficiency gains in account) and for the private sector (taking its costs and its own eCommerce gains into account) are negative in both cases. This raises the possibility that provision of incentives for web owners to implement web accessibility might need to be considered in the context of the development of the policy approach. The scale of the societal level benefits that can be achieved from web accessibility would seem to justify this even if more differentiated data on costs and benefits for different sectors and different organisations within sectors could give new information.

* + - 1. **Focus should not be placed only on the business case**

The survey of web-owner organisations and the case studies conducted in the study suggest that most organisations that have implemented web accessibility have not given much attention to systematically assessing the direct business case for this. Given this, and in the light of the possibly negative direct business case for many organisations, focus should not be placed only on the business case in the context of policy approaches aiming to encourage web accessibility efforts.

* + 1. Distribution of costs and benefits across sectors and organisations
       1. **A possible need for further analysis of how costs and benefits, and the overall business case, vary across sectors and organisations**

The main focus of the economic analyses in this study has been at the aggregate level of the EU27 and at the aggregate levels of the public and private sectors as whole. This level of analysis does not provide much insight into differences in cost-benefits and business case within these aggregate sectors, for example, at different levels of public administration, in different business sectors and in organisations of different sizes. There may be a need for the European Commission to conduct further analyses of how costs and benefits, and the overall business case, vary across sectors and organisations. Aspects that might need to be examined further across the Member States include patterns of cost benefit outcomes for different levels of public administration and for the private sectors providing services of 'public interest.'

* + - 1. **The business case tool could support this and also have other applications in the policy context**

The type of Business Case Tool Micro (BCT Micro) developed in this study could be useful for purposes of generation of this type of data in support of EU level and/or Member State policy approaches in this field. One usage could be in studies aiming to generate profiles of business case patterns across different levels of public administration, business sectors, company sizes or other such dimensions. Another usage could be for application on a case-by-case basis with individual organisations in order to assess possible justification for financial support or other forms of incentive for implementing web accessibility.

* + 1. The equality and the internal market issue
       1. **Equality/anti-discrimination rationale**

The direct results of the study support the equality/anti-discrimination rationale for introducing web accessibility legislation. This is emphasised when the benefits that people with disabilities would gain from web accessibility are considered as reflecting the dis-benefits that they currently experience because of a lack of web accessibility.

* + - 1. **Internal market dimension**

The nature and extent of an internal market rationale for web accessibility is maybe a bit more complex. On one hand, the large size of the potential market for web accessibility consultancy services as calculated in this study suggests that internal market issues in this sector may justify further attention in the development of EU policy in this field. But it could be are possible tensions between policy objectives aiming to keep public administration web accessibility costs down whilst also seeking to stimulate the European market for web accessibility services. Other EU efforts in the field of public procurement of innovation might provide further helpful insights for policy in the web accessibility field in this regard.

The possible impact on the harmonisation of the American and European standards on ICT accessibility give increased opportunities for European web accessibility companies to sell services in the United States, but also the other way around.

* + 1. Some relevant results from other studies
       1. **EU level measures to encourage implementation of strong obligatory requirements by the Member States would be likely to give best results**

The evidence shows that the best results are being achieved in Member States that have implemented strong obligatory requirements on web accessibility. However, there is wide variation across the Member States in whether such obligatory provisions are in place and in the strength of the provisions where they exist. Such findings would be supportive of a need for EU level measures to encourage better achievement of common web accessibility goals across the entire EU27.

* + - 1. **Accompanying support measures are also important**

The evidence also suggests that best results are achieved where a combination of strong legislative provisions and accompanying measures such as certification and monitoring are in place. Therefore, if an EU legislative approach is implemented it might be appropriate to encourage both legislative measures in the Member States and also accompanying measures to reinforce the impacts of such legislation.

* + - 1. **Elaboration of the policy options set out in the Roadmap "Web accessibility Action Plan".**

This final section recalls the four policy options set out in Section C of the Roadmap and provides additional specific options under each based on the findings and conclusions of the study to date.

* Policy option 1: Proceed with *status quo*
* Policy option 2: Adoption of a Recommendation

Neither of these options seems to be in line with the Digital Agenda for Europe to bring forward a proposal on web accessibility and contained implicitly in the Disability Action Plan to propose an Accessibility Act. The available evidence in the MeAC 1 and MeAC2 studies suggest that the impact from the previous recommendations in 2000, 2005 and 2008 has been limited.

* Policy Option 3: Proposal by the Commission of a legally binding measure – Directive – specifically on web accessibility.

The scales of the aggregate user benefits from web accessibility that have been calculated in this study provide support for an equality/anti-discrimination measure and for an internal market measure.

* + - 1. **Scope of websites to be covered in a directive**

The scope of websites to be covered would need careful consideration and require close consultation with different stakeholders. While the estimated aggregated costs of implementing web accessibility are high, further research may be required to differentiate these costs among certain sectors. This could help inform the identification of priority sectors such as key government services that engage in complex transactions with citizens and key private sector of public interest to receive priority treatment in a Directive.

* + - 1. **Timelines**

The indicative timeline of 2015 contained in the DAE may require further consideration given that certain sectors may be more prepared, have already started work on and may be more motivated to implement web accessibility than others.

A more immediate timeline may be desirable for new websites from priority sectors to be made accessible. The new European toolkit for accessible ICT under Mandate 376, due to be finalised in September 2013, will provide a resource for organisations procuring new websites and a requirement for its implementation and use by organisations in procuring new websites could be considered for inclusion in any new legislation.

For existing websites the establishment of timelines is more complex and further research into the situation within various sectors could inform what is achievable over what timeframe. However, as already discussed, certain web content development and publication processes such as the publication of standalone PDFs and content in audio and video may be more easily made accessible than for example content developed and published to a website through a CMS that may not support accessibility. Therefore timelines for requiring older websites to be accessible may need to consider this variety of factors. One possibility for consideration in consultation with Member States and other stakeholders is a website accessibility plan to be developed by website owners providing information on such things as the current website’s level of accessibility, details for users requiring assistance in accessing currently inaccessible content as well as timelines and plans for improving the website’s level of accessibility.

* + - 1. **On-going monitoring and development of the business case**

To inform both the effectiveness of the Directive and its future development it is desirable that patterns of cost benefit outcomes for different levels of public administration and for the private sectors providing services of 'public interest' continue to be researched and monitored. To this end the Business Case Tool Micro (BCT Micro) developed in this study could be useful for generating this type of data by the EU and/or Member States and a requirement for its use could be considered for inclusion in the Directive.

* + - 1. **Harmonisation of approach to monitoring and conformance assessment of web accessibility**

Given the wide variation across the Member States identified in the MeAC 1 and MeAC 2 studies on how web accessibility is implemented and also measured in Member States, the Directive could address establishing a harmonised approach to assessing conformance with the international standards. Commercial effects resulting from the harmonisation of European and American web accessibility requirements has not been the core of this study, but could be an issue for further considerations.

1. Conclusions

In the course of 18 months of work we have produced a large set of outputs ranging from theory, empirical evidence, analytical tool, and policy implications. In doing so we have produced important new evidence or re-used in insightful fashion scattered facts to better inform the policy debate on eAccessibility, produced some useful tools, reached a number of policy relevant conclusions, and identified areas where further research and evidence is needed. Before recalling key findings and presenting policy recommendations, a disclaimer is in order at this final stage.

* 1. Disclaimer

In the paragraph on the methodology we have listed a number of shortcomings we encountered as regard the state of the art of existing evidence. We recall them briefly below:

* **Non-consolidated scientific literature**. In general the scientific and empirical literature on the causal impacts of eAccessibility is limited and we had to apply by analogy hypotheses and evidence from indirectly relevant fields (i.e. literature on the impact of ICT skills on the labour market or socio-economic analysis of accessibility in general);
* **Little scientific evidence on organisational costs and benefits**. In comparative terms the sources on the benefits for individuals with disabilities are more numerous and of higher quality than those on organisational level costs and benefits. Indeed for this respect it is worth quoting what is stated in one recent article on the topic: “*The issue of Web Accessibility has gained little attention in the area of economics and business so far even though its implementation especially in organisations of the private sector justifies also business and management research to be considered*” (Leitner & Strauss 2008, p. 490) and again later: “*An extensive literature research in the field of Web Accessibility revealed various technical studies about Website accessibility evaluation but very few studies on business and managerial benefits of Web Accessibility*” (Ibid, p. 493). In particular on the organisational costs of eAccessibility there are practically no reliable scientific sources and one can find controversial claims (costs being very small or very high) in institutional reports and practitioners’ generated content. In this respect our field-work enabled us to start filling this gap on costs.
* **Lack of EU27 comparable statistical datasets**. Whereas solid EU level datasets are available on the socio-economic situations of PwD (see Annex 1.1) they cannot be matched with EU27 statistics on PwD level of digital inclusion, usage of the Internet for different purposes etc. All we know at EU aggregate level about PwD and the Internet is only the general percentage of those accessing the Internet in 2002 from a Eurobarometer survey. In addition there is lack of a series of other data that would be needed for treating the topic of eAccessibility impacts through the application of formal quantitative statistics and econometrics techniques (See Annex 2.1, §2.4)

In conclusion, we want to stress that the limits evidenced above suggest that the reader take with some caution the final implications and policy recommendations we draw from our work. It is evident that more work is needed to advance our understanding of the issues at hand. More in general, the set of issues and evidence discussed and presented in this report are not exhaustive. It is entirely possible and even desirable that others will be stimulated to identify additional ones. As there are no simple black-and-white answers to be found some might also challenge parts of the commentary and analysis done in this report. There is a need for a better understanding of the economic aspects of web accessibility and every argument that can contribute to this and to better data, in order to underpin necessary policy decisions, is welcome.

Having clarified the above, below we first summarise the key findings in terms of evidence and the main tools delivered, and then we move to present the main recommendations for future research and evidence gathering activities and for policy measures. In this respect, whereas section 7 we looked at the implications of the study from a strict economic perspective and in through section 8 from a policy perspective, the policy recommendation presented in this conclusive section integrate these two perspectives matching them to the underlying evidence.

* 1. Evidence

Level of eAccessibility is clearly lagging behind the target set in Riga in 2006 and at the current pace the target of the Digital Agenda for 2015 will not be reached;

* This situation risks to digitally exclude as many as 110 million Europeans between persons with disabilities and older persons;
* Data from the 2002 Labour Force Survey ad hoc module show that persons with disabilities are already on average at a clear disadvantage (in terms of employment status, income, educational level) and lack of eAccessibility is further exacerbating this condition;
* As a matter of fact these persons are foregoing many of potential benefits deriving from ICT and economy and society as a whole is missing aggregate benefits and paying avoidable social costs;
* We estimated that, under full implementation of Web Accessibility and coordination with other social policies, benefits for the users (the measure of aggregate social gain) in EU27 can reach up to the sizeable sum of €411.5 billion;
* Summing up such user benefits to the potential benefits accruing to private sectors web owners (from increased use of eCommerce and/or eBanking) and to public sector ones (efficiency gains switching from face-to-face to online service provision) the total aggregate benefits can reach up to €413 billion;
* While the aggregate EU27 organisational costs of introducing web accessibility for both private and public sector range in the order of €2.39 billion, they are offset by the benefits;
* Dynamic net present value calculations show that in most scenarios the net benefits from full web accessibility turn positive in a few years;
* At aggregate EU27 level the net benefit only for organisations remain negative under most scenarios, although such aggregate calculations should be seen in context and also in relative terms: such costs would amount only to 6% of total administration ICT spending and to 16.2% of total private sector expenditure in ICT
* As a matter of fact organisations surveyed though a questionnaire or analysed with in depth case studies reported overall satisfaction with their efforts to introduce web accessibility, did not encounter main complexities and difficulties, and deemed the costs to be affordable.

In more general terms and in relation to the policy implications the evidence on costs and benefits of Web Accessibility suggest:

* Support to the equality/anti-discrimination rationale for introducing web accessibility legislation, as demonstrated by the large size of the potential benefits for people with disabilities from web accessibility, which reflect the dis-benefits that they currently experience because of a lack of web accessibility;
* Negative aggregate cost-benefits for EU public administration sector and for the private sector suggest that several possible policy measures are needed (both obligation and incentives), which could be justified by scale of the societal level benefits that can be achieved from web accessibility;
* Shows that the internal market rationale is important. On one hand, comprehensive policy measures could tear down market barriers and fragmentation and reduce the costs of web accessibility (competitive internal market for accessible ICT products and services), but some short term extra costs on public and private organisations may be added;
  1. Analytical theoretical and practical tools
* The causal model developed, on the basis of the most extensive and updated review of the relevant literature to date, have identified a large number of causal relations as to the potential impact of Web Accessibility that future analysts and researchers may improve and re-use for their purposes;
* From this model we extracted about 30 operationalised key aspects (costs-benefits items) for future re-use by practitioners, researchers, and policy analysts;
* We produced the first empirically grounded estimation of the extra-costs attributable solely to Web Accessibility and embedded this into one of the interactive excel base Business Case Tool that web owners can use in the future to assess ex ante or ex post their web accessibility activities and investments;
  1. Direction for further research and evidence building
* There is a clear need for measuring level and purpose of Internet usage for persons with disabilities in EU27. In our study we had to rely only on a mere aggregate EU15 figure from a Eurobarometer report dating back to 2002;
* More research is needed to discover sector differences on benefits from web accessibility The focus should not be on producing EU27 aggregate figure (which is impossible at a granular level in terms of sectors), but rather to have parameters from different sectors and sizes in different countries. We have attempted this but great difficulties in getting detailed enough data on the side of organisations prevented us from achieving it. For future work it is recommended that a group of analysts spend some time at the location of each selected organisation in order to build the evidence together with its representatives;
* The same more in depth analysis at organisational level by size, sector, and country is needed for the costs of web accessibility;
* It would also be the source of new insights to conduct well designed and in depth ex ante and ex post impact evaluations under well defined, specific, and controlled conditions. For instance select a number of comparable organisations in comparable local setting that are about to implement web accessibility and gather all relevant data ex ante (before the web accessibility intervention) and steadily while the intervention is carried, as well as ex post when the intervention is operational. The gathering of such data should concern both the organisations and their respective target audience. The careful selection of the different organisations (in terms of size and sector) and of different localities (in terms of population structure, socio-economic conditions, prevalence of disability) would enable to determine whether Web Accessibility had an impact and to quantify it;
* Impact evaluation and data gathering on costs and benefits should be made a requirement and embedded in future horizon 2020 projects and CIP Pilots focussing on eAccessibility;
* Studies or research should look into the more consolidated and established field of Health Technology Evaluation and explore the mainstreaming of techniques such as the measurement of Quality Adjusted Life Years (QALY), which we piloted in this study for the first time, in the field of eAccessibility.

In conclusion, we want to stress that we think it is highly unlikely that the set of issues and evidence discussed and presented in this report are exhaustive and, indeed, it is entirely possible and even desirable that others will be stimulated to identify additional issues and even, perhaps, to disagree with parts of the commentary and analysis. We would not be defensive about this, for there are no simple black-and-white answers to be found but rather there is a need for a better understanding of the economic aspects of web accessibility in order to underpin policy decisions on what would be best to do and how best to go about it to achieve common goals in relation to web accessibility whilst minimising the likelihood of untoward, negative collateral consequences.

* 1. Policy implications and recommendations

We have reached several conclusions that are useful as to how the evidence produced can be used to inform and develop policy measures. We have done this applying both the perspective of the economics of innovation (since we consider the introduction of web accessibility as a form of social innovation) and a policy-oriented perspective.

* + 1. Economics of innovation perspective

Innovation is spread if its relative advantage is clear and widely known and visible, hence there is space for further awareness raising and capacity building as to the costs and benefits of web accessibility;

* Besides relative advantage and strict economic incentives, innovation may spread as a result of peer pressure and social influence, hence there is space for: a) conformance assessment/certification/labelling to harness mechanisms of legitimacy and peer pressure***,*** also mainstreaming eAccessibility as part of CSR frameworks; b) champions campaigns.
* The behaviour and decisions of individuals organisation are taken at the micro level of economic rationality, hence our aggregate EU27 projections of costs and benefits will have no impact in changing their decision to invest or not into web accessibility and policy measures are needed to change the current situation of low web accessibility;
* There are no policy measures that can impact the net cost/benefit ratios for organisation by acting on increasing the revenues from Web Accessibility. At any given point in time purchasing power and demand are fixed, while consumption and online use of services are rival (there is only a limited monetary budget one can spend in eCommerce and there is only a limited time budget one can spend using online government services).
* The costs/benefits ratio for organisations can be changed through direct financial incentives conditional on investments into web accessibility (tax breaks, accelerated amortisation, etc.), yet these measures are a matter of Member States decisions.
* The only way that EU level interventions can change such ratio is by way of a coordinated approach that would create an effective internal market for accessible ICT products and service, thus, lowering the costs for web owners willing to make their websites accessible.

In view of the above:

1. There is still a need for awareness raising and capacity building in the field of eAccessibility costs and benefits measurement;
2. There is need to push conformance assessment/certification/labelling to reinforce peer pressure, also mainstreaming eAccessibility as part of CSR frameworks;
3. There is need for accompanying measures such as champions campaigns;
4. Aggregate projections of costs and benefits per se cannot change the behaviour of organisations, a variety of policy measures are needed to increase Web Accessibility beyond the levels in 2010 and 2011 by MeAC;
5. The size of benefits organisations may realise by making their website accessible depends on systemic factors that cannot be impacted by policy measures;
6. Direct financial incentives can help further deployment of Web Accessibility and, although they are outside of the EU remit, the Commission may discuss them with Member States;
7. Non-legislative procurement incentives adopted in some Member States could be mainstreamed at EU level in addition to the public procurement initiatives currently under way.
8. A systematic EU intervention in coordination with Member States can eliminate market fragmentation and barriers, which would result in lower Web Accessibility costs.
   * 1. Policy perspective

* The evidence generated provides additional support for the overall value case for web accessibility; widespread accessibility of websites would be likely to yield very substantial benefits for people with disabilities and others affected, as well as for the common good (both social and economic) in Europe as whole;
* The case for strong policy on web accessibility based on the equality rationale seems to be supported by the results of the study; the current low levels of web accessibility contribute to disadvantaging people with disabilities in ways that, when quantified and monetised in the manner done in this study, can amount to large amounts of economic disadvantage for them;
* Based on our calculations, the direct business case through efficiency gains and/or eCommerce gains for the web owner organisations (public administrations and private sector) that must implement web accessibility vary quite substantially across sectors and across organisations within sectors;
* Because of this, it seems unlikely that widespread implementation of web accessibility will occur 'naturally' resulting in the 2015 target of full accessibility of public sector websites and those providing basic services to citizens contained in the Digital Agenda for Europe will, in common with previously set targets, remain unmet; encouragement will be needed through policy measures that impose reasonable obligations on the respective sectors and organisations within sectors, possibly complemented by incentives in cases where this is deemed to be necessary and appropriate.

These two perspectives are mapped synoptically on to the relative evidence as a way to summarise the rational for the 5 policy recommendations presented after the table. Each row in the table indicate which policy recommendation out of the five is supported by which evidence.

Table 30: Mapping of Economic and Policy perspectives

| **Evidence/support to recommendation (R plus #)** | **Economics of Innovation perspective** | **Policy Perspective** |
| --- | --- | --- |
| *Large benefits for individuals with disability* ***(R1 and R2)*** | *Need of coordinated policy efforts across different domain (INFSO, EMPL, ENT) to maximise user benefits* | *Support for equality/anti-discrimination rationale for introducing web accessibility legislation* |
| * *Little awareness and measurement capacities on WA costs and benefits among organisation* ***(R5)*** * *Innovation spread through social influence* ***(R5)*** | * *Need for awareness raising and capacity building in the field of WA costs and benefits measurement among public and private sector organisations* * *Need for accompanying measures such as champions campaigns* | *A combination of strong legislative provisions and accompanying measures is most effective* |
| *From questionnaire and case studies there emerge clear importance of WA for social image* ***(R4)*** | *Push conformance assessment/certification/ labelling to reinforce peer pressure, also mainstreaming eAccessibility as part of CSR frameworks* | * *While aggregate directly quantifiable benefits from web accessibility are not especially large, benefits in the areas of Corporate Social Responsibility or improved social image may be equally or more important* * *A combination of strong legislative provisions and accompanying measures is most effective* |
| **Evidence/support to recommendation (R plus #)** | **Economics of Innovation perspective** | **Policy Perspective** |
| *Other Procurement measures* ***(R3)*** | *Non-legislative procurement practices could be mainstreamed at EU level in addition to the public procurement initiatives currently under way* | *A combination of strong legislative provisions and accompanying measures is most effective* |
| *Negative aggregate costs/benefits for organisations* ***(R1 and R2)*** | * *Aggregate projections of costs and benefits per se cannot change the behaviour of organisations* * *Size of benefits organisations may realise by making their website accessible depends on systemic factors that cannot be impacted by policy measures* * *A systematic EU intervention in coordination with  Member States can eliminate market fragmentation and barriers, which would result in lower Web Accessibility costs* * *Direct financial incentives can help further deployment of Web Accessibility and, although they are outside of the EU remit, the Commission may discuss them with Member States.* | * *Aggregate costs/benefits vary quite substantially across sectors and across organisations within sectors. Because of this, it seems unlikely that widespread implementation of web accessibility will occur 'naturally', with the result that the 2015 target of full accessibility of public sector web sites and those providing basic services to citizens that is contained in the Digital Agenda for Europe will, in common with previously set targets, remain unmet* * *The evidence shows that the best results are being achieved in Member States that have implemented strong obligatory requirements on web accessibility.* |

* + 1. Policy recommendations
       1. **Binding and/or hard measures**
          1. **Propose a legally binding measure – directive- specifically on web accessibility**

**Rationale**: This is option 3 of the Roadmap and is evidently preferred to Option 1 and 2, in view of the facts that: a) only some strong obligatory measures have been shown to be effective in furthering the deployment of web accessibility; and b) it is unlikely that organisations will implement WA spontaneously given the evidence and the economic reasoning we have produced; c) a strong and coordinated approach can create an internal market of accessible ICT product and services and lower the costs of accessibility; d) the costs imposed by this measure will be more than compensated by the benefits to individuals with disability (equality/anti-discrimination rationale) and by gains in terms of internal market. It is the best case of imposing private costs to achieve larger public and social benefits.

* + - * 1. **Preliminary discuss with member states the issue of direct financial incentives and subsequently issue a white paper or recommendation on the topic**

**Rationale**: Incentives conditional on investments into web accessibility can change the negative costs/benefit ratio perceived by organisations and further stimulate deployment of Web Accessibility. Their costs can be compensate by the earlier mentioned benefits for individuals with disabilities, as well as by the boost to the market for accessible ICT products and services that will generate additional tax revenues.

* + - 1. **Accompanying softer measures**

The common rationale for all the recommendations listed below is that Accompanying support measures are also important. The evidence suggests that best results are achieved where a combination of strong legislative provisions and accompanying measures such as certification and monitoring are in place. Therefore, if an EU legislative approach is implemented it might be appropriate to encourage both legislative measures in the Member States and also accompanying measures to reinforce the impacts of such legislation.

* + - * 1. **Propose a recommendation on procurement incentives**

**Rationale**: An alternative and more promising way of changing the structure of incentives, although limited to the public procurement process, is exemplified by a practiced adopted in the Spanish action plan for the Information Society “Plan Avanza”. Plan Avanza tender specifications state that part of 20% of total eligibility criteria would be given to those participants whose websites were accessible. This is an interesting way of creating an incentive that ties potential revenues to web accessibility.

* + - * 1. **Push conformance assessment/certification/labelling to reinforce peer pressure, also mainstreaming eAccessibility as part of CSR frameworks, by for instance:**

1. Collaborate with DG SANCO, DG EMPL, and DG ENTR on the issuance of a white paper or communication calling for the mainstreaming of eAccessibility as one of the key components of Corporate Social Responsibility in the EU27
2. Establish, possibly in collaboration with some of the other DGs mentioned above, a EU27 Web Accessibility ‘two thick accreditation schemes’ (along the lines of the UK practice) and a related and widely market Awards programme;
3. Call the Member States to link such accreditation schemes with additional (as a sort of prize) funding to public sector organisations achieving excellence;
4. Issue, in collaboration with some of the other DGs mentioned above, a European ‘Code of Conduct’ for the treatment of eAccessibility issues within private and public sector organisation

**Rationale**: Peer pressure and social influence are among the driver that can lead organisations to adopt Web Accessibility. We found the encouraging evidence that many organisations already perceive Web Accessibility as a positive contribution of their social image and as part of their Corporate Social Responsibility (CSR), which should be leveraged. Aggregate EU monitoring through benchmarking is important and should be continued, but it is not sufficient. Yet, Web Accessibility has not yet been mainstreamed as a component of CSR, whereas certification and other conformance solutions are not very widespread across EU27.

* + - * 1. **Launch awareness raising, champions, and capacity building measures such as:**

1. Dissemination through ePractice and other channels, the main findings of this and of other relevant studies. In particular disseminate most interesting case studies (showing results, satisfaction, that the introduction of Web Accessibility is not complex and is compatible with organisations’ value, practices, stakeholder base);
2. Create self-standing and ad hoc Web Accessibility Awards (on the model of the eGovernment Awards celebrated at each ministerial conference)
3. Use various channels to spread among SME and public sector organisations the capacity for producing ex ante evaluation, subsequent monitoring, and ex post analysis of the costs and benefits of eAccessibility. This can be done, for instance, by: funding benchlearning pilot studies for involving several organisations engaged into a collaborative process of application of the Business Case Tool produced by this Study Consortium; Making the usage of the Business Case tool (or of any other equivalent too) mandatory for all framework programme projects and CIP pilot funded in the domain of eAccessibility; Extracting from this Study Consortium’s Business Case Tool a short checklist to be put online on ePractice and request all case owners in the field of eAccessibility to use it.

**Rationale**: We observed little awareness and measurement capacities among organisations for what concerns costs/benefit of Web Accessibility, yet having evidence both from other cases and generated internally is fundamental to drive and sustain Web Accessibility. We have also noticed that many organisations are satisfied with their own investments into Web Accessibility and did not encounter dire complexities and difficulties, which should be made known to other organisations to demystify the idea that introducing Web Accessibility is complex and extremely difficult. In addition to this supporting Champions campaign can trigger process of social influence through networks and processes of imitation.

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Annex 1: Statistics to Quantify the Target

The quantification of the potential target of individuals potentially benefitting from IWA is a fundamental general parameter and, above all, is the starting point for the quantitative projection of potential user level benefits. However, before entering in the details of the sources available a very first and important methodological premise is of great importance here. We choose to use internationally compiled and comparable statistics, rather than country level data as we decided that they are more reliable. The sources we discuss below come from surveys centrally administered for all EU27 Member States by Eurostat with a common methodology and sample and also based on self-reporting by the individuals interviewed. While we do not claim that these dataset are perfect and immune to measurement errors, they nonetheless ensure homogeneity across countries and avoid using data that reflect countries peculiarities and differences in the classification of disabilities and diseases. Using national level statistics and then processing them for our purpose of aggregate EU27 projections would amount to adding together ‘apples and pears’ and would bias our results many-fold more than the inevitable measurement errors contained in the international surveys from which we take the data on prevalence of disability.

* 1. Overview of available resources
     1. ECHP

The first source of reliable data on the prevalence of disabilities among Europeans (in EU15) comes from the Eurostat administered 1996 wave of the European Community Household Panel (ECHP), subsequently substituted with the EU-SILC (see infra) also administered by Eurostat. In the ad hoc module on disability introduced in the 1996 ECHP third wave the following two questions were asked in 14 of the EU15 (Sweden was not included):

* Q 158: Do you have any chronic physical or mental health problem, illness or disability? If Yes ➩Q 159
* Q159: Are you hampered in your daily activities by this chronic physical or mental problem, illness or disability? Yes, severely/Yes, to some extent/ No[[68]](#footnote-68).

The questions were asked to a sample of some 60,000 households comprised of 130,000 adults aged 16 or over.

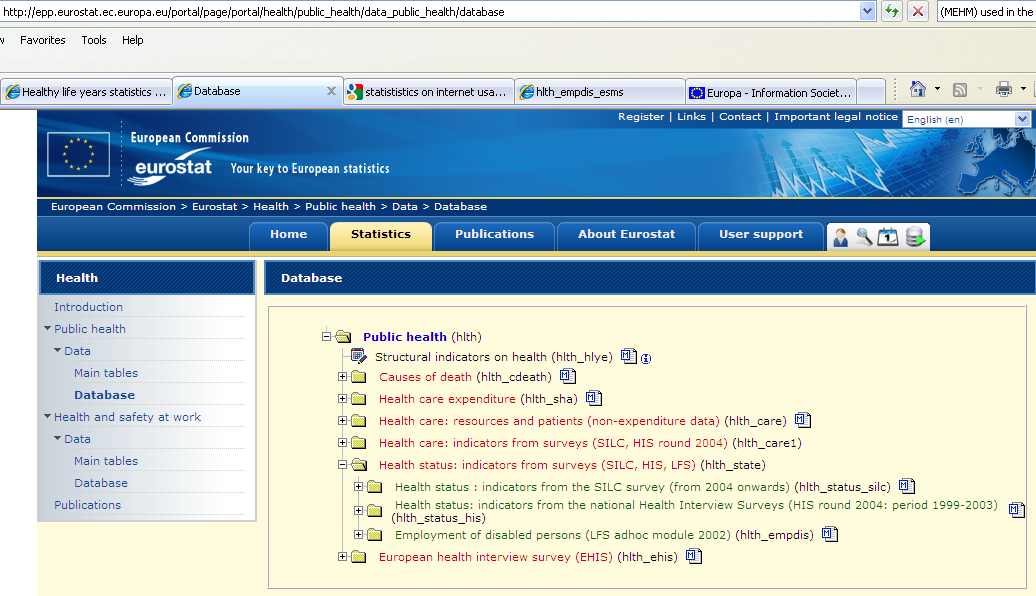
* + 1. LFS 2002 ad hoc module

Then in 2002, in preparation of 2003 European Year of People with Disabilities[[69]](#footnote-69), an ad hoc module on people with disabilities and employment was included in the Labour Force Survey administered by Eurostat with coverage of the population aged 16-64 in EU15 and the 9 of the 12 countries that later accessed the EU (so EU24, missing only Bulgaria; Latvia, and Poland), and including Norway [[70]](#footnote-70). In the 2002 LFS, individuals with disabilities were defined those who reported they had had a longstanding health problem or disability (LSHPD) for 6 months or more or expected to last 6 months or more. The restriction levels were defined differently as compared to the ECHP and were constructed from the combination of three variables and from how respondents reported to feel restricted regarding to them: (1) the kind of work; (2) the amount of work that can be done; and (3) mobility to and from work. Possible replies were “Yes, considerably”, “Yes, to some extent” and “No”. Considerably restricted were classified those who replied “considerably” or “to some extent” to all three questions. To some extent restricted were classified respondents who replied “considerably” or “to some extent” to two of the three questions. Moderate disability applies to those who replied “considerably” or “to some extent” to one of the three questions. Mild disability applies to those who replied “no” to the three questions, but reported having a LSHPD.

* + 1. EU-SILC[[71]](#footnote-71)

The EU Statistics on Income and Living Conditions (EU-SILC), which substituted the ECHP, is the reference source for comparative statistics on income distribution and social inclusion in the European Union (EU). EU-SILC was launched in 2003 on the basis of a gentlemen's agreement between Eurostat and six Member States (Austria, Belgium, Denmark, Greece, Ireland, and Luxembourg) and Norway. It was formally launched in 2004 in fifteen countries and expanded in 2005 to cover all of the then EU-25 Member States, together with Norway and Iceland. Bulgaria launched EU-SILC in 2006 while Romania, Switzerland and Turkey introduced the survey in 2007. So, since 2007 EU-SILC has EU27 coverage, for which the latest available data are for 2009. Self-perceived disabilities statistics come from the Minimum European Health Module (known as MEHM) integrated within the EU-SILC survey and are generated by the following two questions and possible answers (in parenthesis): (1) For at least the past six months, to what extent have you been limited because of a health problem in activities people usually do? (Yes/no); if yes, then (2) Would you say you have been: (strongly limited? / limited? / not limited at all?).Statistics (but not the micro-data[[72]](#footnote-72)) from the LFS 2002 and from EU-SILC are available at the Eurostat website (see screenshot below).

Figure 18: Eurostat website



Source: <http://epp.eurostat.ec.europa.eu/portal/page/portal/microdata/introduction>

Yet, more granular analysis and data can be retrieved from a study developed for DG Employment (Applica 2007) where evidently the authors were given access to the micro-data of both the LFS 2002 and the EU-SILC (but at the time of the study was carried out EU-SILC data were available only for 13 countries and only for 2004). For this reason in developing our projections we have referred mostly to the data presented in this study that, as stated, are richer than those downloadable directly from Eurostat website[[73]](#footnote-73).

* 1. Comparative analysis of the datasets

In order to justify the choice we made in using the above-mentioned datasets it is important to comparatively look at them, for there are some variations that are not irrelevant for our purpose.

The 1996 ECHP reported the following aggregate average value for EU14 (15 minus Sweden):

* Percentage reporting having a chronic physical or mental health problem, illness or disability is 14.5%, of which:
  + Reporting being hampered seriously: (4.5%)
  + Reporting being hampered only to some extent: (10%)

The 2002 ad hoc module of LFS reported, for 24 of what today is EU27 (not including Bulgaria, Latvia, Poland) plus Norway, the re-elaboration of self-reported answers of individuals reporting a Long Standing Health Problem or Disability (LSHPD). It is worth recalling that this survey re-elaborated the raw answers into a scale of disability, as we illustrated earlier. Accordingly the aggregate percentages for the 25 countries considered are:

* Percentage reporting LSHPD is 15.6%, of which:
  + Considerably restricted: (6.3%)
  + To some extent restricted: (4.1%)
  + Reporting LSHPD but no restriction: (5.2%)

The 2004 EU-SILC data analysed in the earlier mentioned study (Applica 2007), covering only 13 countries (BE, DK, EE, IE, EL, ES, FR, IT, LU, AT PT, FI, SE), report aggregate percentages concerning respondents affirming that for at least the six months prior to the interview they experienced limitations to their daily activities due to a generic and no further specified health problem. Please notice that in the question (reported earlier) no reference is made to the health problem being long standing and the term disability is not used. The results for 2004 for the 13 countries considered are:

* Percentage reporting health problem: 21.4%, of which:
  + Very limited: (5.0%)
  + To some extent limited: (10.7%)
  + Not limited at all: (5.7%)

Finally, we can report for all EU27 the EU-SILC results for 2009:

* Percentage reporting health problem is 31.2%, of which:
  + Very limited: (8.1%)
  + To some extent limited: (17.4%)
  + Not limited at all: (5.7%)

It is possible to see how the 1996 ECHP and 2002 LFS data are fairly similar, whereas both the 2004 and 2009 EU SILC ones are substantially different from the former. The inclusion of more or less countries and the difference in the time of measurement can only partially explain such differences. If we start from the reasonable assumption that individuals with disabilities are those suffering from very long standing chronic or other conditions (acquired at birth or as a result of an accident), then it is unlikely that these will change substantially only over the course of 5 to 7 years. If we take the LFS 2002 and the EU-SILC 2009, adding only three more countries after about seven years the raw measure of prevalence appear to have exactly doubled and jumps from 15.6% in 2002 to 31.2% in 2009. This difference, in fact, is mostly explained by the different approach followed in the two surveys as illustrated at length in Applica (2007, chap 1), as we briefly explain below by comparing in more details the LFS ad hoc 2002 module and EU-SILC.

LFS 2002 clearly looks at long-standing health problems and disability and when measuring the degree of restriction it very rigorously combines two dimensions: kind of activity that is restricted (what kind of work activities, amount of work, mobility to and from work) and degree of restriction (yes, considerably, yes to some extent, no). Severely disabled individuals are those who affirmed to be considerably or to some extent restricted in all three kinds of activities, whereas those reporting a LSHPD but classified as “not restricted” answered that they are not hampered in any of the three types of activities. In addition LFS 2002 explored the causes of the restriction and, thus, reports very granular data on different kind of chronic health problems and/or disability (vision, hearing, speech, cognitive, movements, etc., see Applica 2007, chapter 3).

EU-SILC does not mention the long-standing nature of the health problems and neither asks about disabilities, it rather poses a question about a generic health problem and then relates this to also generically defined daily activities. As the question on limitation of daily activities is not specifically linked to a LSHPD, respondents can, therefore, potentially report that they do not have a long-standing illness but nevertheless that they are limited in their activities. To put it differently and in an exemplificative fashion, if a respondent had an accident and broke his/her arm he/she will reply to have been seriously restricted in daily activities in the previous six months, but this restriction will disappear and it would be wrong to place this respondent among the pool of Europeans with disabilities. Finally, there are not specific and granular questions on the EU-SILC on the causes of the restriction and of the kind of health problem.

It is evident, thus, that the sizeable difference in the measure of aggregate prevalence that can be observed between LFS 2002 and EU SILC 2009 is mostly due to the differences in the formulation of the questions, which produces different measurements: of more strictly defined disabilities in LFS 2002 and of more broadly defined health related quality of life in EU-SILC.

A further observation made on the LFS 2002 (Applica 2007, p. 21), but applicable by analogy to EU-SILC, can further illustrate this. Even in the more strict approach of LFS 2002 we observe quite some differences (in all countries) between aggregate prevalence (% reporting LSHPD) and more refined definition of restriction. A correlation coefficient shows that the greater the number reporting having a LSPHD the larger is the proportion of those who, when moving to the next question, answer that they are not restricted although they affirmed that they had a LSHPD. This means that, while even the more specific question of LFS (mentioning long standing nature and disability) leaves space to personal interpretation, being actually restricted is less open to subjective perceptions. This is further corroborated comparing countries: in the LFS 2002 data there is less variation between Member States in the relative number reporting restrictions than in the number reporting an LSHPD. Considering that the first question of EU-SILC is much more generic than that of LFS 2002, then it is clear that the 31.2% aggregate prevalence for EU27 in 2009 (compared to 15.6 for 24 EU countries in 2002) can be mostly attributed to a matter of personal interpretation. Indeed the difference between the general prevalence (31.2%) and the percentage of those strongly limited (8.1%) is substantial (almost four times). In this respect we can notice that for the LFS 2002 the same difference (15.6% versus 6.3%) is not as big but still substantial and that there is less difference between the strongly constrained of LFS 2002 and EU SILC 2009 (6.3% versus 8.1%) than between their aggregate measure of prevalence (15.6% versus 31.2%). There is also a similarity in the proportion of those reporting a problem but then affirming of not being restricted (5.2% in LFS 2002 and 5.7% in EU-SILC). The overall difference, then, is mostly explained by the difference between the ‘to some extent restricted’ (4.1% in LFS 2002 and 17.4% in EU-SILC 2009). Here is worth recalling that in the LFS 2002 those classified as `to some extent restricted’ included individuals who answered “considerably” or “to some extent” to at least two of the three questions on activities (kind of work, amount of work, mobility to and from work). In EU-SILC instead this category includes those affirming to have felt some limitation due to generic health problems: again here there is a much larger space of personal interpretation and of including individuals with problems that are neither long standing nor a full-blown disability.

* 1. Our selection and quantification and the alternative

Having considered all of the above in relation to our purpose and to the potential sensitivity of the our quantitative projections, we were faced with the trade-off between using what we considered the most valid and reliable measurement of the phenomenon at hand or using the most updated data having the widest coverage in terms of countries. The formulation of the trade-off clearly betrays our preference.

We consider the sum of “considerably restricted” and “to some extent restricted” from LFS 2002 (about 10% of total population) as the most valid and reliable measurement, as we are strongly convinced that we should not consider those who declare that they suffer from some type of disability or long-standing health problem but who do not feel in any way restricted by it. The draws back of LFS data are that they: a) date to 2002; b) miss three countries (Bulgaria, Latvia, and Poland, but includes Norway); and c) report prevalence only for the various age group from 16 to 64 (25 to 34 years; 35 to 44 years; 45 to 54 years; 55 to 64 years) but not for the population 65 and older.

EU-SILC 2009, on the other hand, is more updated, covers all Member States (and also Norway that we have included in our analysis), and provides prevalence on the 65 and older group, but as a measurement is a clear overestimation of the phenomenon, unless we uses only the statistics on the considerably restricted (8.1% of total population) that would produce a smaller overall target.

So, we could either apply the 2002 produced parameter of 10% of total population or the 2009 produced parameter of the 8.1% of total population. An additionally important consideration led us to choose the first alternative. In some projections of users’ level benefits we needed information on the type of disability (because not all disabilities are influenced in the same way by Improved Web Accessibility, IWA). Such valuable information is given in the 2002 LFS but not in 2009 EU SILC and, thus, we eventually chose to use the former.

While we reasoned so far in terms of aggregate EU percentages, we must stress that both LFS 2002 and EU-SILC data show wide across-country variability. From LSF special survey, for instance, we get results for the prevalence of disability and long standing health problems in the age 16-64 population that go from the 32% for Finland to the 6% reported for Romania. This is likely to depend both upon country-specific data collection factors but also upon country-specific interpretation of the concept of disability and long standing health problems. Large across-country variation is found also for relative employment rates and relative wages for PwD (versus the labour force at large) also in the LFS 2002. Moreover, as expected, the prevalence varies strongly with age and is much higher for older age groups, for instance in Belgium the considerably restricted are 0,9% of the 16-24 age group but of 7.7% of 55-64 age group. So, in our construction of the potential target we proceeded country by country and age group by age group and only after having produced such absolute numbers we added up and reconstructed ex post the proportion over total population (which includes also the 0 to 15 age group).

So, the starting point of the construction of target and the related projections is the distribution of the prevalence of individuals reporting suffering from long standing health or disability problem (henceforth LSHDP), by degree of restriction and age classes, as captured in the data of the LFS survey (See Table 31). We recall that we use only those considerably restricted or to some extent restricted and do not include those reporting having a LSHPD but affirming not being restricted at all by it.

Table 31: Percentage of individuals reporting LSHDP by restriction, age, countries (Ages 16-24)

|  | **Totally Restricted (16-24)** | **Considerably restricted**  **(16-24)** | **To some extent restricted (16-24)** |
| --- | --- | --- | --- |
| **BE** | 0,028 | 0,009 | 0,019 |
| **CZ** | 0,049 | 0,018 | 0,031 |
| **DK** | 0,062 | 0,017 | 0,045 |
| **DE** | 0,024 | 0,011 | 0,013 |
| **EE** | 0,032 | 0,017 | 0,015 |
| **IE** | 0,025 | 0,015 | 0,01 |
| **EL** | 0,014 | 0,007 | 0,007 |
| **ES** | 0,018 | 0,011 | 0,007 |
| **FR** | 0,054 | 0,054 | 0 |
| **IT** | 0,015 | 0,008 | 0,007 |
| **CY** | 0,026 | 0,011 | 0,015 |
| **LT** | 0,017 | 0,013 | 0,004 |
| **LU** | 0,015 | 0,009 | 0,006 |
| **HU** | 0,013 | 0,011 | 0,002 |
| **MT** | 0,021 | 0,015 | 0,006 |
| **NL** | 0,046 | 0,023 | 0,023 |
| **AT** | 0,022 | 0,008 | 0,014 |
| **PT** | 0,046 | 0,02 | 0,026 |
| **SI** | 0,042 | 0,024 | 0,018 |
| **SK** | 0,015 | 0,01 | 0,005 |
| **FI** | 0,081 | 0,014 | 0,067 |
| **SE** | 0,048 | 0,014 | 0,034 |
| **UK** | 0,071 | 0,039 | 0,032 |
| **RO** | 0,012 | 0,008 | 0,004 |
| **NO** | 0,063 | 0,039 | 0,024 |
| **EU** | **0,036** | **0,018** | **0,018** |

Source: Eurostat LFS data, 2002Table 31 cont.: Percentage of individuals reporting LSHDP by restriction, age, countries (Aged 25-49)

|  | **Totally Restricted**  **(25-49)** | **Considerably restricted**  **(25-49)** | **To some extent restricted**  **(25-49)** |
| --- | --- | --- | --- |
| **BE** | 0,083 | 0,028 | 0,055 |
| **CZ** | 0,116 | 0,046 | 0,07 |
| **DK** | 0,126 | 0,088 | 0,038 |
| **DE** | 0,071 | 0,038 | 0,033 |
| **EE** | 0,091 | 0,043 | 0,048 |
| **IE** | 0,067 | 0,044 | 0,023 |
| **EL** | 0,044 | 0,019 | 0,025 |
| **ES** | 0,054 | 0,037 | 0,017 |
| **FR** | 0,126 | 0,126 | 0 |
| **IT** | 0,04 | 0,022 | 0,018 |
| **CY** | 0,077 | 0,032 | 0,045 |
| **LT** | 0,065 | 0,046 | 0,019 |
| **LU** | 0,042 | 0,021 | 0,021 |
| **HU** | 0,103 | 0,094 | 0,009 |
| **MT** | 0,054 | 0,033 | 0,021 |
| **NL** | 0,127 | 0,076 | 0,051 |
| **AT** | 0,062 | 0,022 | 0,04 |
| **PT** | 0,13 | 0,061 | 0,069 |
| **SI** | 0,156 | 0,094 | 0,062 |
| **SK** | 0,073 | 0,041 | 0,032 |
| **FI** | 0,174 | 0,066 | 0,108 |
| **SE** | 0,101 | 0,049 | 0,052 |
| **UK** | 0,136 | 0,093 | 0,043 |
| **RO** | 0,043 | 0,02 | 0,023 |
| **NO** | 0,113 | 0,098 | 0,015 |
| **EU** | **0,09** | **0,052** | **0,038** |

Source: Eurostat LFS data, 2002 Table 31 cont.: Percentage of individuals reporting LSHDP by restriction, age, countries (Ages 50-65)

|  | **Totally Restricted (50-65)** | **Considerably restricted (50-65)** | **To some extent restricted (50-65)** |
| --- | --- | --- | --- |
| **BE** | 0,116 | 0,039 | 0,077 |
| **CZ** | 0,301 | 0,11 | 0,191 |
| **DK** | 0,232 | 0,172 | 0,06 |
| **DE** | 0,202 | 0,125 | 0,077 |
| **EE** | 0,241 | 0,128 | 0,113 |
| **IE** | 0,176 | 0,122 | 0,054 |
| **EL** | 0,133 | 0,053 | 0,08 |
| **ES** | 0,177 | 0,133 | 0,044 |
| **FR** | 0,263 | 0,263 | 0 |
| **IT** | 0,116 | 0,069 | 0,047 |
| **CY** | 0,241 | 0,095 | 0,146 |
| **LT** | 0,195 | 0,132 | 0,063 |
| **LU** | 0,09 | 0,053 | 0,037 |
| **HU** | 0,248 | 0,225 | 0,023 |
| **MT** | 0,141 | 0,083 | 0,058 |
| **NL** | 0,225 | 0,17 | 0,055 |
| **AT** | 0,177 | 0,068 | 0,109 |
| **PT** | 0,368 | 0,199 | 0,169 |
| **SI** | 0,372 | 0,245 | 0,127 |
| **SK** | 0,181 | 0,102 | 0,079 |
| **FI** | 0,42 | 0,235 | 0,185 |
| **SE** | 0,143 | 0,081 | 0,062 |
| **UK** | 0,274 | 0,215 | 0,059 |
| **RO** | 0,115 | 0,05 | 0,065 |
| **NO** | 0,268 | 0,25 | 0,018 |
| **EU** | **0,211** | **0,137** | **0,074** |

Source : Eurostat LFS data, 2002

Note that using LFS 2002 we are covering 24 of what are today EU27 (missing Bulgaria, Latvia, and Poland) plus Norway. Then, we have applied the percentages from the previous table (coming from LFS 2002) to the population of the 24 EU countries plus Norway in 2006. The selection of 2006 is not arbitrary but is explained by one clear requirement of our projection exercise. Making the reasonable (from an epidemiological and clinical perspective) assumption that in less 8 years only minor changes in prevalence of LSHPD can occur (not to the extent of changing the order of magnitude percentage shares in significant ways), we could have applied the 2002 parameters to the 2010 population statistics. Yet, one of the key benefits of IWA we aimed to project was that of a potential increased productivity of workers with disabilities to be reflected in higher wages, for which we needed a common baseline year statistic. The latest EU27 source available on wages is the 2006 edition of the Eurostat Structure of Earnings Survey and, thus, we used the same baseline year for population statistics. So, using the 2002 parameters and applying them to the 2006 population statistics we generated the estimated number of individuals being restricted (considerably and/or to some extent) by a disability or a long-standing health problem by different age groups, and country-by-country that are presented in Table 32[[74]](#footnote-74). Finally, before presenting the total target used in Table 32 and providing also the alternative target we decided not to use, we need to briefly discuss a general issue. While the most direct and intuitive target of IWA are PwD, it is also well known that potential beneficiaries from web accessibility are not only people with strictly defined disabilities, but also the elderly people in good health but with less digital skills, individuals of different background who are still digitally excluded, as well as those dealing with situational constraints, temporal limitations on their functionalities (e.g. mobility constraints after an sport accident), or anyone who needs or prefers to access the information in an alternative way[[75]](#footnote-75). Web accessibility amounts to making content and services simple and more users friendly, which can be interpreted as lowering access or usage barriers. From the perspective of those who are less used and capable of using the Internet Web Accessibility lower the access (instrumentation) and skills requirements and, indeed, in our theoretical reasoning we made the analogy that IWA can be seen as functionally equivalent to increasing digital skills of all the individuals concerned (on this basis we applied the literature on digital skills and labour market outcomes, see Section 7). Additionally, IWA benefits anyone making access easier independently from the device used and/or the situational constraints. So, we are aware that the potential pool of beneficiaries is large than individuals identified as being restricted considerably or to some extent as a result of a LSHPD. Yet, in our projections we mostly focus on them for a number of reasons. First, throughout our Technical Offer and subsequent reports, we have always stated that we would estimate users level benefits from IWA only for “people with disabilities and older people with functional impairments”. By taking individuals considerably and to some extent restricted we exactly capture this target, and the majorities of those reporting to be restricted to some extent in LFS 2002 are precisely the elderly with some functional impairment. Yet, it is not simply a matter of what we offered to do and, indeed, what we offered to do was shaped by a two other considerations worth repeating here. Second, we lack the granular data that would enable us to include other targets alongside PWD without double counting. Eurostat statistics on access and usage of the Internet do not enable us to know how many of the 30% of Europeans still excluded digitally are also PWD. If we had this data we could then add to our target only the digitally excluded that are not PWD and then we could have a different potential target of those benefitting from IWA without double-counting. As we show later, we could disentangle from the overall number of European aged 65 and older those being considerably or to some extent restricted by a LSHPD and those not being restricted. Yet, we have no way to recover how many of the latter are digitally excluded (Eurostat statistics on Internet usage are for the entire group). Third, the situation of PWD of working age (16-64) in terms of disadvantages (in access to education and work and in income level) is very peculiar and dire and projecting benefits for them is absolutely not comparable to doing the same thing for other groups: the potential benefits are larger and the kind of data needed are very different (therefore would have been beyond the scope and resources of this study to go beyond our originally defined target). With respect to the latter two considerations we take this occasion to strongly stress that much remain to be done in terms of availability of data if we really want to make progress in understanding and quantifying the costs and benefits of Web Accessibility. At EU27 level we have no statistics whatsoever on access to, and usage of, the Internet by PWD. All we have is a sentence but no table or graph contained in a 2002 edition of Eurobarometer (Eurobarometer 2002: p 9) telling us that access to the Internet by PWD was 25% compared to 43% of the general population at that time (2002). Moreover, there is no free access to the micro-data of surveys such as LFS 2002, EU-SILC, and others useful for socio-economic analysis and researcher have to stick to the data and aggregation decided top-down by Eurostat experts.

Table 32: Individuals restricted by a LSPHD by country and age groups (2006 estimates, Ages 16+)

| **Country** | **Target [(2)+(3)] (1)**  **Total (16 +)** | **Considerably (2)**  **Total (16 +)** | **To some extent (3)**  **Total (16 +)** | **Unrestricted T. Pop - (1)**  **Total (16 +)** | **Target [(2)+(3)] (1)**  **Total (16 +)** |
| --- | --- | --- | --- | --- | --- |
| **BE** | 722.972,85 | 242.897,02 | 480.075,84 | 7.538.973,40 | 156.073,00 |
| **CZ** | 1.495.560,67 | 560.323,98 | 935.236,69 | 6.930.826,27 | 342.498,80 |
| **DK** | 668.065,93 | 467.369,35 | 200.696,58 | 3.527.359,88 | 139.767,92 |
| **DE** | 7.898.466,74 | 4.671.596,30 | 3.226.870,44 | 59.288.499,19 | 2.464.566,30 |
| **EE** | 150.931,37 | 77.675,67 | 73.255,69 | 947.675,46 | 43.749,29 |
| **IE** | 299.640,06 | 202.327,54 | 97.312,52 | 2.937.095,55 | 62.226,14 |
| **EL** | 683.631,12 | 280.454,64 | 403.176,49 | 8.450.140,83 | 220.467,67 |
| **ES** | 3.286.725,92 | 2.393.313,73 | 893.412,19 | 32.244.973,08 | 952.660,86 |
| **FR** | 8.060.630,01 | 8.060.630,01 | 0,00 | 40.385.426,43 | 1.921.966,57 |
| **IT** | 3.214.247,36 | 1.866.835,62 | 1.347.411,74 | 44.198.383,42 | 995.018,98 |
| **CY** | 73.066,08 | 29.361,32 | 43.704,76 | 531.634,57 | 17.362,34 |
| **LT** | 280.675,64 | 193.245,27 | 87.430,37 | 2.462.371,27 | 82.291,41 |
| **LU** | 20.168,82 | 11.206,93 | 8.961,89 | 347.125,52 | 4.559,52 |
| **HU** | 1.198.135,71 | 1.087.978,53 | 110.157,18 | 6.973.971,48 | 307.376,03 |
| **MT** | 26.429,07 | 15.880,29 | 10.548,79 | 296.765,72 | 6.167,43 |
| **NL** | 1.938.870,73 | 1.322.907,67 | 615.963,06 | 10.834.481,49 | 393.246,11 |
| **AT** | 649.192,28 | 243.287,18 | 405.905,10 | 5.929.483,22 | 176.782,30 |
| **PT** | 1.773.725,51 | 916.214,51 | 857.511,00 | 6.724.226,46 | 513.428,50 |
| **SI** | 365.280,28 | 232.958,48 | 132.321,80 | 1.291.496,79 | 92.410,90 |
| **SK** | 426.693,72 | 241.499,93 | 185.193,78 | 3.938.542,08 | 90.716,07 |
| **FI** | 1.087.447,82 | 533.162,82 | 554.285,00 | 3.053.949,22 | 264.881,23 |
| **SE** | 767.005,08 | 394.925,33 | 372.079,75 | 6.226.907,22 | 153.965,60 |
| **UK** | 8.324.486,70 | 6.107.080,25 | 2.217.406,45 | 38.674.429,50 | 1.920.068,83 |
| **RO** | 1.121.332,34 | 507.105,26 | 614.227,08 | 16.577.432,10 | 305.676,46 |
| **NO** | 572.751,51 | 510.804,59 | 61.946,92 | 2.949.174,71 | 125.601,45 |
| **EU+NO** | 45.106.133,32 | 31.171.042,21 | 13.935.091,11 | 313.261.344,85 | 11.753.529,70 |

Source: LFS 2002 and Eurostat 2006 population dataTable 32 cont.: Individuals restricted by a LSPHD by country and age groups (2006 estimates, Ages 16+)

| **Country** | **Considerably (2)**  **Only 65 +** | **To some extent (3)**  **Only 65 +** | **Unrestricted T. group - (1)**  **Only 65 +** |
| --- | --- | --- | --- |
| **BE** | 52.472,82 | 103.600,18 | 1.652.944,00 |
| **CZ** | 125.165,67 | 217.333,13 | 1.113.892,20 |
| **DK** | 103.621,05 | 36.146,88 | 683.259,08 |
| **DE** | 1.525.102,91 | 939.463,39 | 13.405.507,70 |
| **EE** | 23.236,14 | 20.513,15 | 181.572,71 |
| **IE** | 43.134,03 | 19.092,11 | 399.266,86 |
| **EL** | 87.855,54 | 132.612,13 | 1.840.116,33 |
| **ES** | 715.841,21 | 236.819,65 | 6.355.794,14 |
| **FR** | 1.921.966,57 | 0,00 | 8.419.391,43 |
| **IT** | 591.864,74 | 403.154,24 | 10.597.316,02 |
| **CY** | 6.844,08 | 10.518,27 | 74.979,66 |
| **LT** | 55.704,95 | 26.586,45 | 439.520,59 |
| **LU** | 2.685,05 | 1.874,47 | 61.440,48 |
| **HU** | 278.869,38 | 28.506,65 | 1.283.335,97 |
| **MT** | 3.630,47 | 2.536,96 | 49.266,57 |
| **NL** | 297.119,28 | 96.126,83 | 1.937.212,89 |
| **AT** | 67.916,36 | 108.865,94 | 1.180.804,70 |
| **PT** | 277.642,04 | 235.786,46 | 1.296.671,50 |
| **SI** | 60.862,02 | 31.548,88 | 220.463,10 |
| **SK** | 51.121,76 | 39.594,31 | 541.921,93 |
| **FI** | 148.207,36 | 116.673,88 | 576.283,77 |
| **SE** | 87.211,28 | 66.754,31 | 1.411.411,40 |
| **UK** | 1.506.623,35 | 413.445,48 | 7.744.347,17 |
| **RO** | 132.902,81 | 172.773,65 | 2.892.483,54 |
| **NO** | 117.165,53 | 8.435,92 | 556.867,55 |
| **EU+NO** | 8.284.766,40 | 3.468.763,30 | 64.916.071,30 |

Source: LFS 2002 and Eurostat 2006 population data

So, the table above tells us that, following our choices (application of LFS 2002 parameters to 2006 EU population data, not including Bulgaria, Latvia, and Poland, but including Norway), we can estimate that in 2006 there were 45.1 million Europeans (about 10% of the total population of reference: Norway plus 24 EU countries, excluding Bulgaria, Latvia, and Poland) who were either considerably or to some extent restricted by a LSHPD and that represent the target of those that could potentially benefit from IWA and that we have used to produce our projections. Of this 45.1 million about 11.7 million are in the age group 65 and above, and the remaining 33.4 million in the age group 16-64. There are about another 64.9 million individuals aged 65 and above that did not report having a LSHPD and that so can be considered unrestricted. Yet, they could also benefit for IWA in terms of easier access and use. So, although for the reasons explained earlier we will produce our projections starting only from the 45.1 million, we can conclude that the potential total target of beneficiaries could defined as including the individual with disabilities (45.1 million) strictly defined and all those aged 65 and above that are not disabled (64.9 million) for a total of 110 million individuals.

As anticipated, for reasons of transparency and for allowing other researchers interested in this topic to make their own choice, the table below included the data we constructed using EU-SILC for EU27 plus Norway in 2009, from which a much larger potential target can be quantified.

In the table below we used data from EU-SILC 2009 and applied them to Eurostat statistics on the 2010 population by age groups. By doing so one can come up with a total pool of PwD equal to 106.7 million and with a total of PwD plus elderly not affected by LSHPD (39 million) of 145.7 million. It is probably pleonastic but we repeat our view that this is a large over-estimation of the numbers of strictly defined PwD and is rather a measure of broadly and generically defined health related quality of life. We leave it up to the reader to judge, but reiterate that we did not use the data of table above for the quantitative projections of user level benefits.

Table 33: Individuals restricted by a generic health problem by country and age groups (2010 estimates)

| **Country** | **Considerably (1)**  **15-64** | **To some extent (2) 15-64** | **Total (3a) [(1)+(2)] 15-64** |
| --- | --- | --- | --- |
| **Belgium** | 359.509,14 | 835.895,15 | 1.195.404,29 |
| **Bulgaria** | 103.328,99 | 424.569,61 | 527.898,60 |
| **Czech Rep.** | 270.409,08 | 878.373,19 | 1.148.782,26 |
| **Denmark** | 221.242,22 | 552.271,27 | 773.513,49 |
| **Germany** | 3.754.378,84 | 8.910.433,16 | 12.664.811,99 |
| **Estonia** | 35.649,26 | 135.566,92 | 171.216,18 |
| **Ireland** | 127.177,57 | 310.683,85 | 437.861,41 |
| **Greece** | 368.674,77 | 902.186,78 | 1.270.861,55 |
| **Spain** | 1.013.722,32 | 4.092.656,15 | 5.106.378,47 |
| **France** | 1.928.212,23 | 4.444.324,26 | 6.372.536,49 |
| **Italy** | 1.358.695,39 | 4.432.026,72 | 5.790.722,11 |
| **Cyprus** | 21.579,42 | 42.893,05 | 64.472,47 |
| **Latvia** | 56.283,24 | 279.786,22 | 336.069,45 |
| **Lithuania** | 87.777,90 | 217.901,05 | 305.678,94 |
| **Luxembourg** | 13.536,53 | 35.212,33 | 48.748,85 |
| **Hungary** | 318.346,13 | 1.011.386,83 | 1.329.732,95 |
| **Malta** | 5.704,69 | 15.616,40 | 21.321,10 |
| **Netherlands** | 409.402,07 | 1.902.839,19 | 2.312.241,27 |
| **Austria** | 343.436,01 | 782.549,83 | 1.125.985,84 |
| **Poland** | 1.196.274,86 | 3.345.398,32 | 4.541.673,18 |
| **Portugal** | 451.800,61 | 1.102.009,87 | 1.553.810,49 |
| **Romania** | 543.576,65 | 1.451.378,66 | 1.994.955,31 |
| **Slovenia** | 105.385,75 | 194.369,90 | 299.755,65 |
| **Slovakia** | 240.687,96 | 700.315,45 | 941.003,41 |
| **Finland** | 162.261,47 | 685.585,89 | 847.847,36 |
| **Sweden** | 248.690,67 | 418.002,18 | 666.692,85 |
| **United Kingdom** | 2.231.371,84 | 3.332.130,31 | 5.563.502,15 |
| **Norway** | 127.985,28 | 298.026,40 | 426.011,67 |
| **EU27 + NO** | 16.105.100,88 | 41.734.388,93 | 57.839.489,80 |

Source: EU-SILC 2009 and Eurostat 2010 population dataTable 33 cont.: Individuals restricted by a generic health problem by country and age groups (2010 estimates)

| **Country** | **Considerably (1) 65 AND ABOVE** | **To some extent (2) 65 AND ABOVE** | **Total (3b) [(1)+(2)] 65 AND ABOVE** | **Overall Total (3a)+ (3b)** |
| --- | --- | --- | --- | --- |
| **Belgium** | 306.196,60 | 552.947,96 | 859.144,56 | 2.054.548,85 |
| **Bulgaria** | 185.632,93 | 383.837,00 | 569.469,93 | 1.097.368,53 |
| **Czech Rep.** | 253.587,32 | 550.972,67 | 804.559,99 | 1.953.342,25 |
| **Denmark** | 105.141,75 | 209.255,23 | 314.396,98 | 1.087.910,46 |
| **Germany** | 3.992.867,67 | 6.758.971,93 | 10.751.839,59 | 23.416.651,59 |
| **Estonia** | 53.775,26 | 100.809,46 | 154.584,72 | 325.800,90 |
| **Ireland** | 67.681,58 | 155.644,99 | 223.326,57 | 661.187,98 |
| **Greece** | 628.882,73 | 714.302,41 | 1.343.185,14 | 2.614.046,69 |
| **Spain** | 1.247.798,70 | 3.080.613,68 | 4.328.412,38 | 9.434.790,85 |
| **France** | 2.691.450,12 | 3.291.069,70 | 5.982.519,83 | 12.355.056,31 |
| **Italy** | 2.677.296,23 | 4.961.663,33 | 7.638.959,56 | 13.429.681,67 |
| **Cyprus** | 22.427,62 | 29.603,90 | 52.031,52 | 116.503,99 |
| **Latvia** | 73.359,14 | 187.036,33 | 260.395,47 | 596.464,93 |
| **Lithuania** | 109.832,44 | 212.425,51 | 322.257,95 | 627.936,89 |
| **Luxembourg** | 10.279,33 | 19.547,68 | 29.827,01 | 78.575,86 |
| **Hungary** | 402.970,68 | 677.014,73 | 1.079.985,41 | 2.409.718,36 |
| **Malta** | 8.100,49 | 15.344,68 | 23.445,17 | 44.766,26 |
| **Netherlands** | 295.658,83 | 904.180,74 | 1.199.839,56 | 3.512.080,83 |
| **Austria** | 362.932,67 | 469.779,93 | 832.712,60 | 1.958.698,44 |
| **Poland** | 1.166.406,23 | 1.821.276,92 | 2.987.683,15 | 7.529.356,34 |
| **Portugal** | 550.742,36 | 733.039,37 | 1.283.781,73 | 2.837.592,21 |
| **Romania** | 672.895,02 | 1.085.923,78 | 1.758.818,80 | 3.753.774,11 |
| **Slovenia** | 80.889,72 | 80.013,36 | 160.903,08 | 460.658,74 |
| **Slovakia** | 245.635,09 | 288.589,09 | 534.224,18 | 1.475.227,59 |
| **Finland** | 176.002,91 | 316.724,13 | 492.727,04 | 1.340.574,40 |
| **Sweden** | 206.582,15 | 263.688,68 | 470.270,82 | 1.136.963,67 |
| **United Kingdom** | 2.057.900,30 | 2.132.364,80 | 4.190.265,09 | 9.753.767,25 |
| **Norway** | 85.202,69 | 123.223,65 | 208.426,35 | 634.438,02 |
| **EU27 + NO** | 18.738.128,57 | 30.119.865,60 | 48.857.994,17 | 106.697.483,98 |

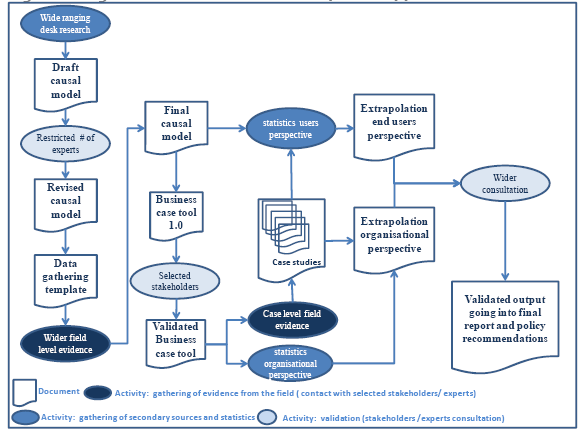
Source: EU-SILC 2009 and Eurostat 2010 population data

Annex 2: Methodological Approach, Design and Sources

* 1. Overall approach

The figure below provides a detailed snapshot of the overall research design upon which this study was built. This snapshot combines both the methodological principles and management definition of tasks in one single picture

Figure 19: Study Overall design



Source: Study Consortium’s elaboration

We approached the analysis and quantification of eAccessibility costs and benefits as an issue of public policy evaluation and measurement and used the relevant theoretical and methodological insights[[76]](#footnote-76). Evaluation is a matter of linking a cause to an effect and assigning to such relation a value (possibly monetary, or at least quantitative, which is the measurement side of evaluation). Evaluation, and the corresponding measurement, must, thus, rest upon a theory of causality and a corresponding causal modelling of the relations existing among the key variables in a given field.

Accordingly, we have designed our study following the key steps typical of public policy impact evaluation that are reported in Table 34.

Please note that so far we have used below the term ‘impact’ as a generic umbrella term. In practice in the literature on impact evaluation there is a distinction between outcomes and impacts, to which we return later (§2.4).

Table 34: Steps in evaluation studies design

| **Steps** | **Illustration** |
| --- | --- |
| Causal Model and Hypotheses | Use science, theory, and consolidated evidence from secondary sources (but also, if there is lack of them, common sense and imagination) to:   * Build a causal model of impacts depicting how all the variables of interest are related * Operationalise the causal relations into measurable/testable hypothesis about impacts in terms of benefits and costs |
| Method selection | Compare the model and hypotheses formulated with the data available and/or feasible to be constructed and:   * Select a set of impacts that seem feasible for organisations to measure * Select a method to test and quantify the main impacts identified |
| Empirical evidence | Gather the empirical evidence needed to test/quantify the selected impacts |
| Analysis | * Derive from hypotheses and empirical evidence a micro level impact measurement methodology (Business Case Tool) * Use theory and evidence to quantify impacts using the selected method (Quantitative Projections) |
| Concluding | Conclude by making judgements and recommendation on the basis of the results of the previous step |

Source: Study Consortium’s elaboration

First, we started by formulating a causal model of what can happen in terms of broadly defined impacts (including areas of users level benefits and of organisational level benefits and costs) under the assumption of increase in the level of adoption of eAccessibility (Causal Model). From the more general and high-level hypotheses of the causal model we extracted operationalised and measurable hypotheses in the form of Key Aspects. Second, with the main causal hypotheses in mind, we looked at the availability of data to identify those key aspects that are more feasible to be measured and then selected the appropriate method for micro level and macro level measurement. Third, the empirical evidence from secondary sources (wide ranging desk research) was reinforced with additional evidence we constructed though field-work (Field Level Evidence, FLE, and Case Studies). This additional evidence was used both to corroborate steps 1 and 2 and to produce empirical parameters and test for step 4. Step 4 comprises the more analytical part of our work where all the previous input were processed to produce two related but different output:

1. a micro level measurement tool (BCT Micro) intended to support organisations to build their business case when deciding their investments in eAccessibility;
2. aggregate EU27 quantitative projections in monetary values of 7 key aspects (including users level benefits, organisational level benefits, and organisational level costs, based on assumptions and calculations made using the BCT Macro).

The BCTs (both Micro and Macro versions) are informed by the causal model and key aspects and has been designed also in relation to testing in the case studies. In the same way the quantitative projections are constructed for a few key aspects using some of the hypotheses of the causal model, secondary sources evidence and statistics, and insights from the FLE and case studies. So, the BCTs and quantitative projections share common element but it is important to repeat that they are different. One is a micro level tool that organisation may use in the future to build their eAccessibility business case, the other is a macro level projection of potential benefits and costs under several 'what if' assumptions and scenarios. Therefore, the reader can find commonalities but should not expect a one to one matching between BCTs and quantitative projections. The final step consisted in interpreting the previous finding treating eAccessibility as a form of innovation and applying key insights from innovation theory and economics of innovation in order to formulate policy recommendations. While we have provided so far a brief illustration of the overall methodological approach, in the following paragraphs we present some additional details on the choices more specifically related to each different group of tasks and related output.

* 1. Causal model and key aspects

The causal model was generated on the basis of hypotheses supported in the large body of sources gathered as part of the desk research (see more on the sources in §0 of Annex 4.1). Out of hundreds of initially identified sources we only selected about 190 for in depth analysis following these criteria:

* The source discusses the potential users level benefits from increased accessibility in one of the three domain of interests (Web, Digital TV, Self-Service Terminals) and provides some form of evidence (theory plus systematic empirical evidence; theory supported by examples and anecdotal evidence; theory only; only practical anecdotal evidence) on such benefits;

And/or

* The source discusses the potential organisational level costs and benefits from increased accessibility in one of the three domain of interests (Web, Digital TV, Self-Service Terminals) and provides some form of evidence (theory plus systematic empirical evidence; theory supported by examples and anecdotal evidence; theory only; only practical anecdotal evidence) on such costs and benefits;

And/or

* Although not touching at all on the topic of eAccessibility costs and benefits, the source provides various statistics concerning PwD (socio-economic situation, usage of the Internet).

And/or

* Although not touching at all on the topic of eAccessibility costs and benefits, the source uses scientific and systematic empirical evidence to discuss in general the conditions of PwD and identify how human made barriers constrain their lives and cause societal costs. Such sources were of strategic importance for the literature on the societal costs of disabilities is much more consolidated and have a much longer history than that on eAccessibility and these sources were used to identify some areas of potential impacts that can be used by analogy for the field of eAccessibility;

And/or

* Although not touching at all on the topic of eAccessibility costs and benefits, the source contains a scientific and formally quantified economic analysis of the impact of using ICT and having ICT skills on a number of desirable outcomes (i.e. labour market outcomes. These sources are fundamental to recover hypotheses about causal relations and apply them to the field of eAccessibility by analogy given that formally tested quantitative economic analysis of the impact of eAccessibility do not exist at all.

The sources were also categorised into three groups as reported below in a hierarchical order of reliability:

* **Scientific sources**: articles in peer reviewed journals and academic books;
* **Institutional sources**: reports commissioned by international, and/or national, and/or regional/local public institutions, official statistics;
* **Practitioners produced sources**: reports, cases studies, Web contents produced/commissioned by NGOs, foundations, or other players working in support of the disabled rights, and/or by industry players.

Using the kind of sources available in combination with their classification we constructed the causal model of impacts including the causal relations for which it was possible to find most support in the most reliable sources. In this respect we assumed scientific sources to be more neutral than institutional reports and sources produced by practitioners. In one way or another the latter have a political agenda and in some case stretch the evidence they gathered (very often only anecdotal) as to support their claims on what is needed (i.e. advocates for PwD overestimate users and organisations’ benefits, whereas industry tends to over-emphasise the complexity and costs of introducing eAccessibility). So, as much as was possible, we selected those causal relations for whom scientific support was available directly or by analogy. Some considerations on the limits of evidence available from secondary sources are in order here. The aim of the desk research was two-fold: a) primarily to extract the evidence to build the causal model; b) but also to start gathering quantified evidence on costs and benefits, relevant statistics, and extract information on the organisational level of analysis that could guide the field level evidence and case studies. The findings of the wide ranging desk research shows that: a) the body of literature on eAccessibility costs and benefits is still far from being consolidated; and b) at EU27 there is still a lack of statistics on relevant parameters. First, while the more general literature on eAccessibility (mostly technical and regulatory) is growing, the contributions strictly focusing on costs and benefits are very limited (sources of type 1 and type 2 in the previous list). In building the casual model and extracting the key aspects we had to bridge such limited literature with contiguous fields (sources of type 4 and type 5 in the previous list) and develop some hypotheses by analogy. Second, a corollary of the above, scientific sources on this topic lag behind in number compared to institutional reports and practitioners generated contents. This is natural inasmuch as it is well known that the cycle from initial research to publication (going through peer review) in the scientific field is 5 to 6 times longer than that of institutional reports and of practitioners’ sources. Third, in comparative terms the sources on users level benefits are more numerous and of higher quality than those on organisational level costs and benefits. Indeed in this respect it is worth quoting what stated in one recent article on the topic: “The issue of Web Accessibility has gained little attention in the area of economics and business so far even though its implementation especially in organisations of the private sector justifies also business and management research to be considered” (Leitner & Strauss 2008, p. 490) and again later: “An extensive literature research in the field of Web Accessibility revealed various technical studies about Website accessibility evaluation but very few studies on business and managerial benefits of Web Accessibility” (Ibid, p. 493)[[77]](#footnote-77). In particular on the organisational costs of eAccessibility there are practically no reliable scientific sources and one can find controversial claims (costs being very small or very high) in institutional reports and practitioners’ generated content. In this respect our field-work enabled us to start filling this gap on costs. Fourth, whereas solid EU level datasets are available on the socio-economic situations of PwD (see Annex 1.1) they cannot be matched with EU27 statistics on PwD level of digital inclusion, usage of the Internet for different purposes, etc. As anticipated already in §3.1, all we know at EU aggregate level about PwD and the Internet is only the general percentage of those accessing the Internet in 2002 from a Eurobarometer survey. Fifth, the limited evidence found through the desk research especially for organisations constraints the following gathering of field level evidence and case studies in that we had to identify and select the sample of organisations to be surveyed and interviewed from scratch.

* 1. Field level evidence and case studies

FLE and case studies activities were undertaken to obtain evidence directly from the field and precisely from organisations, that is to say the kind of evidence that was not possible to obtain from the desk research on benefits, costs, as well as on other issues. Field level evidence and case studies focussed only on organisations both to gain a better understanding on the issue of eAccessibility costs and benefits and on other dimension in general, and to more specifically: a) extract from empirical evidence quantitative parameters to be used in the aggregate quantitative projections of organisational level costs and benefits; b) use a few case studies as test beds for the BCT. We recall that these tasks concerned only Web Accessibility.

The overall view on the kind of information gathered can be obtained by looking at the questionnaires used for the FLE and the case studies (available at <http://www.eaccessibility-impacts.eu/>). In a way these field-work activities aimed at recovering facts and also tacit knowledge directly from the individuals involved with issues of Web Accessibility in their organisation. As such, it is important to stress that neither the FLE nor the case studies raised any claim on producing evidence statistically representative of the universe of organisations in EU27. It goes without saying that within the time and resource constraints of this study it was not possible to carry out such representative sample survey. Nonetheless the organisations surveyed and interviewed were selected following a conceptual and theoretically sound design (especially for case studies see § 4.3 of Annex 4.1) as to ensure qualitative representation of different sectors, organisational sizes, and of similar country clusters.

In order to collect information during the FLE task, two questionnaires were prepared and distributed to relevant respondents between July and August 2010. The first questionnaire was circulated to organisations and companies and it investigated, among other things, the benefits of Web Accessibility for organisations and the costs related to the development and maintenance of accessible web sites. It was an attempt to first assess the level of awareness about costs and benefits within organisation, to verify to what extent organisations measure such costs and benefits, and possibly obtain empirical data on them from those organisations that had a measurement in place. In addition we also asked the respondents about their overall level of satisfaction after introducing Web Accessibility, whether they found it complex and difficult, what problems they have encountered, when they decide to make their website accessible and what the main driver behind such decisions was. Forty-three responses were received from organisations representative of different sizes, sectors and Member States. The second questionnaire was distributed only to web consultancy firms across Europe to further investigate the fee they charge and in general the costs of designing an accessible website in absolute terms and relatively to developing a non-accessible one (so to recover what can be the additional cost of Web Accessibility as compared to the costs each organisation would bear anyway given the assumption that today every organisation has a website).

A total of 24 case studies investigated most of the same topics of FLE but in a deeper fashion: the questionnaire was filled in through in depth interviews (face-to-face or by telephone), whereas that of FLE was distributed and returned by e-mail. A few of the case studies were used also as test beds for the BCT. The design of the case studies was highly sophisticated as to ensure that despite the qualitative nature of the sampling some of the finding could be generalised and used as parameters in the quantitative projections. This design is illustrated in full in § 4.3 of Annex 4.1.

Let us now first illustrate two problems encountered in conducting this field-work, and then stress the important contribution that FLE and case studies nonetheless make to our understanding of our topic of interest.

First, as anticipated, the limited evidence from the wide-ranging desk research did not provide with any input as to examples and cases in different countries with different degrees of adoption and success in introducing Web Accessibility, from which we could have started to construct our sample of organisations for both the FLE and the case studies. This was very time consuming and required extra work to construct the sample before starting the data gathering. Second, as it turned out, very few organisations provided us with reliable quantitative figures on the benefits they achieved and the cost they incurred after introducing an accessible website. Combining the questionnaire to the web consultancies firms and the case studies we were able to recover quantitative parameters for the costs.

Moving to the contributions we can stress at least three points. First, the little awareness and measurement practice for tangible costs and benefits of Web accessibility is an important empirical finding per se that we use to draw some of our policy recommendations. Second, the empirical evidence gathered enriches our analysis in general and, particularly, for the organisational costs of Web Accessibility enable us to fill a gap and to produce quantitative projections that, unlike earlier attempts (European Commission 2007b; Cullen et al 2008) are grounded into evidence from empirical field work. Third, additional evidence not strictly related to costs and benefits but concerning problems encountered and overall satisfaction after introducing Web Accessibility is also an important insight for the final policy recommendations.

* 1. Quantitative projections

The issue of assessing and quantifying the costs and benefits of Web Accessibility at the macro EU27 aggregate level falls in the domain of impact evaluation. Although impact evaluation is carried out both in qualitative and quantitative fashion, the request of the Commission was for a quantitative assessment in monetary term. So, our literature of reference is that of quantitative evaluation conducted using formal quantitative techniques by statisticians and/or econometricians. Let us then start this paragraph with a short general premise on the key concepts and methods used in the domain of formalised and quantitative ex post or ex ante impact evaluation in order to illustrate the approach we followed and its clear limitations.

In the domain of impact evaluation there is a clear distinction between outcomes and impacts, where the latter are used only to refer to the very ultimate and macro level effect for economy and society as a whole (one could use also the expression end outcomes), whereas effects on well-defined constituencies are called outcomes (that could be further distinguished into direct and intermediate). Moreover, the policy object of evaluation is generally referred to as the ‘treatment’. The actual treatment is the combined results of the input invested into the policy and of the output resulting from the implementation process. Formal quantitative ex post impact evaluation is conducted using either an experimental (randomised control trials) or an observational approach (i.e. propensity score matching, regression discontinuity design, double difference, instrumental variables). Formal quantitative ex ante evaluation applies the parameters from past ex post evaluation and input them into a system of structural equations or into micro and/or macro modelling techniques based on computational simulation. In both cases the analysis looks at three broad sets of variables:

* The treatment (the money spent and the output produced by the policy being evaluated);
* Outcome variables (i.e. the positive and desirable effects on the target beneficiaries);
* Covariate, also called intervening variables or confounders (i.e. other factors one must control for in order to causally attribute the positive effects on beneficiaries to the policy and not to other variables).

Formal quantitative methods for impact evaluation, both ex post and ex ante, can be characterised as stochastic in the sense that causality is problematised and determined only after processing the data measuring all of the variables mentioned above. We can further explain this with the following hypothetical example on Web Accessibility and employability:

* Existing literature may suggest the hypothesis that Increased Web Accessibility (IWA, in this case the treatment resulting from policy measures and organisations responses to them), through the short term and direct outcome of increased usage of ICT and increased ICT skills, can enable PwD to improve their chances of finding a job (employability) which represent the outcome variable of interest;
* This causal hypothesis is problematised and tested, statistical and econometric techniques are used to see: a) whether there is a correlation between IWA and, first PwD level of Internet usage and second PwD employability; and, most importantly b) whether this correlation is also a causal relation, that is to say it is attributable to IWA and not to other variables (PwD level of education, age, place of residence, etc.).

The above can be done under the conditions of having longitudinal and cross-sectional datasets on all the variables of interest (treatment, short and intermediate outcomes variables, covariates) for all the countries for which the policy is evaluated. This applies both to ex ante and ex post formal methods. The differences in the ex-ante approach are that: a) some causal parameters are taken from previous ex post evaluation and calibrated into the simulation; b) the level of the treatment variable (in our case IWA) can be included as a what if scenario ad hoc constructed). Yet, even ex ante modelling needs the same large datasets for all variables in order to run and maintain the stochastic approach in that by inputting the covariates it can recover causal relations rather than correlations.

The lack of longitudinal and cross-sectional data at EU27 level on some of the key variables prevented us to adopt any formalised quantitative ex ante or ex post impact evaluation technique that preserved the problematisation of causality (stochastic approach). The fact that we found no study of this sort whatsoever confirms this claim.

There were/are no scientifically based and empirically tested (using formal statistical or econometric techniques) impact evaluation study directly focussed on IWA:

* No randomised experiments
* No observational studies
* No scientific modelling/simulation
* As stated earlier:
  + For users level benefits we found some evidence but had to rely on application of evidence by analogy (i.e. ICT skills and employability, burden of disability as lost QALY)
  + We found even less already consolidated evidence for users’ level benefits and costs, with the exception of a few articles in scientific journals and less reliable evidence from the cases of success quoted repeatedly in non-scientific sources (i.e. Legal & General, Tesco, etc.)
* There were/are no cross-sectional and longitudinal dataset[[78]](#footnote-78) for EU27 on variables relevant for the impact evaluation of IWA:
  + Prevalence, type, and intensity (no historical time series, only cross-section available) of disabilities[[79]](#footnote-79);
  + Employment, wages, educational level (same as above);
  + The above by type and severity of disability (same as above);
  + Usage of Internet, eGovernment, eCommerce, eHealth by PwD (only one shot 2002 data and only for generically defined access to the Internet)
  + Level of Web accessibility and related costs and benefits by private sector and public sector companies (the MeAC scores now provides cross-sectional and longitudinal data in aggregate but it is not the same as having micro level data for organisations as a unit of analysis)

In view of the above limitations our aggregate quantitative projections of the outcomes (each type of benefits and costs for the different constituencies) and impacts (aggregated costs and benefits for economy and society as a whole) we have always made clear that we could not adopt any formal ex post or ex ante statistical and/or econometric and/or modelling method to produce such projections preserving a stochastic approach. We adopted instead, a theory and empirically informed deterministic approach. The nature of this approach can be further explained making again the example of IWA impact on PwD employability. In this case, however, it is not a hypothetical example but it is what we have done given the availability of evidence and data:

* We found no scientific sources exactly focussing on the relation between IWA and PwD employability;
* We found sources in the literature on the economics of ICT formally testing and demonstrating that having ICT skills increase the likelihood of being employed (with causal parameters ranging from 2% to 10% depending on the time and the geographical scope of the study, see §5.2 in Annex 5.1);
* We applied the above insight by analogy: IWA enable PwD to use ICT more and acquire skills and eventually to improve their chances to get a job;
* The causal parameters from the above mentioned studies (point b) above) are used to calculate the counterfactual employment rate for PwD: what would be the PwD employment rate if IWA would remove barriers and discrimination and enable them to gain more ICT skills and extract from them the same outcomes as the rest of the population?
* We applied the above parameters to the baseline statistics available on PwD and compare them with the same statistics for the rest of the population (i.e. level of employment), obtain the potential counterfactual level of employment for PwD under the hypothesis above and give it a monetary value using statistics on wages;
* Please note that the deterministic nature of the exercise is evident in steps d) and e) above in that we assume that the counterfactual increase in employability for PwD is entirely attributable causally to IWA. We need to do this because the lack of data prevents us from using a formal method with a stochastic approach to causality. In very simple terms this means that we cannot control for all other intervening variables such as level of education, incomes, place of residence, etc.

We have followed the same logic for all other users level benefits and also for the organisational level costs and benefits, using the hypotheses for which support was found in developing the causal model of impacts, the evidence from the field work, and a large set of statistics and additional sources (see §0 and §5.2).

* + 1. Scenarios

The final methodological element that is important to illustrate here, in order to avoid repetition and to pre-empt critiques and comments not receivable given the very clear disclaimers and premised transparently illustrated, concerns the different scenarios we have applied in the aggregate quantifications of costs and benefits.

Scenarios were defined by a combination of the counterfactual causal parameters applied and of assumption about the reach that the treatment (IWA) could have on the target (PwD or organisations). Going back to the example of IWA effect on employability of PwD we defined the scenarios as a combination of:

* Counterfactual causal parameters extracted from the literature on ICT
  + **Lower bound** applying the lowest parameter found in the literature: **2%** increase in employability;
  + **Upper bound** applying the lowest parameter found in the literature: **10%** increase in employability;
  + **Middle point**: IWA reduce the employment gap between PwD and the rest of the population **by half**;
* What proportion of the target is actually reached by the treatment:
  + **5%** of the total number of PwD aged 15-64 in EU27;
  + **25%** of the total number of PwD aged 15-64 in EU27;
  + **50%** of the total number of PwD aged 15-64 in EU27;
  + **100%** of the total number of PwD aged 15-64 in EU27;

Concerning scenarios, in the lower bound scenario we assume that the impact of Improved Web Accessibility (IWA) on employment is such that –for each age and severity group- it increases employment rates by 2%. This number is taken from studies that have been looking at the impact of ICT use on the employment rate of mature and older workers. We use this number since there is no direct evidence of the impact of IWA on employability of PwD. These counterfactual employment rates are then multiplied – for each age and restriction group- by the number of individual belonging to the group, so as to extrapolate the total employment for the group under the assumption of 2% increase as a result of IWA.

In scenario 2 we assume that –for each age group and degree of restriction- IWA reduces by half the distance between the (age and degree of restriction specific) employment rate of those reporting a LSHPD and those that do not report such situation. Notice that here –a part from age group- we still distinguish by degree of LSHPD, so that this effect generates different counterfactual employment rates (within the same age group) for those that are considerably restricted and those that are only mildly restricted. So for instance, if –for the 25-49 age group- the employment rate for those that are not restricted in Belgium in 0.814, while it is 0.699 for those who report considerable restrictions and 0,711 for those who report only a mild restriction, the effect of IWA in this scenario is to reduce the gap for those who are considerably restricted by 50% (relative to those who are not restricted at all) hence giving a counterfactual value of 0.699+0.5\*(0.814-0.699). A similar procedure is applied to those that are only mildly restricted (in which case the new employment rate would be 0.711+0.5\*(0.814-0.711). A part for the different assumption concerning the effect of IWA, when extrapolating the counterfactual employment rate, we proceed as in the previous case.

Finally we consider also scenario 3, where IWA has the effect of shifting up the employment rates of both considerably and mildly restricted individuals by 10%. This can be thought of as an upper bound, given that some studies document that ICT can have such a large impact on the employment rate for adult males. Then, for the counterfactual extrapolation exercise, we proceed as in the previous case.

We have, thus, 12 different scenarios and to each we produced 12 different aggregate quantification of the monetary value of this benefit. We proceeded in the same way for all other calculations.

In some cases the parameters from which the scenarios are defined are rooted in some form of evidence but in many cases are simply assumed by us, if you want arbitrarily. Yet, behind these somehow arbitrary choices, there is a sound theoretical and methodological reasoning. As the reader can see in Section 7, the scenarios produce a large variability in the size of the potential costs and benefits. The variability is the way we tried to include the uncertainty (that a stochastic method would have accounted for formally) within a deterministic approach to reflect the fact that: a) policy treatment can either be a success or a total failure depending on many factors; b) the effects of IWA may depend also on other variables (i.e. education) and so the lower bound/lower reach parameters may reflect that IWA per se could produce only a part of the total potential counterfactual benefits. In brief the scenarios try to account for latent and unobservable factors such as:

* Intensity and pervasiveness of police effort: extent to which policy change is actually implemented and with what level of cogency (i.e. directive only or directive that can be really enforced);
* Additional variables: even the most intense policy effort may not produce effects if large part of PwD are not aware about benefits of using Internet, or do not have other important skills obtained from formal education.

We have chosen this approach to render such uncertainty and to transparently give any reader the opportunity to freely judge and assess which of the scenarios seem more reasonable to him/her. Should we had the full set of data to analytically solve this uncertainty through a formal statistical or econometric approach we would have certainly taken this opportunity and we may have concluded that only the lowest or alternative the upper of the scenarios could be causally attribute to IWA. Yet, for reasons amply explained we could not. So, we made assumption but we cannot be asked explanation of such assumptions for the simple reasons that the data lacking for a formalised quantitative approach are also those preventing us from explaining such assumptions.

Annex 3: Causal Models for DTV and SST and Key Aspects in Details

* 1. Causal model for DTV

Figure 20: Causal model of impact for DTV

Descripción: In the users’ level of analysis, when it comes to direct primary potential accessible DTV effects, aspects include accessible DTV, and its reach, which includes skills acquisition, inclusive public services and private/social life empowerment. Intervening supply side factors include regulation/policy. 
In the organisational level of analysis, when it comes to direct primary potential accessible DTV effects, there are the costs of accessibility, operational performance operators such as revenue retailers and efficiency public administration, and compliance with legislation. 

Source: Study Consortium’s elaboration on sources cited in the text and included in the references

The diagram above explores the key and core causal relations (those identified in blue boxes and lines) which are afterwards operationalised into the key aspects and which eventually feed into the Business Case Tool and the estimation/extrapolation. The figure distinguishes the following two elements: a) the core effects and broadly defined areas of potential impact of DTV Accessibility considering both the users level and organisational level of analysis; b) the intervening supply side driving/hindering effects/factors, where within the supply side we include both the suppliers of regulations and policies (government).

* **Reach**. First of all, usage and consumption of Digital TV content does not pose the same challenges as using the Internet and so the conditions and preconditions element included earlier for the Web Accessibility. Second, TV being a familiar technology has great potential for take up on the side of individuals not very confident with other technologies (Carmichael et al, 2005, p.404). Third, Digital TV already has high penetration rates covering also remote areas not served by ADSL or other Internet access communication platforms. For all these reasons, and assuming DTV increases its accessibility, in the figure we identify a primary and important impact in terms of expanding reach and decreasing digital exclusion in a complementary fashion to Web Accessibility, from which the other follows. So, our hypothesis is that “Accessible DTV could be complementary to accessible Websites to further include digitally those individuals with disability not confident with using the Internet”. Having said that, it is highly likely that users with disability may use both accessible Websites and DTV.
* **Inclusive public services**. As stated, DTV is more likely to be accessed even by the most disadvantaged individuals among those with disability (i.e. those individuals not ready/capable to use Websites). Accordingly governmental institutions could target them with services such as health and with other public services. By bringing them the relevant personalised services local governments could better engage with local communities. So, our hypothesis is that “Accessible DTV could make public services more inclusive and, thus, benefit the most disadvantaged among people with disabilities”.
* **Acquiring skills**. If interactive, accessible DTV can be used to provide people with disabilities with educational classes remotely (Tuunanen et al 2008, p.95), that is the equivalent of eLearning. So, our hypothesis is that “Accessible DTV could increase the skills of individuals with disabilities with remotely provided educational class”.
* **Private/social life empowerment**. Being simpler and more easy to use but also less interactive of the Internet, DTV cannot be expected to produce all the impacts discussed earlier for Web Accessibility. Yet, as more interactive community services are provided, access to such services would give people with disabilities and the elderly the opportunity to participate and integrate in their social and cultural lives (empirica 2007, p. 42). So, our hypothesis is that “Accessible DTV could help individuals with disabilities to increase their leisure and other opportunities of integration into the social and cultural life of the community where they live”.
  1. Causal model for SST

Figure 21: Causal model of impact for SST

Descripción: In the user’s level of analysis, when it comes to direct primary potential accessible SST effects, aspects include accessible SST and private/social life empowerment. Intervening supply side factors include driving/hindering effects include regulation/policy. 
Organisational level of analysis
In the direct primary potential accessible SST effects include costs of accessibility, operational performance operators and compliance with legislation. 

Source: Study Consortium’s elaboration on sources cited in the text and included in the references

Also for SSTs our study does not foresee the elaboration of a Business Case Tool and the production of estimation and extrapolation. Accordingly in this case the key aspects identified and the concrete illustrations and examples found have less depth. In light of this the comment to the matrixes below will be shorter than the analysis done for Web domain.

* 1. Key aspects in details
     1. Web Accessibility user level key aspects
        1. **Monetary key aspects**
           1. **Reduced opportunity and social costs[[80]](#footnote-80)**

This is more an area of impact that can be operationalised into the following sub-dimensions:

* Less costs from unemployment benefits (as a result of individuals with disabilities leveraging accessible Websites and ICT to get a job);
* Increased tax intake (on income of newly employed);
* Reduced work days lost due to health problems;
* Reduced costs of assistance;
* Increased contribution to economy (the opportunity costs being the fact that barriers prevent people with disabilities to make this contribution)

The reason why we did not include the items above as separate key aspects is related to the facts that these are effects of the third order requiring a longer term to materialise, if ever. They certainly cannot be included in the short term Business Case Tool that we will provide to practitioners to use when presenting their proposed initiatives and projects.

* + - * 1. **Increase in employment[[81]](#footnote-81)**

There is an interaction between individual’s functions and policy/supply side effects, which leads to newly accessible ICT being appropriate. This can greatly enhance a person’s chances of finding a job (leading to increased human capital and access to online recruitment options). This can be reinforced if ICT appropriation of accessible ICT also leads to take advantage of online educational opportunities. Among the policy enablers access to integrated ICT and vocational training is strategic. This key aspect has been quantified at EU27 aggregate level (see Section 7 and Annex 5.1).

* + - * 1. **Increase in wages[[82]](#footnote-82)**

The capacity of using ICT applications and also the Internet has been shown empirically, through econometric and statistical techniques, to be linked to wage premium estimates depending the different contexts between 3% and 10%. NGOs and advocates often mention this aspect for the rights of PwD. This key aspect has been quantified at EU27 aggregate level (see Section 7 and Annex 5.1).

* + - * 1. **Increase in disposable income from entitlements[[83]](#footnote-83)**

By increasing Web Accessibility, people with disabilities will increase their capability to obtain more and better information through access online information and transactional services online, as well as support groups. In addition, the anonymity of the Internet should allow avoiding the social stigma. More information and anonymity should allow those individuals who are entitled but are not applying to obtain their benefits.

* + - * 1. **Increase in QALY (monetised)[[84]](#footnote-84)**

As widely illustrated in §4.2.1, the possibility of using the Internet to access information, support, and services can increase the health related quality of life for individuals with disabilities that can be measured in QALY. This key aspect has been quantified at EU27 aggregate level (see Section 7 and Annex 5.1).

* + - * 1. **Savings from ecommerce and internet banking[[85]](#footnote-85)**

The Internet can decrease search costs, switch costs, and lock in costs for the consumer who will suffer from diminished information asymmetry. This increase competition and drive costs down, so that buying online may offer a better quality/price ratio, or to put it differently to save money if one buys goods online as compared to buying the same good offline. In addition, it is well known that, following their channel switch strategy (the online channel cost less), banks have been trying to migrate customers from the branches to the online channel, by applying lower charges to the latter[[86]](#footnote-86). Those who cannot buy online or use Internet banking due to lack of accessibility clearly miss out on such savings. This key aspect has been quantified at EU27 aggregate level (see Section 7 and Annex 5.1).

* + - * 1. **Savings from eGovernment[[87]](#footnote-87)**

Government impose to citizens mandatory information obligations and request that they obtain services instrumental to its functioning. This amount to what is generally referred to as the administrative burden for citizens. If citizens do fulfil these obligations online they at least save time and this time can be at least valued at the minimum wage. This key aspect has been quantified at EU27 aggregate level (see Section 7 and Annex 5.1).

* + - 1. **Quantitative but non-monetary key aspects**
         1. **Increase in job retention and longer working lives[[88]](#footnote-88)**

As noted ICT represent: “For employers, it means the possibility of greater workforce productivity, the retention of older and disabled workers, and a larger labour pool to draw upon. Indeed, greater overall accessibility can help companies retain staff who have deteriorating vision, thereby avoiding job loss and moving someone onto benefits while spending time and money recruiting and training someone new” (EBU 2008, p. 25). We can add that the Vienna Study (Codagnone 2009, chapter 4) in commenting the results (ICT skills increasing employability of older workers aged 55-64) of the econometric models constructed and run explained how possessing ICT skills contribute to slow down the human capital depreciation rate and so remain longer in the work force, which also means from a macro-economic perspective less burden on pension systems.

* + - * 1. **Increase in access to entitlements[[89]](#footnote-89)**

By increasing Web Accessibility, people with disabilities will increase their capability to obtain more and better information through access online information and transactional services online, as well as support groups. In addition, the anonymity of the Internet should allow avoiding the social stigma. More information and anonymity should allow those individuals who are entitled but are not applying to obtain their benefits.

* + - 1. **Qualitative key aspects**
         1. **Increase in self-esteem and self-determination[[90]](#footnote-90)**

People’s ability to overcome disabilities, by communicating and interacting with others and doing tasks by themselves is well known in psychology to increase the self-esteem and self-determination. It also represents evidence of people with disabilities' self-realisation in their social lives and personal lives. This positively interacts with the next two key aspects.

* + - * 1. **Wider and better social relations and communication****[[91]](#footnote-91)**

Increased Web Accessibility enables people with disabilities to form richer and more value-added relationships with other individuals and groups. This can be reinforced if accessibility to virtual networks increases off-line relationships, for example, joining groups of interest to participate in group activities or events.

* + - * 1. **Increase in access to chat, support groups, web 2.090**

In particular it relates to the possibilities of people with disabilities to participate in virtual social networks. Web 2.0 eAccessibility needs to be considered as part of this key aspect. Indeed, Web 2.0 could be listed only as an enabler of other Key Aspects in this block. Yet, we decided to give it a self-standing position since some sources (mostly from engaged authors) assert that the way Web 2.0 is rapidly spreading and adding new Accessibility barriers, if not tackled by policy and regulation, could lead to entire new forms of digital exclusion for the people with disabilities.

* + - * 1. **Increase in everyday autonomy****[[92]](#footnote-92)**

Web Accessibility can increase the number of everyday activities that people with disabilities could do by themselves. As well known, in psychology this increases the self-esteem and self-determination and, so, interacts positively with some of the previous aspects.

* + - * 1. **Increase in access to leisure and culture91**

People with disabilities can have access to eBooks, online news, games and all the other cultural and leisure products and services due to a better Web Accessibility. This can be reinforced if the eAccessibility enables access to offers and opportunities for the “offline” world (e.g. buying theatre tickets or accessing to better touristic offers).

* + - * 1. **Increase in political participation[[93]](#footnote-93)**

Web Accessibility can help people with disabilities take advantage of the Internet to gain better and more updated information about the main issue debated in the public sphere, exchange ideas with others, and eventually increase their participation to politics. This can be further enabled by access to Web 2.0.

* + 1. Web Accessibility organisational level key aspects
       1. **Monetary key aspects**
          1. **Increase in sales[[94]](#footnote-94)**

This benefit is quoted by a large array of practitioners generated sources that seem, however, to self-referentially reuse the same few facts over and over again. At any rate this aspect can also be looked from a broader perspective as an improvement in marketing strategy and customer retention. This potential benefits is the result of several other key aspects having to do with expanded reach and technical improvements that are presented below. This key aspect has been quantified at EU27 aggregate level (see Section 8 and Annex 5.1).

* + - * 1. **Cost reductions from technical improvements[[95]](#footnote-95)**

The technical characteristics of Web Accessibility results in the reduced costs determined by the following elements: a) decreased personnel costs for site maintenance; b) decreased server capacity and costs[[96]](#footnote-96); c) decreased costs for multiple format sites[[97]](#footnote-97); d) decreased costs for new technology upgrading[[98]](#footnote-98).

* + - * 1. **Monetised efficiency gains for public administrations[[99]](#footnote-99)**

If citizen use eGovernment services this means that governments received already digitalised information and save: a) the time of employees that would have been required if the same services are provided in traditional way; b) other overhead costs (i.e. dematerialisation). A UK study estimates that each online transaction saves about €18 to governments (Freshminds UK online centres 2008, p. 17). This key aspect has been quantified at EU27 aggregate level (see Section 7 and Annex 5.1).

* + - * 1. **Costs reduction from channel switch[[100]](#footnote-100)**

For organisations that provided printed materials in alternate formats (large print, embossed Braille, computer disk), an accessible Website can reduce the demand for alternate formats when people chose to use the Web, thus saving some production and distribution costs.

* + - * 1. **Personnel costs[[101]](#footnote-101)**

There is an initial effort needed for training and coaching Web site managers, and content designers and developers in eAccessibility. It is related to readiness efforts that Web designers and content developers have to pay for acquiring more suitable eAccessibility tools and learning how to use them. Some organisations hire consultants or employees with accessibility expertise. These costs include: a) Training and skills development costs; b) New experienced employees costs; c) External expertise costs; Web Accessibility mainstreaming costs[[102]](#footnote-102); d) Web Accessibility auditing costs[[103]](#footnote-103); These costs can be reduced if Web Accessibility standardisation initiatives on Web design and Web content development working processes are also considered and applied. Dedicated tools and techniques can also help in cost reduction.

* + - * 1. **Capital investment costs[[104]](#footnote-104)**

Investments that a given organisation makes in technology, including: a) Evaluation tools costs[[105]](#footnote-105); b) Assistive technology costs[[106]](#footnote-106); c) Technologies Upgrading costs[[107]](#footnote-107).

* + - * 1. **Additional development costs[[108]](#footnote-108)**

Additional time is required for Web content developers and authors in order to create accessible Websites and content. The type of content affects cost. For example, multimedia is more costly to maintain. In particular a Website with little multimedia content will have fewer on-going costs, as opposed to a multimedia content Web site.

* + - * 1. **Monitoring/testing costs[[109]](#footnote-109)**

Organisations really committed to steadily provide accessible sites need to conduct testing and devote resources to monitoring and management of Web Accessibility. This results in a number of potential costs such as: a) Early users test costs[[110]](#footnote-110);b) Users validation (before release) costs; c) Quality assurance costs; d) On-going end-user evaluation approach costs; d) Disability Network Coordinator costs[[111]](#footnote-111); e) Awareness raising costs[[112]](#footnote-112); f) Procurement monitoring costs[[113]](#footnote-113);

* + - 1. **Quantitative but non-monetary key aspects**

The first two key aspects below are the underlying factors that can produce the increase in sales. So, they are explained below with little additional considerations.

* + - * 1. **Larger audience reach[[114]](#footnote-114)**

Web Accessibility expand reach, not only because of more people with disabilities access an organisation's Website, but also by tapping into other targets such as family and friends of people with disabilities, as well as older people. On this last issue it is worth mentioning separately a few sources substantiating logically and empirically why also older people may be a target beneficiary of Web Accessibility and quantifying such target (see among others Arch 2008a and 2008b; Work Research Centre 2003 and 2008; empirica & Work Research Centre 2008).

* + - * 1. **Better rank in search engines, reduction in search, navigation and download times[[115]](#footnote-115)**

If the key aspect above is the marketing side of potential increase in sales, this comprises the technical advantage that improve the efficiency and effectiveness of user experience, thus, increasing the likelihood that the visitors will conclude an online purchase or any other kind of transaction.

* + - * 1. **Increase in employee’s productivity[[116]](#footnote-116)**

Provided that organisations make their internal Web based applications accessible and that the pool of older employees and/or employees with disabilities have the needed digital skills, the productivity of the latter will increase. In a study commissioned by Microsoft, for instance, Forrester Research estimated that 62% of all workers in the U.S. would be more productive if ICT instruments and services were made more Accessible (Forrester Research 2003).

* + - * 1. **More effective recruitment process[[117]](#footnote-117)**

With an online accessible recruitment platform organisations can enlarge the pool for recruitment tapping into new talents and reduce unnecessary recruitment costs/Time, at least this is what the study summarised here shows. McKinsey & Co (2003) in a pro-bono study carried out for the UK-based Employment Forum on Disability (EFoD) – titled Making eRecruitment Barrier-free for People with Disabilities – provide the following main findings: a) At least 1.3 million people with disabilities of working age in the UK face ongoing exclusion because companies are using inaccessible eRecruitment Websites; b) Building an eRecruitment site which is barrier-free is no more expensive than building an inaccessible site; c) Making an existing Website accessible may cost on average less than five% of total development expenditure. This investment can significantly increase market share by improving the accessibility and usability of a site for all users, d) Accessible e-Recruiting also lowers maintenance costs, enhances reputation and reduces legal liability.

* + - 1. **Qualitative key aspects**
         1. **Improvement in social responsibility and image[[118]](#footnote-118)**

Web Accessibility can improve the image and brand of an organisation (so also potentially contributing to increase operational performance) and can also be adopted to improve its Corporate Social Responsibility activities.

* + - * 1. **Compliance with legislation[[119]](#footnote-119)**

Web Accessibility is evidently a way of complying with existing and future legislation by removing barriers for people with disability. It can also reduce the risk of lawsuits or legal action.

* + 1. DTV user level key aspects
       1. **Quantitative but non-monetary key aspects**
          1. **Increase in reach**

DTV will give Governments the potential to reach the “disadvantaged” with services, such as Health and local community, thus increasing their quality of life (Carmichael et al, 2005, p.404). From the users’ perspective such services would improve access to information and services (e.g. dentist appointment scheduling) and can provide new ways of engaging with local communities.

* + - * 1. **Bridging digital divide**

Due to TV’s high penetration rates, it has the potential to give access to services and products to those who do not have access to other technology, thus reducing the “digital divide” (Smith & Webster, 2008, p.772). Being a familiar technology, it is believed to encourage the take up amongst those who otherwise feel apprehensive of technology.

* + - 1. **Qualitative key aspects**
         1. **Increase in broadly defined empowerment**

Increasing broadly defined empowerment and increasing participation in the society have been illustrated by Tuunanen, Myers & Cassab (2008, p.95). In the authors’ example interacting with TV can lead to creation of interactive programmes where viewers are encouraged to affect the course of a programme. With the accessible DTV users with disability will be able to increase their participation in society through affecting the course of such programmes. We believe that individuals will feel empowered through being able to independently interact with the features of DTV, something that people without disabilities are already able to do.

* + - * 1. **Improved access to leisure**

The Audio Visual Directive recognises the “the right of persons with a disability and the elderly to participate and integrate in the social and cultural life of the Community [which is] inextricably linked to the provision of accessible audiovisual media services” and “the accessibility of audiovisual media services includes, but is not restricted to, sign language, subtitling, audio-description and easily understandable menu navigation” (Empirica, 2007, p.42). It is therefore recognised that by increasing access to all TV content and interactive features, people with disabilities and the elderly will have an equal the opportunity to participate and integrate in social and cultural lives.

* + - * 1. **Increase in interactive learning**

An interesting vision for DTV was presented by Tuunanen, Myers & Cassab (2008, p.95) whereby accessible interactive TV can allow people with disabilities and the elderly to participate in educational classes remotely.

* + 1. DTV organisational level key aspects
       1. **Monetary key aspects**
          1. **Increased sales**

One of the quantitative key aspects on the organisational level is the increased revenue from new interactive service and targeted marketing. As stated by Chorianopoulos (2007, p.2) personalised advertising implemented through DTV will improve marketing efficiency.

* + - * 1. **New revenue streams**

Delivering public services directly to the user’s home would make such services cheaper to administer (Smith & Webster, 2008, p.772). There are also opportunities for new revenue streams as a result of the new paid DTV services. Additionally, extra benefits come from the release of analogue waves for reuse back into the public domain (DTI et al, 2005, p.5). As quoted by Carmichael et al (2005, p.408), the BBC estimate the value of analogue waves to be around £10 billion, making it a valuable asset for the UK Government.

* + - * 1. **Costs of new solutions from scratch**

The choice of accessibility options on Digital TV solutions is currently limited to audio descriptions and subtitles. Although this is an improvement compared to analogue TV, it is still lagging behind compared to the accessibility solutions available on the Web. To fill this gap, both hardware and software solutions have to be re-built with accessibility in mind (Rice & Alm, 2008). This would include providing alternative high-contrast and large text colour schemes for EPGs and interfacing with assistive technologies, such as screen readers, voice activation software, and switches. The costs of building new more accessible solutions includes include the cost of software, hardware, and integration. Achieving integration and consistency between different service providers and manufacturers will be more challenging compared to the Web, due to the lack of accessibility guidelines and too many stakeholders leading to “decreased responsibility” (Rice & Alm, 2008, p.2)

* + - * 1. **Costs of digital switchover**

The costs associated with the digital switchover are obtaining new transmission equipment, decommissioning analogue transmitters, marketing and communication costs, extra energy costs, and planning, management and operating costs of the switchover (DTI et al, 2005, p.2).

* + - * 1. **Support and marketing costs**

There is a cost of running a support scheme for digital switchover, taking into account such factors as population, the price of support visits (will vary according to the population), training of support staff, management and administration of the scheme.

Population and its percentage considered “vulnerable” (e.g. registered blind, people receiving Disability Living Allowance (DLA, adjusted for people receiving DLA due to blindness), and over 75 years) (Ofcom Consumer Panel, 2004, p.34).

* + - 1. **Quantitative but non-monetary key aspects**
         1. **Increased audience/coverage**

TV is already reaching wide audiences due to its high penetration rate. The “extended coverage” of DTV will increase coverage to previously unserved areas, thus further increasing the potential audience (DTI et al, 2005, pp.3-5).

* + - 1. **Qualitative key aspects**
         1. **Consistency through collaboration**

One of the benefits on organisational level, as identified by Klein, Karger & Sinclair (2003, p.8) is the opportunity for collaboration between technology and service providers. This implies better compatibility and integration between set-top boxes, television sets and VCRs and other audio-visual equipment. The authors argue that through collaboration, consistent interfaces will be produced and will result in greater ‘social learning’. Collaboration will also lead to creation of standards, similar to the already existing standards on the Web. Adherence to these standards could be a unique selling point for technology and service providers. This key aspect, according to the authors also presents a potential cost saving for product support and ‘channel costs’, such as training of staff, under the assumption that user familiarity of products will require less support.

* + - * 1. **Compliance with legislation**

The new Audiovisual Media Services Directive already includes accessibility within its scope, encouraging media service providers to “gradually” make their services more accessible to users with visual or hearing disabilities. However, the impact of EU policies on broadcasters within Europe remains weak and moderate for most European states (Empirica, 2007, pp.52-53). The report suggests that future EU policy address the new challenges posed by DTV. In line with this recommendation, the Audiovisual Media Services Directive has given member states the deadline to transpose the Directive into national law by the end of 2009[[120]](#footnote-120). With the likely strengthening of DTV accessibility policies upon member states, media service providers who implementing captioning, audio-descriptions, signing, and simple navigation menus will be in a better position to comply with the legislation.

* + 1. SST user level key aspects
       1. **Monetary key aspects**
          1. **Increase in consumer welfare[[121]](#footnote-121)**

The deployment of SSTs in several sectors of the economy (such as banking, retail, education, health care, food service, transport, or government services) has grown in recent years, according to market trends towards self-service points of interaction with consumers and the massive use of credit and debit cards (that has also an influence in the number of SST installed, such as ATMs)[[122]](#footnote-122). As a consequence, consumption patterns evolve and customer demand a wider and deeper portfolio of goods and services that can be reached through SSTs.

Table 35 below shows some transactions that users can perform through these devices (such as ticketing, checking-in or ordering food in restaurants), in a fast, private and independent way. However, the lack of accessibility on SST leaves an important population segment at disadvantage (including not only people with disabilities but elderly citizens, people lacking digital literacy skills and older workers, among others), who may not be able to fully operate them.

Table 35: List of typical transactions per sector

| **SECTOR** | **TRANSACTIONS THAT CAN BE PERFORMED THROUGH SSTs** |
| --- | --- |
| Government | * Information * Tax payment * Vehicle registration/license renewal |
| Health care | * Self-service patient check-in * Prescription dispensing * Provide insurance information * Processing payments * Checking medical appointments * Receive relevant health care information independently, privately, quickly and without the need to wait in line. |
| Education | * Automated registration * Financial aid information * Course catalogues * Directories * Way finding * Academic & athletic event calendars * Student ID validation * Administrative announcements |
| Retail | * Print money-saving coupons on site * Products ordered on-line in stores * Check-out counters * Dispensing products without human staff and payments |
| Travel and Transport | * Manage air, hotel, train, and rental car reservations, ticket/token distribution and bill payment * Airline check-in (get boarding passes, select seats) * Automating schedule and route information |

Source: Law Office of Lainey Feingold (2010)

* + - 1. **Qualitative key aspects**
         1. **More participation to the public sphere/politics: eVoting[[123]](#footnote-123)**

Voting in an election is considered to be an essential part of the democratic process; eVoting stands for "electronic voting", and refers to both the electronic means of casting a vote and the electronic means of tabulating votes. Nowadays it is possible to vote through SST in some countries, but these devices are not always accessible[[124]](#footnote-124). The regulations, practices and facilities for people with disabilities to vote in public elections vary from country to country. eVoting systems must be designed and operated to ensure the reliability and security of the voting operation, and they must be accessible and easily usable by as many people as is technically possible.

* + - * 1. **Increased convenience[[125]](#footnote-125)**

The trend towards Self-Service in the market has a direct impact on the availability of information, products and services; consumers can use Self-Service Terminals on a 24/7 basis, in places such as hotel lobbies, hospitals, transport stations or groceries and perform multiple transactions without the intervention of any staff. Therefore, consumers can obtain an improved service in a more convenient way (avoiding queues or waiting), and become more loyal and satisfied. For instance, the airline industry has begun to make Self-Service Terminals available at sites apart from airport terminals. These “check-in desks” may soon be found in hotel lobbies, convention centres, and shopping malls, etc. This evolving pattern will enable passengers to check baggage and conduct other transactions at times and places of their convenience.

* + - * 1. **Increase in everyday life autonomy[[126]](#footnote-126)**

Senior citizens, people with disabilities and other population groups would be benefited by an increase in the accessibility level of SST (they would be able to fully operate an SST in a fast and independent way, indeed enhancing their self-esteem). For example, the Self-Service model reduces or in some instances eliminates the requirement for airline personnel to “interface” for passengers, allowing passengers to perform tasks for themselves such as obtaining boarding passes or selecting seats. In the transport sector, Self-Service Terminals can be used to help customers to orientate themselves in the terminals in order to navigate it independently.

* + 1. SST organisational level key aspects
       1. **Monetary key aspects**
          1. **Increased sales[[127]](#footnote-127)**

As mentioned in the previous section, the range of services that are offered through accessible SSTs has increased in recent years, and consumers are becoming more used to operate them; therefore, it is reasonable to suggest that the number of completed transactions through SST rise as well as the sales obtained through these devices. Other reasons behind this increase in sales/profit are the expanded customer base that can be reached if Self-Service Terminals are fully accessible.

* + - * 1. **Monetised efficiency gains[[128]](#footnote-128)**

Many information technology applications – like Self-Service Terminals and online banking – substitute for expensive labour inputs and have proven to be economically efficient at relatively small scale. Companies adopting Self-Service Terminals assert that they eliminate tedious repetitive work, free staff to deliver an improved “customer service”. The value of these time-savings (in terms of efficiency gains) could be monetised. For example, eGovernment initiatives allow better communication with citizens and a more efficient public administration, which can result in tax reductions (benefiting public at large). Shrinking budgets have forced many government offices to deploy Self-Service Terminals (with measurable and long-term Return on investment -ROI-). In sectors such as transport and health care, Self-Service Terminals can reduce transaction and staffing costs, and increase customer service and satisfaction.

* + - * 1. **Cost reductions from technical improvements[[129]](#footnote-129)**

Technical improvements applied to Self-Service Terminals, such as alternative interfaces (visual, audio, tactile, assistive devices, mobile phones & PDAs) and biometrics, can decrease manufacturing and maintenance costs. One of the advantages of biometric systems[[130]](#footnote-130) is that users may not need a PIN (personal identification number) to operate Terminals, making easier to use them and providing a greater level of security; in fact, many users would prefer methods which do not require physical contact between the individual and the device[[131]](#footnote-131), as well as having a personalised interface[[132]](#footnote-132). An increasing number of Self-Service Terminals, such as bank Automated Teller Machines (ATMs), ticket machines and information points, are moving away from incorporating physical control panels and buttons and towards touchscreen technology to reduce maintenance costs and improve customers’ experience.

* + - * 1. **Costs of redesigning SST[[133]](#footnote-133)**

In general, SSTs such as ATMs are expensive (with a low replacement rate) and slow process. Some technologies might be obsolete, or installation standards might have changed over time (as stated in the previous section). Manufacturers confirm that they foresee no significant technical obstacles to development and deployment—using existing technology—of fully accessible Self-Service Terminals. Moreover, vendors decline to estimate the costs either of developing the new systems or of retrofitting the existing ones, but they agree that the hardware costs (i.e., circuit boards, keypads, audio jacks) are negligible. The “real costs”, as they put it, are in the software reprogramming necessary to utilise the features of a hardware interface; On average, only 8% of all ATMs installed by the EU's two main retail banks provide ‘talking’ output (enabling self-service for customers with visual impairments). A leading retail bank has installed them but only in six Member States. Since regulation outside Europe requires "talking output", many manufactures already incorporate this functionality; however it is often not activated.

* + - * 1. **Additional costs or building an accessible self-service terminal from scratch[[134]](#footnote-134)**

A leading authority on accessibility technology estimates that the costs of access hardware and software modifications for a fully accessible system would not exceed one percent, at most two percent, of a Self-Service Terminal system’s—hardware and software development—entire cost. This estimate is based on use of existing access technology (i.e., EZ Access) and design standards. Adapting the physical structure of the SST normally has to be done when designing or installing it, because retrofitting is usually very expensive. Software adaptations in new models can be done at any time with minimal cost penalties (but not all organisations monitor that updates to the ordinary software on the terminal affects the accessibility of the terminal).

* + - 1. **Quantitative but non-monetary key aspects**
         1. **Increase in audience[[135]](#footnote-135)**

When implementing accessibility in Self-Service Terminals, companies deploying these devices can reach a wider audience comprised by market segments such as people with disabilities, elderly consumers or people fearing machine interface, which would be able to privately, independently and consistently complete transactions. Furthermore, improving usability and accessibility of the terminals can help to meet the demands of current customers. As a consequence of targeting a larger pool of consumers, purchasers of accessible SST have an opportunity to increase their sales.

* + - 1. **Qualitative key aspects**
         1. **Improvement in social responsibility and image[[136]](#footnote-136)**

One of the reasons behind the purchase of Accessible SST may be the Corporate Social Responsibility (CSR) policy of the organisations. CSR is not limited to the company alone, it also covers the supply chain; there is a market trend to demand suppliers that implement “inclusive design” on the products or services purchased by governments, companies and other organisations. The number of companies committed to adopt accessibility as part of their CSR is increasing, creating opportunities for suppliers of accessible products such as accessible Self-Service Terminals.

* + - * 1. **Compliance with legislation[[137]](#footnote-137)**

There is a lack of direct attention to accessibility of Self-Service Terminals in current policy at EU and Member State levels, but legislative or other measures should be introduced to encourage Member States (and ultimately manufacturers and those in charge of deployment) to ensure that Self-Service Terminals are accessible to people with disabilities. The lack of appropriate standards (in terms of mandatory requirements) on accessibility of Self-Service Terminals is a problem for manufacturers; as there are different specifications in each country, there is confusion among designers and manufacturers, who develop different models for different countries (and thus increasing costs). Only when there is relevant legislation, the guidelines are applied in a consistent manner. Moreover, eAccessibility situation is better in countries with strong regulation, which does not constitute a barrier to a fully competitive ICT market. On the contrary, legal requirements on eAccessibility have set a level playing field for companies and led to new business opportunities. eGovernment policy (Inclusion of eAccessibility criteria in public procurements of ICTs) can be an important mechanism for improving eAccessibility. Self-Service Terminals constitute a new channel of interaction with clients and if they are inaccessible, an important segment of the population can be prevented from receiving information, product and services through them. Basic principles of non-discrimination suggest that every person must have equal access to the portfolio offered in SST, and therefore no one must be excluded from a full participation in society.

Annex 4: Empirical Work Sources/Design

* 1. Wide ranging desk research

For the purpose of carrying out this task the Consortium performed very wide Web based search of sources integrated by search in electronic databases of scientific articles and other materials. The web based search captured all type of sources (scientific articles, institutional reports and practitioners’ generated evidence). The search on the database focused more deeply on scientific articles. The database used included:

* Academic Search Premier: valuable and comprehensive scholarly and multi-disciplinary full-text database. Provides citations and abstracts for more than 8,500 journals, with full text for more than 4,600 of those titles.
* ACM Digital Library: provides bibliographic information, abstracts, reviews and full text articles in computer science and information technology, published in ACM periodicals.
* Business Source Complete: scholarly database, providing a collection of business related journals. Covers all areas of business, including accounting, economics, finance, management, management information systems, marketing and international business.
* Communication & Mass Media Complete: it offers numerous journals in communication, mass media, and other closely-related fields of study to create a research and reference resource for the communication discipline.
* Econlit: The American Economic Association’s electronic bibliography; it indexes more than thirty years of economics literature from around the world, including journal articles, books, book reviews, collective volume articles, working papers and dissertations.
* Google Scholar: it provides a simple way to broadly search for scholarly literature across many disciplines and sources: articles, theses, books, abstracts and court opinions, from academic publishers, professional societies, online repositories, universities and other Web sites.
* IEEE Electronic library: library containing all the proceedings of the IEEE conferences and related publications.
* Informa: provider of “specialist information and services for the academic and scientific, professional and commercial business communities”.
* Information Science & Technology Abstracts: a resource to researchers interested in libraries and information management, providing coverage on subjects such as librarianship, classification, cataloging, bibliometrics, online information retrieval, information management and more.
* ISI Web of Knowledge: research platform that provides access to contents and powerful tools to search, track, measure and collaborate in the sciences, social sciences, arts and humanities.
* Pubmed: health related publication database. It contains scientific and non-academic papers in all the medical disciplines.
* Regional Business News: provides full text for more than 80 regional US and Canadian business publications
* Sciencedirect: An information source for scientific, technical, and medical research.
* Scientific Commons: aims to provide the most comprehensive access to scientific knowledge on the internet. Core functions are to provide the identification of repositories, the indexing of full-text documents, the extraction of author relationships and personalisation services.
* Scirius: engines dedicated to scientific matters.
* SpringerLink: international database providing access to “journals, book series, reference works and the Online Archives Collection”.
* The Serials Directory: provides access to the most up-to-date and accurate bibliographic information as well as current pricing structures for popular serials.
* Web of science: valuable and comprehensive scholarly and multi-disciplinary full-text database. Provides citations and abstracts for more than 12,000 journals, with full text for more than 6,200 of those titles.
  1. Field level evidence full results
     1. The two questionnaires and respondents’ profiles

The first questionnaire was circulated to organisations and companies and it investigated the costs related to the development and maintenance of their institutional Websites with a special focus on aspects associated with Web Accessibility.

Forty-three responses were received and analysed. The companies that took part in the survey came from six Member States – UK, Sweden, Germany, Spain, Portugal, Hungary and Italy. Further to that, two companies described themselves as Pan-European. These companies are involved in different sectors of activity (see Table 36 in descending order, please also note that respondents could choose more than one sector of activity, therefore the numbers do not add to 100%).

Table 36: Respondents Profiles

| **Numerosity and Sector of activity** | **Percentage** |
| --- | --- |
| 17. Other (including voluntary, community and NGO groups) | 30% |
| 14. Public Administration | 28% |
| 10. Financial and Insurance Services | 12% |
| 15. Education | 9% |
| 9. Information and Communication | 9% |
| 16. Health | 7% |
| 12. Professional, Scientific and technical services (legal, accounting, architecture, advertising, veterinary, research and university) | 5% |
| 3. Electricity and gas supply | 5% |
| 7. Transportation and storage | 5% |
| 1. Agriculture, forestry, fishing and mining | 2% |
| 5. Construction | 2% |
| 6. Wholesale and retail trade | 2% |
| 13. Administrative services (employment, travel, security, buildings etc) | 2% |

Source: Study Consortium’s elaboration

Almost one third of the companies are either an NGO or a Public Administration body. The other sectors of the companies’ activity include financial and insurance services (12%), education (9%), information and communication (9%) and health (7%). Regarding the size of the companies, 40% of the responses were from small enterprises (up to 50 employees) and almost the same number (37%) from large enterprises (more than 250). Only 19% of the respondents work for a medium size enterprise. The second questionnaire was more specifically addressed to IT companies specialised in providing Web Accessibility related products and services. The main objective of this survey was to gather information on their fees for Web Accessibility consultancy and the costs for the development and maintenance of accessible Websites. Almost 30 companies specialised in Web Accessibility across Europe have been approached and 11 consultancies provided responses to the questionnaire. Both questionnaires are available online at <http://www.eaccessibility-impacts.eu/>.

* + 1. Respondents’ website profile

To estimate the size of the respondents’ Websites and their popularity the questionnaire included questions about the number of pages, number of page views and unique visitors. The results show that a 29% of Websites had less than 100 Web pages, 24% had between 100 and 1000, 29% had between 1001 and 10,000 pages and finally 17% have more than 10,000 pages. 40% of the Websites receive more than 50,000 visitors per month and 39% have between 1,000 and 50,000 unique visitors. As far as the page views are concerned 44% have more than one million page views per month and 37% between 10,000 and 1 million a month. Comparing this data with the number of visitors per month and page views per month, we can distinguish between large, popular Websites (40% of the sample) and smaller but still rather popular Websites (40% of the sample). The remaining 20% have not provided us with traffic data concerning their Web site. Finally, the questionnaire included a question on groups of visitors their Website receives and targets. Almost 38% of visits come from citizens, which obviously is a result of the predominance of NGO’s and Public Administration in the sample. 14% of the traffic comes from Public Sector organisations and only 6% from business and private sector organisations (see figure below).

Figure 22: Group of Web visitors

Source: Study Consortium’s elaboration

The majority of the Websites concentrate on providing information, the average proportion of information-focussed pages is 64%. Less than one third of the Web pages are interactive and only 7% transactional.

Figure 23: Website function

Source: Study Consortium’s elaboration

* + 1. Reasons for introducing web accessibility

All the companies, in the respondents’ view, consider the accessibility of their Website is important (72% of the respondents consider that it is very important for their organisation to have an accessible Web site and another 22% that it is important). In order to see whether their Websites were redesigned to be accessible due to an increasing awareness and the emergence of the Web Accessibility standards, the respondents were asked to provide the Website launch date. 42% of the Websites were launched between 1992 and 1999, thus before WCAG 1.0 guidelines were published. 32% were launched between 2000 and 2005 and around 30% after 2005. More than 50% of the Websites were designed to be accessible from the start and 41% were made accessible at a later date; this corresponds almost exactly with the number of Websites launched in the 1990’s. The Websites launched before 1999 were not designed as accessible from the start due to the lack of awareness and international standards regarding Web Accessibility or it was not considered as a priority at that point in time. 65% of these Websites were redesigned to meet Web Accessibility requirements after 2005, 32% were redesigned between 2002 and 2005. As far as the reasons for launching an accessible Website are concerned, these include compliance with the legal requirements, support of the company CSR policy and the aim of widening the number and characteristics of users. Respondents also mentioned the goal of targeting users and customers with disabilities. Finally, the commercial and/or NGO bodies who cooperate and contract with Public Administrations on eAccessibility issues were obliged to meet Web Accessibility standards. There is a strong overlap of this data with the key reasons for redeveloping the Website to meet the eAccessibility guidelines. What was new, in the responses to the question concerning redesign, was the fact that respondents also mentioned usability issues and issues concerning the need to improve the social image of their business or organisation. The majority of the Websites were developed either by external consultancy (44%) or in a partnership between their own staff and external consultants (34%). Only 17% were developed in-house. Out of those developed by external consultants or in a partnership, 58% of the respondents noted that the consultant did not originally raise the eAccessibility issue while building the Website compared to the 42% that did mention it. Once again, taking into account the fact that more than 40% of the Websites were designed in the 1990’s, the percentage of answers to the preceding question suggests that consultancies probably are now making customers aware of issues concerning eAccessibility.

* + 1. Web accessibility standards, testing and monitoring

The majority of respondents reported their websites to be compliant with the WCAG 1.0 or 2.0 AA levels (55% and 60% respectively). 27% are compliant with the AAA level of WCAG 1.0 and 20% with WCAG 2.0. The results show that only around 20% of companies are satisfied with the lowest level of compliance. However, these estimations are self-reported and should not be taken as an accurate and representative indication of accessibility levels. It would be necessary to conduct expert reviews of all the pages of each of the websites to WCAG guidelines to establish an accurate degree of accessibility.

Figure 24: Does your site currently meet any of the following accessibility criteria?

Source: Study Consortium’s elaboration

71% of the companies use expert testing, 56% use automated testing and 54% use user testing (54%). Only 10% of the respondents do not use any kind of testing to assess their accessibility level, see the Figure below. 54% of the companies use third-party certification and 27% rely on self-declaration of conformity. Moreover, another 12% of them use both methods of accessibility testing.

Figure 25: How do you test your accessibility level?

Source: Study Consortium’s elaboration

The respondents mentioned several methods of getting information on changes in the eAccessibility requirements and new trends. The majority of them keep up to date by reading information on the Web (blogs, specialised portals, government Websites, fora and mailing lists). Several respondents are directly involved in the eAccessibility projects.

* + 1. Web accessibility costs

The respondents were asked to assess the significant (i.e. costly) factors of Web site development.

Figure 26: Significant (costly) factors of Web site development

Source: Study Consortium’s elaboration

Figure 27: Composite index of significant (costly) factors of Web site development

The figure shows a compound index generated by attributing scores to the responses shown in Figure 26: high = 3, medium = 2, low = 1 index point.

Source: Study Consortium’s elaboration

Figure 27 uses a composite index to show the relative significance of factors identified in Figure 26. The most significant cost factor in developing a Web site was the use of external consultants and experts. In house Web development was the next most significant cost. Three items incurred slightly lower levels of costs there were Web Accessibility audit costs, cost of additional ICT infrastructure and equipment as well as cost of training personnel.

The two questions and corresponding figures dealt with the costs specifically related to making the website accessible.

Figure 28: How significant/costly the factors below were in enabling accessibility at your Website

Source: Study Consortium’s elaboration

Figure 29: Composite index of significant/costly factors of Accessible Web site development

The figure shows a compound index generated by attributing scores to the responses shown in Figure 28: high = 3, medium = 2, low = 1 index point. Source: Study Consortium’s elaboration

The highest costs for enabling accessibility of a Website are fees incurred by contracting external consultants. The second most significant costs were Web Accessibility audit costs, third were in-house Web development costs. The least significant factors are the cost of personnel training and cost of additional ICT infrastructure and equipment. Comparing the answers on significant factors of Web site development (Figure 28) and the same factors to ensure the accessibility of a Website (Figure 29) we see that the relative significance of costs is very similar whether first developing a Web site or whether one subsequently makes it accessible. Less than one third of the respondents provided details about the annual real costs of developing and maintaining their Websites. Out of 12 responses, two Websites cost less than €10,000, four between €10,000 and €100,000 and six more than €100,000, including one with a cost of over €1 million which is a platform with 40 accessible portals. The same number of respondents answered the question on average monthly Website cost updates and administration. Four companies related it to the salary cost of the Website administrator, another two estimated the cost as less than €1,000. Five thought it was between €1,000 and €10,000 and five estimated costs of more than €10,000, including one which incurred costs of more than €100,000.

* + 1. Web accessibility benefits

Only a quarter of the respondents have already evaluated the benefits of increased Web Accessibility, but only a small number of these companies keep track of relevant data. Thirty-one percent of respondents are planning to undertake evaluation in the future and 47% do not plan to undertake evaluation activities to access benefits to users. Figure 30 over page provides details about the perceived importance of different accessibility factors

Figure 30 shows a composite index generated by attributing scores to the responses shown in Table 37 below: high = 3, medium = 2, low = 1 index point. In the respondents view, the highest significances of benefits, in the descending order, are:

* improved social image
* compliance with legislation
* usability and ease of use
* more visitors with disabilities, older people and less literate users

Table 37: Benefits of Web accessibility: the views of the respondents (in percentage)

| **Benefits of accessibility** | **More visitors to the Web site** | **More visitors with disabilities, and less literate users to the Web site** | **Lower bounce rates (indicating higher visitor retention)** | **More online sales** | **More offline sales** | **Enhanced usability and ease of use** | **Efficiency gains from more effective interaction on transactions** | **Cost savings from a channel switch to your online site** | **Improved social image** | **Compliance with legislation** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1. High | 37 | 58 | 29 | 9 | 10 | 83 | 33 | 24 | 78 | 63 |
| 2. Medium | 34 | 28 | 38 | 33 | 13 | 6 | 31 | 21 | 16 | 33 |
| 3. Low | 24 | 14 | 18 | 18 | 37 | 6 | 4 | 29 | 5 | 0 |
| 4. None | 5 | 0 | 15 | 39 | 40 | 6 | 31 | 26 | 0 | 5 |

Source: Study Consortium’s elaboration

Figure 30: A composite index of accessibility benefits (relative significance of different factors)

Descripción: The figure shows the following: 
Improved social image: 128
Compliance with legislation: 126 
Enhanced usability and ease of use: 116
More visitors with disabilities, older people and less literate users to the website: 111
More visitors to the website: 103
Efficiency gains from more effective interaction or transactions: 103
Lower bounce rates: 93
Cost savings from a channel switch to your online site: 74
More online sales: 64
More offline sales: 59


Source: Study Consortium’s elaboration

Other important benefits, for around one third of the respondents, include: more visitors in general, efficiency gains from more effective interaction or transactions, lower bounce rates and cost saving from a channel switch to an online site. In the respondents view, the least important factors are more online and offline sales. This answer is likely to be affected by the predominance of Public Administrations and non-profit organisations in the sample. The results show that the perceived benefits are linked first and foremost with the operational performance of the Website, i.e. the usability enhancement and user-friendliness. Moreover, the general improvement in social image (especially as a part of a wider Corporate Social Responsibility strategy) is also, in the respondents view, very important for the company. As mentioned before, an improved social image is one of the most important reasons for launching or revamping their Website in order to meet eAccessibility standards. The benefits of these improvements are, in the respondents’ views, a decrease in user complaints, a better profile in media publications and public reports, and for the UK Websites the “two ticks accreditation” (a symbol that indicates that an employer has made a commitment to supporting or employing people with disabilities[[138]](#footnote-138)).

The respondents also underlined the importance of external factors, most notably compliance with legislation (and possibly with the associated benefit of avoiding legal costs and fines arising from litigation). More than half of the respondents see further benefits in increasing the number of people with disabilities, older people and less literate users that utilise their Website. Other benefits of eAccessibility, mentioned by the respondents, comprise increased usability and easier maintenance such as the cross-platform compatibility, faster loading time, search engine optimisation (a higher Google ranking), increase in page views and unique visitors, information credibility, improved stakeholders’ relationship. Nevertheless, some of the companies, after a re-launch of their Website did not observe any increase in sales, transactions or number of visitors.

The respondents were also asked, if possible, to provide data on possible benefit gains after making their Website accessible. Since only 25% of respondents have evaluated the benefits of accessibility and this ‘sub-group’ comprised only a handful of companies there was an insufficient response rate to further analyse these organisations.

* 1. Case studies’ research design and data collection

Generalisation from case studies may be of dubious credibility if the cases are not selected according to a reasoned research design. Case studies should be context-embedded in the sense of reflecting the peculiarities of the sectors they operate in and of their size. This requires a careful selection of cases to reflect sectorial and size differences and it is also important to select cases reflecting differences in the degrees and results of the phenomenon studies. Below we illustrate the principles informing our case study design.

* + 1. Embedded multiple-cases approach

From the typology of case study approaches developed by Yin (2003), a multiple-cases embedded approach has been applied, where several cases embedded into different contexts are considered in order to increase the potential for generalisation and to check evidence from case studies among each other. This approach is adopted to investigate a general phenomenon that is known to take different forms in different contexts. In this case, the sector (type of activity) influences the kind of benefits an organisation can achieve and, to some extent, the magnitude of the costs. Therefore, the sector has been chosen as the context where multiple cases are considered. On the other hand, size also matters, and it has been considered in the selection of cases within each sector (context).

* + 1. Triangulation

The principle of methods and data triangulation typical of case study research has been followed. The expression ‘triangulation’ is used in the relevant literature to indicate the practice of using different sources of data and collection methods to reinforce the robustness and soundness of the analysis. Qualitative and quantitative data within a single case, as well findings from different cases, will be triangulated to confirm findings. The principle of triangulation will be used also in the sense of checking case-level evidence against the aggregate statistics and information gathered and vice versa, and eventually linking case-level evidence to aggregate extrapolations.

* + 1. Number of cases

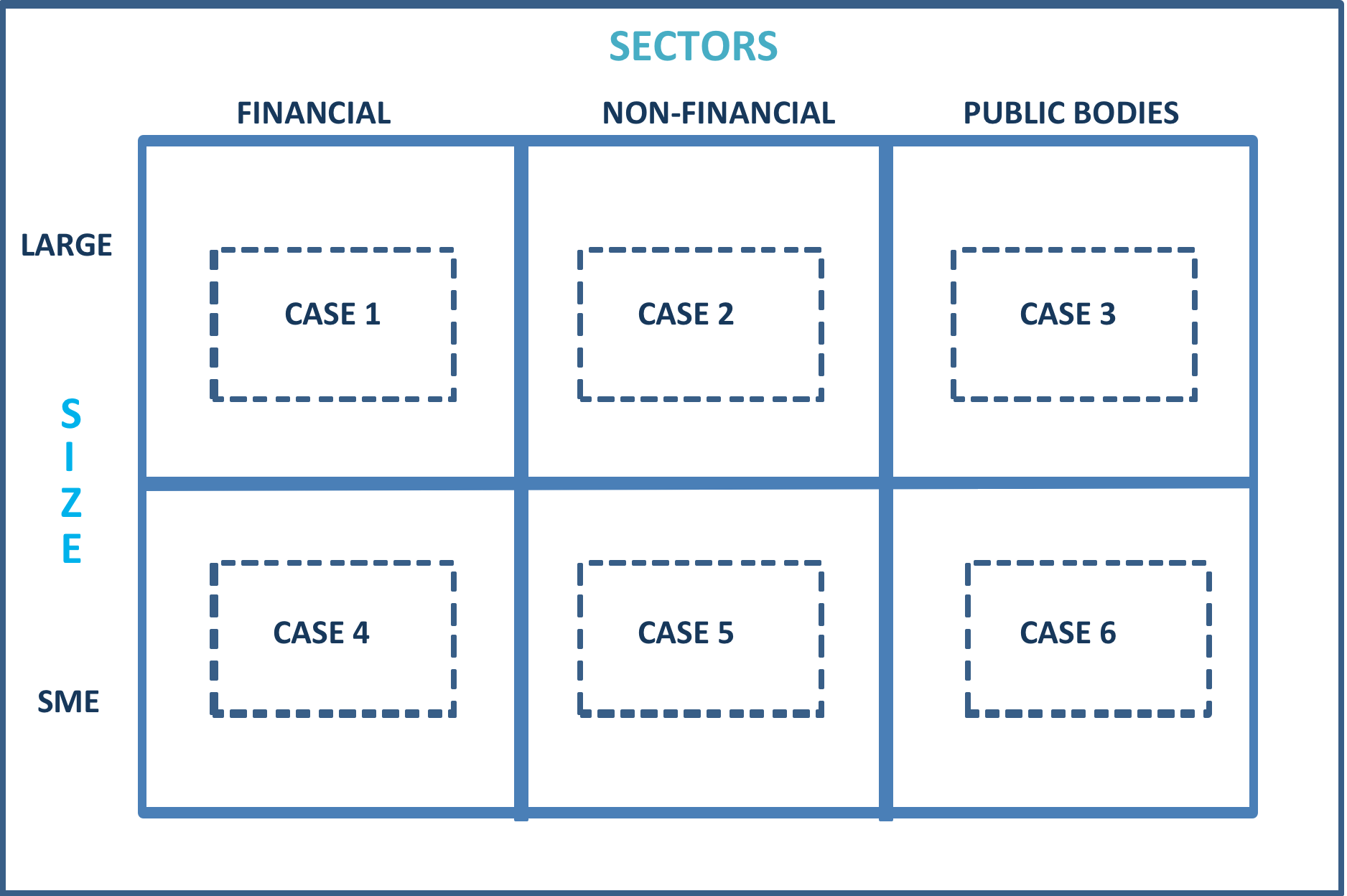
The final element in research design is the total number of cases; given the nature of the problem at hand and the two principles defined earlier (representation of sectors and context), it derives that for any given cluster, it was needed at least 6 cases, as illustrated in the exemplificative matrix below (Figure 31).

Therefore, as a result of the research design explained above, the final number of cases collected is 24:

* 2 organisation sizes:
  + Large organisations vs. Small and Medium enterprises (SME)
* 3 different contexts (sectors):
  + Financial
  + Non-Financial
  + Public bodies
* 4 clusters of countries, according to the Networked Readiness Index[[139]](#footnote-139)

2 x 3 x 4 = 24 Case studies

Figure 31: Case studies design simplified snapshot



Source: Study Consortium’s elaboration

Such a design enables each of the selected sectors to have evidence both on a large and on a small or medium-sized organisation, in three different sectors (financial, non-financial and public bodies), which increases the soundness and explanatory power.

According to the European Commission[[140]](#footnote-140) definition, Enterprises qualify as micro, small and medium-sized enterprises (SMEs) if they fulfil the summarised in Table 38 below. In addition to the staff headcount ceiling, an enterprise qualifies as an SME if it meets either the turnover ceiling or the balance sheet ceiling, but not necessarily both.

Table 38: European Commission criteria on SMEs definition

| **Enterprise category** | **Headcount** | **Turnover** | **or** | | **Balance sheet total** |
| --- | --- | --- | --- | --- | --- |
| medium-sized | < 250 | ≤ €50 million | | ≤ €43 million | |
| small | < 50 | ≤ €10 million | | ≤ €10 million | |
| micro | < 10 | ≤ €2 million | | ≤ €2 million | |

Source: European Commission[[141]](#footnote-141)

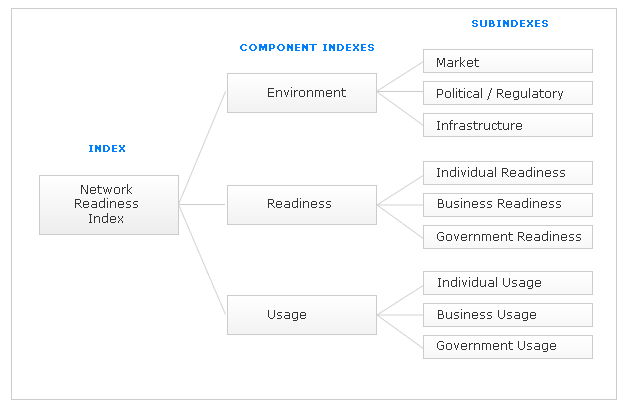
The findings of the differently sized firms will help further test and specify the influence of size on costs and benefits. Furthermore, comparing the evidence gathered for each sector we will also further test and specify the influence of the sector of activity on costs and benefits. However, as per the EC definition of a SME, all organisations consulted for Case Studies in the financial sector are considered large companies.

Finally, the country where the organisation is located is also important, as the development of ICT, eAccessibility and Web accessibility (in particular) is different across EU Member States. The variable country is also required in order to extrapolate the results of the Study. In the non-financial sector, the Study Consortium has tried to diversify the profiles of companies consulted, recalling the list of different purposes of ICT use listed in the Tender Specifications (p. 2); The list includes:

* Work and employment;
* Purchase of goods and services;
* Access to information of public interest;
* Assistance and care, emergency interventions;
* Education and training;
* Leisure and entertainment, social networking.
  + 1. Clustering countries

In order to cluster the countries according to a relevant criteria the Study Consortium initially proposed to use the statistical information presented in the Study SMART 2008-0066 "Monitoring eAccessibility in Europe"; however, as this study gathered information only for a selection of EU Countries, it was considered not suitable for carrying out future tasks such as estimation and extrapolation for each EU Member State. So, we opted for the Networked Readiness Index (NRI)[[142]](#footnote-142), produced by the World Economic Forum for 133 economies worldwide, measures the leverage of ICT advances for increased growth and development. The NRI identifies the most relevant factors facilitating ICT readiness, with three different components indicated in the figure below:

Figure 32: Networked Readiness Framework



Source: <http://www.networkedreadiness.com/gitr/main/analysis/framework.cfm>

This index is used to benchmark country’s performance and versus other economies, identifying national ICT strengths and weaknesses, and evaluating progress over time. The 27 EU Member States (plus Norway) have been segmented into four clusters, comprised by 7 countries (except cluster 1 that includes Norway and cluster 4 which has 6 countries), according to the score obtained in the Networked Readiness Index (NRI):

Table 39: Clusters of countries according to their NRI

| **Cluster** | **Country/Economy** | **Rank** | **Score** |
| --- | --- | --- | --- |
| CLUSTER 1 | Sweden | 1 | 5.65 |
| CLUSTER 1 | Denmark | 3 | 5.54 |
| CLUSTER 1 | Finland | 6 | 5.44 |
| CLUSTER 1 | Netherlands | 9 | 5.32 |
| CLUSTER 1 | Norway\* | 10 | 5.22 |
| CLUSTER 1 | United Kingdom | 13 | 5.17 |
| CLUSTER 1 | Germany | 14 | 5.16 |
| CLUSTER 1 | Luxembourg | 17 | 5.02 |
| CLUSTER 2 | France | 18 | 4.99 |
| CLUSTER 2 | Austria | 20 | 4.94 |
| CLUSTER 2 | Belgium | 22 | 4.86 |
| CLUSTER 2 | Ireland | 24 | 4.82 |
| CLUSTER 2 | Estonia | 25 | 4.81 |
| CLUSTER 2 | Malta | 26 | 4.75 |
| CLUSTER 2 | Slovenia | 31 | 4.51 |
| CLUSTER 3 | Cyprus | 32 | 4.48 |
| CLUSTER 3 | Portugal | 33 | 4.41 |
| CLUSTER 3 | Spain | 34 | 4.37 |
| CLUSTER 3 | Czech Republic | 36 | 4.35 |
| CLUSTER 3 | Lithuania | 41 | 4.12 |
| CLUSTER 3 | Hungary | 46 | 3.98 |
| CLUSTER 3 | Italy | 48 | 3.97 |
| **CLUSTER 4** | **Latvia** | **52** | **3.90** |
| **CLUSTER 4** | **Slovak Republic** | **55** | **3.86** |
| **CLUSTER 4** | **Greece** | **56** | **3.82** |
| **CLUSTER 4** | **Romania** | **59** | **3.80** |
| **CLUSTER 4** | **Poland** | **65** | **3.74** |
| **CLUSTER 4** | **Bulgaria** | **71** | **3.66** |

Source: Own elaboration using data gathered from

The Global Information Technology Report 2009-2010. World Economic Forum. <http://www.networkedreadiness.com/>

\*Norway has been included in order to represent European Economic Area (EEA) countries.

* + 1. Structured and standardised data gathering.

For the sake of validity and comparability, although case studies were conducted through in depth interviews, nonetheless the interviewers followed a structured framework as to ensure some level of comparability between the evidence from the case studies and the FLEQ and to enable us to extract some summarising finding from the qualitative material. Below a snapshot of this structure is provided, whereas the full questionnaire filled in by the interviewer after the interviews is available at: <http://www.eaccessibility-impacts.eu/>.

Figure 33: Structure of case-level data gathering

Descripción: This figure discusses the following:
Categorisation is divided into specific sector, turnover, total number of employees, number of disabled and/or older employees, target segments.
Costs and benefits is divided into monetary cost/benefit analysis, image or compliance, other non-monetary benefits, and technical improvements. 
Web accessibility is divided into level, since when and governance.
Website/intranet is divided into size, complexity, purpose, technology, and maintenance.
Motivators (or lack of) is divided into law, CSR policy, ROI, funding, and skills.


Source: Study Consortium’s elaboration

As regards collection methods, the Study Consortium confirmed in early research that already constructed case studies do not entirely cover the requirements of the research design proposed for this study; therefore, after building from scratch our own Case Study template (based on the Field Level Evidence one), the Study Consortium collected the Case Studies through e-mail and telephone interviews, selecting key organisations and actors to consult in 11 EU countries.

Once the documentation was gathered, it was rendered into a more discursive format, containing all qualitative information provided by respondents. Case Studies were intended to cover the following topics:

* Organisation’s profile/Executive summary
* Organisation’s background and objective
* Corporate Social Responsibility (CSR) strategy
* Corporate Website as a tool for delivering public services/marketing tool
* Accessibility within the organisation
* Main problems identified
* Web accessibility implementation
* Web accessibility maintenance
* Impact attained
* Lessons learnt

The case studies, presented in full in Deliverable D3, included the following:

* + - 1. **Cluster 1**
* Public bodies

1. DEFRA (Public Body National). United Kingdom.
2. Birmingham City Council (Public Body local). United Kingdom

* Financial companies

1. Axa (Financial Large). United Kingdom/France.
2. Large financial company. United Kingdom[[143]](#footnote-143)

* Non-Financial companies

1. BT (Non-financial large). United Kingdom.
2. Funka-Nu (Non-financial small). Sweden.
   * + 1. **Cluster 2**

* Public bodies

1. DILA (Public Body National). France.
2. Mayo County Council (Public Body local). Ireland

* Financial companies

1. Permanent TSB (Financial large). Ireland[[144]](#footnote-144).

* Non-Financial companies

1. Mazars Group (Consultancy/Financial large). France.
2. Trinity College Dublin University (University). Ireland.
   * + 1. **Cluster 3**

Public bodies

1. UMIC (Public Body National). Portugal.
2. Junta de Castilla y León -JYCL- (Public Body Local). Spain.

Financial companies

1. Banco Comercial Português, S A. (Financial Large). Portugal.
2. Generali (Financial Large). Italy.
3. La Caixa (Financial Large). Spain.

Non-Financial companies

1. Red Eléctrica Española (REE) (Non-financial Large). Spain.
2. Idea Futura (Non-financial Small). Italy.
   * + 1. **Cluster 4[[145]](#footnote-145)**

Public bodies

1. Ministry Of Transport, Construction and Regional Development -MDPT- (Public Body National). Slovak Republic.

Other organisations

1. Apeirons (NGO). Latvia.
2. Ngo Media (ICT small company). Poland.
3. Onphr -Organisation of Romanian Disabled People’s Associations- (NGO). Romania.
4. Dostępny.net (ICT). Poland
5. Nikolaos Floratos (NGO). Greece
   1. Business case tool cost categories in details
      1. Training and skills development

According to several web accessibility consultancies contacted, there are usually three different types of training on web accessibility, depending on the contents to be taught. The workshops and courses described below are intended for technical personnel (attendees are expected to have thorough knowledge of HTML and at least intermediate level with CSS).

Complexity I: One day Workshop

* Objectives:
  + Give an overview of the concept of web accessibility and its relevance.
  + Show how people with disabilities access the Web, the assistive technologies most commonly used, and the barriers caused by lack of compliance with the accessibility criteria
  + Introduce the attendees to WCAG, the different levels of success criteria, and the differences between WCAG 1.0 and WCAG 2.0.
  + Train the participants in 10 golden rules that solve 80% of the accessibility barriers when correctly applied.
  + Indicate a set of automatic, semiautomatic and manual tools, the different characteristics of the web browsers and assistive technologies, and the techniques that will enable staff to assess compliance of the accessibility criteria by their websites.
* Contents:

Unit 1. Concept and importance of the web accessibility (1.5 h.)

* + Disability, concepts and types
  + How people with disabilities use the Web
  + Assistive technologies and alternative strategies for using the Web
  + Current situation and access barriers
  + Multiple ways of access and user diversity on the Web

Unit 2. Introduction to WAI guidelines (1.5h.)

* + Introduction to the Web Content Accessibility Guidelines (WCAG)
  + WCAG levels and success criteria
  + Transitioning from WCAG 1.0 to WCAG 2.0
  + Interpreting the new WCAG 2.0

Unit 3. Ten golden rules for accessible web sites (3 h.)

* + Provide text alternatives
  + Structure content
  + Avoid dependence on a single sense
  + Make all functionality keyboard accessible
  + Give users enough time
  + Avoid interferences
  + Identification of hyperlinks and contents
  + Consistent navigation interface
  + Help users avoid mistakes
  + Ensure compatibility

Unit 4. Accessibility assessment of websites (1 h.)

* + Evaluation tools: automatic, semiautomatic and manual
  + How web browsers work and how to use assistive technologies in
  + Accessibility evaluation
  + Techniques for evaluating different web content

Complexity II: Three day Workshop

In this three-day web accessibility training course, it would be desirable to run a practical training session where participants can practice with their own computers.

* Objectives: All the Complexity I objectives plus:
  + Show how people with disabilities access the Web, and alternative browsing strategies beyond the desktop computer (e.g. mobile web access)
  + Introduce participants to W3C initiatives, the essential principles of its guidelines and the different levels of success criteria.
  + Provide a complete set of techniques and knowledge that will enable technical staff to incorporate accessibility criteria in all aspects of their everyday work with web technologies, and consequently, to eliminate the accessibility barriers of the corporate websites.
  + Enable the technical staff to carry out accessibility assessment of internal and external websites, by providing them with a set of automatic, semiautomatic and manual tools, a thorough knowledge of the different tools and strategies for accessing the web, and of the techniques required for evaluating compliance with accessibility criteria.
* Contents:

Unit 1-4 plus:

Unit 5. HTML documents and semantic value of the elements

* + Headings markup
  + Itemized lists, creation and application
  + Specifying the language of the page and of parts
  + Identification of abbreviations and acronyms
  + Accessibility of hyperlinks

Unit 6. Images, colour and text alternatives

* + Images and image maps
  + Colour analysis
  + Embedded objects
  + Multimedia

Unit 7. Accessible data tables and forms

* + Markup of simple and complex tables
  + Information about table content
  + Form elements
  + Markup, association and grouping of label and user interface
  + controls

Unit 8. Tools for Web access

* + Assistive technologies for accessing web content
  + Alternative browsing strategies
  + Accessibility features of the main web browsers

Unit 9. Accessibility assessment of websites

* + Assessment tools: automatic, semiautomatic and manual
  + Function of the web browsers and the assistive technologies in the accessibility assessment
  + Techniques to assess the different contents

Unit 10. Layout models of websites

* + Frames
  + Layout tables
  + Layout with CSS positioning

Complexity III: Five day Workshop

In this five-day web accessibility training course, it would be desirable to run a practical training session where participants can practice with their own computers.

* Objectives: All the Complexity I & II objectives plus:
  + Train the attendees in other external technologies (namely: PDF, Flash and JavaScript), its accessibility features and techniques for complying with accessibility criteria when using such technologies.
* Contents:

Units 1-10 plus:

Unit 11. Non-W3C technologies and content

* + JavaScript
    - Pros and cons
    - Web standards (ECMAScript)
    - JavaScript applications
  + Flash
    - Accessibility in Flash
    - Assistive technologies and Flash
    - Text equivalents in Flash
    - Accessible components
    - Development of accessible documents with ActionScript
  + PDF
    - Analysis of the accessibility of a PDF document
    - Structure, text alternatives and language identification
    - Repair of PDF documents

Assumptions:

* Training is not dependent on designing a web from scratch/redesigning it.
* Training is not dependent on the client´s type of website but the topics the client would like to learn about.
* Workshops are taught by external consultants with an expert knowledge on web accessibility
* Training hours are the same whether the teacher is a third party consultancy specialised in web accessibility or not. What will be different is the price per working day/hour of each organisation
* Training working days are only attributable to web accessibility; however, some techniques taught during the course may be used also for improving web management, design, usability, SEO, web positioning, etc.
* Travel expenses have not been included, as they are not directly attributable to web accessibility, but they have to be considered in case the training is carried out in a foreign country, for example.
* It is important to remark that, as it happens with other training received by employees, there is an opportunity cost for the time that each employee is away from his/her desk not performing their assigned daily tasks, and should be taken into account by managers. This opportunity cost has not been taken into account in this tool.
  + 1. Design, programming, and content production

Web accessibility experts have estimated the time required to implement accessibility in each element of the website. Moreover, these elements have been grouped in three categories (informative, interactive and transactional), as follows:

Table 40: Estimated time/effort required to make each element accessible

| **Profile** | **Elements** | **Estimated Time** |
| --- | --- | --- |
| INFORMATIVE | Metadata (set) | 0,5 hours per metadata set |
| INFORMATIVE | Images | 0,042 hours per image |
| INFORMATIVE | Headings (set) | 0,5 hours per headings (set) |
| INFORMATIVE | Content table | 2 hours per table |
| INFORMATIVE | Simple forms (up to 10 fields) | 2 hours per form (simple) |
| INTERACTIVE | Complex forms (from 11 fields and/or with programming) | 8 hours per form (complex) |
| TRANSACTIONAL/ MULTIMEDIA | Transactional processes | 8 hours per transactional process |
| TRANSACTIONAL/ MULTIMEDIA | PDF (simple) | 2 hours per PDF (simple) |
| TRANSACTIONAL/ MULTIMEDIA | PDF (average) | 4 hours per PDF (average) |
| TRANSACTIONAL/ MULTIMEDIA | PDF (complex) | 8 hours per PDF (complex) |
| TRANSACTIONAL/ MULTIMEDIA | Multimedia (simple) | 2 hours per multimedia (simple) |
| TRANSACTIONAL/ MULTIMEDIA | Multimedia (average) | 4 hours per multimedia (average) |
| TRANSACTIONAL/ MULTIMEDIA | Multimedia (complex) | 8 hours per multimedia (complex) |

Source: Web accessibility experts

Moreover, the number of certain elements per website or template has also been estimated for the respondent, as shown in Table 41 below:

Table 41: Estimated elements per page/template

| **Elements** | **Average Number of Elements** |
| --- | --- |
| Metadata (set) | One metadata per template |
| Headings (set) | One headings set per template |
| Content table | One content table per 25 pages |
| Simple forms (up to 10 fields) | One simple form per 50 pages |
| Complex forms (from 11 fields and/or with programming) | One complex form per 200 pages |

Source: Web accessibility experts

Concerning the number of images, web accessibility experts estimated the following (please note that this refer to the number of images not repeated in other pages of the website):

Table 42: Estimated number of images

| **Pages** | **Images per Page** |
| --- | --- |
| <=100 pages | 5 images |
| >100 and <=500 pages | 4 images |
| >500 and <2000 pages | 3 images |
| >=2000 pages | 2 images |

Source: Web accessibility experts

Regarding PDF documents, for simplification purposes they have been divided into simple, average and complex, depending on its contents and source, according to the table below:

Table 43: PDF types

| **Profile** | **Content** | **Source** |
| --- | --- | --- |
| SIMPLE | Text  Images | Word processors |
| AVERAGE | Text  Images  Complex images  Tables | Adobe Tools |
| COMPLEX | Text  Images  Complex images  Tables  Complex tables  Forms | Other (ie.QuarkXPress ) |

Source: Web accessibility experts

Finally, with respect to multimedia content, they have been also classified as simple, average and complex, depending on the type of interaction they allow with web users (little interaction, some interaction including choosing between options and full interaction, respectively).

Assumptions:

* Websites have been developed using authoring tools
* When an organisation plan to make a new website, the more aspects to consider, the more cost will have to be paid. Therefore, when implementing web accessibility in their websites, organisations usually take the opportunity to start using authoring tools, changing the graphic design of the site, etc. A natural consequence of accessibility improvements are better SEO ranks or usability. As these elements are closely related to web accessibility, it is not possible to completely isolate them, as one benefits the others; building a high-quality website involves doing all of them at the same time (following a holistic approach), but budget constraints usually impedes it.
* According to the research conducted, there is no difference in terms of price about using CMS with blogs accessible or inaccessible. However, it is not possible to calculate how much it costs to make an inaccessible blog accessible, as it differs from case to case.
* The cost of integrated applications has not been considered for two main reasons: Firstly, it is very difficult to estimate an average of the cost as it is case specific. Secondly, this cost is not directly attributable to web accessibility.
* Costs of the transactional profile refer to the higher difficulty involved (security, integration with other in-house applications that may be not accessible, etc)
* Converting inaccessible PDF´s into accessible requires a lot of effort in terms of working hours, so the more PDFs the website has, the more expensive and complex it is; moreover, PDFs which are images are more costly to render accessible than those formed on the basis of word processing or spreadsheets, especially if these are already accessible. Other formats that could potentially substitute PDF´s in the near future are a matter of controversy. Whereas some argue that formats such as ePublishing allow the same functions as PDF´s (and could be cheaper to make accessible), other experts disagree (as unlike ePub, PDFs can include a layer format which it allows to add a layer to the structuring of content). Technology evolves fast and this could be a topic for future research.
  + 1. Accessibility assessment and first certification

The following estimations have been made for the first evaluation of a given website, depending on the organisations choice (to self-assess its website, to hire an external organisation or both). Please note that an in-depth assessment of the website is the first step to be able to certify the accessibility level.

Table 44: Estimated time required for the first web accessibility assessment

| **Options** | **Profile** | **<500 Pages** | **>500 and <2000 Pages** | **>2000 Pages** |
| --- | --- | --- | --- | --- |
| Self-Assessment | Informative | 7,25 WD | 10,87 WD | 14,49 WD |
| Self-Assessment | Interactive | 8,45 WD | 12,08 WD | 15,70 WD |
| Self-Assessment | Transactional | 12,08 WD | 15,70 WD | 19,32 WD |
| Third Party Evaluation | Informative | 7,25 WD | 10,87 WD | 14,49 WD |
| Third Party Evaluation | Interactive | 8,45 WD | 12,08 WD | 15,70 WD |
| Third Party Evaluation | Transactional | 12,08 WD | 15,70 WD | 19,32 WD |
| Both (Self-Assessment and Third Party Evaluation) | Informative | 14,49 WD | 21,74 WD | 28,98 WD |
| Both (Self-Assessment and Third Party Evaluation) | Interactive | 16,91 WD | 24,15 WD | 31,40 WD |
| Both (Self-Assessment and Third Party Evaluation) | Transactional | 24,15 WD | 31,40 WD | 38,64 WD |

Source: Web accessibility experts

Concerning certification, there are two possibilities, as reflected in Table 45 below: the organisation can self-declare that the website is accessible (“Self-Declaration of Conformity”), or it can hire another organisation in order to certify the accessibility level (“3rd Party Certification“, indeed with a quality seal):

Table 45: Estimated time required for the first web accessibility certification

| **Options** | **Profile** | **<500 Pages** | **>500 and <2000 Pages** | **>2000 Pages** |
| --- | --- | --- | --- | --- |
| Self-declaration of conformity | Informative | 0,25 WD | 0,25 WD | 0,25 WD |
| Self-declaration of conformity | Interactive | 0,25 WD | 0,25 WD | 0,25 WD |
| Self-declaration of conformity | Transactional | 0,25 WD | 0,25 WD | 0,25 WD |
| Third Party Certification | Informative | 3,32 WD | 5,13 WD | 6,04 WD |
| Third Party Certification | Interactive | 4,23 WD | 5,13 WD | 6,94 WD |
| Third Party Certification | Transactional | 5,13 WD | 6,94 WD | 7,85 WD |

Source: Web accessibility experts

Assumptions:

* Assessment of web accessibility as well as its Certification is dependent on the type of the website (informative, interactive and transactional) and the number of pages
* Working hours needed to assess a website are the same if done by a third party or own staff, assuming that all of them have the same expertise on web accessibility
* If assessment is made both by own staff and external consultants, it is assumed that working days are assigned 50% each
* Self-declaration of conformity has been estimated in 2 working hours
* 3rd party certification is usually valid for two years. In order to allow comparability of data, this cost has been divided into 2, in order to calculate the annual cost included in the table.
  + 1. Incorporating web accessibility procedures into web management

Web accessibility may change some procedures when managing a website. Experts have estimated that the average time required to evaluate and change procedures in order to be aligned with a corporate total quality management strategy are:

Table 46: Estimated time required for incorporating web accessibility procedures

| **Profile** | **Working Days** |
| --- | --- |
| Informative | 5 |
| Interactive | 10 |
| Transactional | 15 |

Source: Web accessibility experts

Assumption: Incorporating accessibility into procedures is dependent on the client´s type of website.

* + 1. On-going annual costs

The following estimations have been made for the annual evaluation and certification of a given website:

Table 47: Estimated time required for the annual web accessibility assessment

| **Profile** | **<500 Pages** | **>500 and <2000 Pages** | **>2000 Pages** |
| --- | --- | --- | --- |
| Informative | 1,81 WD | 3,02 WD | 3,62 WD |
| Interactive | 2,42 WD | 3,02 WD | 4,23 WD |
| Transactional | 3,02 WD | 4,23 WD | 4,83 WD |

Source: Web accessibility experts

Table 48: Estimated time required for the annual web accessibility certification

| **Options** | **Profile** | **<500 Pages** | **>500 and <2000 Pages** | **>2000 Pages** |
| --- | --- | --- | --- | --- |
| Self-declaration of conformity | Informative | 0,25 WD | 0,25 WD | 0,25 WD |
| Self-declaration of conformity | Interactive | 0,25 WD | 0,25 WD | 0,25 WD |
| Self-declaration of conformity | Transactional | 0,25 WD | 0,25 WD | 0,25 WD |
| Third Party Certification | Informative | 3,32 WD | 5,13 WD | 6,04 WD |
| Third Party Certification | Interactive | 4,23 WD | 5,13 WD | 6,94 WD |
| Third Party Certification | Transactional | 5,13 WD | 6,94 WD | 7,85 WD |

Source: Web accessibility experts

Assumptions:

* Assessment of web accessibility as well as its certification is dependent on the type of the website (informative, interactive and transactional) and the number of pages
* Working hours needed to assess a website are the same if done by a third party or own staff, assuming that all of them have the same expertise on web accessibility
* If assessment is made both by own staff and external consultants, it is assumed that working days are assigned 50% each
* Self-declaration of conformity has been estimated in 2 working hours
* 3rd party certification is usually valid for two years. In order to allow comparability of data, this cost has been divided into 2, in order to calculate the annual cost included in the table.

Annex 5: Quantitative Projections in Detail

* 1. Statistics and sources used

Below we provide the full list of the statistics gathered, analysed and used to produce the aggregate projections presented in this document.

* Eurostat Labour Force 2002 Survey on individuals aged 15-64 reporting Long Standing Health or Disability Problems (LSHDP, see more in Annex 1.1);
* The European Union Statistics on Income and Living Conditions (EU-SILC, see more in Annex 1.1);
* Eurostat households surveys on broadly defined Information Society for:
  + Internet usage;
  + eCommerce usage;
  + Internet Banking usage;
  + eGovernment usage;
* 2002 Eurobarometer Survey on Internet Usage, which to date is the only EU15 level source where there are data specifically reporting the level of Internet usage among PwD (Having a LSHPD does not necessarily imply difficulties in working or undertaking normal activities – 33% report that they are not restricted in the kind or amount of work they could do or their mobility to and from work. Proportions vary considerably across countries – from under 10% in three Member States to over 50% in another three – these proportions tending to vary in some degree with the level of prosperity of countries, perhaps reflecting the extent of assistance available. Considering all of the above, 10% of all men and women aged 16-64 report that they are restricted in the kind or amount of work they can do, their mobility to and from work, or some combination of these.
* 33% of those with a long-standing health problem or disability (LSHPD) report that they are not restricted in the kind or amount of work they could do or their mobility to and from work. This means that 10% of all men and women aged 16-64 in Europe report they are restricted in the kind or amount of work they can do, their mobility to and from work, or some combination of these.
* In the EU as a whole, 63% of those aged 16-19 who were considerably restricted in their ability to work participated in education or training compared to 83% of those who were not restricted at all.
* the proportion of people of working age who are considerably restricted in their ability to work who were in employment in 2002 averaged only 28% in the EU (unadjusted figure is 24%) as compared with 68% of those not restricted.

Source: APPLICA & CESEP & ALPHAMETRICS (2007, pp. 8-18)

* Statistics included in the above set on Information Society, but generated by Capgemini, on the indicator of full online availability of public services (eGovernment supply side statistics);
* 2006 Eurostat Structure of Earnings Survey for wages;
* WHO burden of diseases and disability dataset;
* Eurostat Structural Business Statistics on:
  + Number of enterprises by size and sector;
  + Enterprise employment by size and sector;
* Eurostat Enterprise survey of 2009 containing a module on the number of enterprises obtaining revenues from eCommerce and on the share of their revenues generated by eCommerce;
* We started from the long list of Nomenclature of Territorial Units for Statistics (NUTS[[146]](#footnote-146) entities) provided in the EU defined nomenclature, we elaborated a small programme to process this file, and we calculated the total number of administrative public entities existing in EU27. This was instrumental to the estimation of the total number of public websites in EU27, which in turn was used to calculate the cost of making them accessible for the public sector;

To complement the above, we interviewed (on a confidential basis) the professional who designed and managed the eGovernment supply side benchmarking (between 2002 and 2007) to understand how the sample of 14,000 public website (yearly surveyed for the benchmarking) were identified with respect to the total universe of public website addressing the 20 basic public services benchmarked.

* 1. Literature on ICT

A growing body of literature studying the effects of new technologies on employment and the wage distribution has emerged in the past ten to fifteen years. This literature is based on the hypothesis of partial complementarity between ICT and labour: ICT has a positive impact on skilled workers productivity and hence on their employability, while it substitutes for unskilled workers[[147]](#footnote-147). This effect increases the incentives to accumulate human capital but it also increases wage differentials between skilled and unskilled workers and leads to higher relative unemployment for unskilled workers (see Juhn et al, 1993; Katz and Murphy, 1992; Krueger, 1993; DiNardo and Pischke, 1997; Berman et al., 1998; Brunello et al., 2000; Biagi and Lucifora, 2008). In particular, empirical evidence (see Miniaci and Parisi, 2005; Miniaci and Parisi 2006) shows that these effects tend to be age-specific: given that ICT skills are concentrated in the adult and young generations, a rapid pace of technological progress in ICT producing sectors and a high rate of ICT adoption in ICT using sectors can lead to a decline in (relative) productivity of older generations, making their exit from the labour market more likely.

Given the impact of ICT on relative wages and relative unemployment, the issue of equal access to technology (and ICT in particular) becomes essential in preventing the rise of unacceptable differences. This is particularly true when considering the role of disabilities: access to the use of ICT should not be more difficult for people with a disability status, which points to the crucial role of improved web accessibility. However, there is no direct evidence of the impact of improved web accessibility on disabled workers employability and wages and so we have to argue by analogy, using the existing studies for the non-disabled.

The ability to use technologies has been shown to be positively correlated with real wages, so that more technologically skilled individuals (even after controlling for individual fixed effects) receive a wage premium (Acemoglu 1998, 2001; Juhn et al., 1993; Haisken-DeNew et al. 2004; Katz and Murphy, 1992; Krueger 1993; Di Nardo and Pischke, 1997). However on the size of such wage premium there has been a long debate. Cross-sectional estimates of a standard wage equation carried out for the United States (see Krueger, 1993, and Juhn et al.,1993) showed that the inclusion of a dummy for ‘working with a computer’ is not only significant but the wage premium associated with computer use ranges from 15% to 17% and has not shown a substantial decline over time (that is from late 1980s to the early 2000s). Similar cross-sectional studies with individual data carried out in Germany and France showed an almost identical wage premium. This evidence, however, did not go unchallenged and requires further specification. Indeed the initial estimates produced by Krueger were technically biased (see for instance Di Nardo and Pischke 1997; Entorf and Kramarz 1997), in the sense that they do not control for potentially unobserved variables, such as the individual ability of workers. If ICT resources are not assigned at random but rather given to the workers who are more able in general, then the relation between IT skills and wage differential is spurious. Alternative estimates produced correcting such technical problem and using longitudinal panel rather than cross-section data have still proven the existence of a wage premium for digital skills, but of a much lower order of magnitude (between 5% and 6% depending on the countries).

When coming to employment the evidence of the impact of ICT is less abundant. Falk (2001) using firm level data ( the first and second wave of the Mannheim Service Innovation panel), finds that for German firms the introduction of new organisational practices and new ICT in the production process tend to be followed by employment growth. Similar findings are shown also in other studies using firm level data (Koellinger 2008; Evangelista and Savona 2003). These studies confirm the complementarity between ICT and skilled labour and the substitution effect ICT has for unskilled workers. The net result of this relation for employment as a whole depends on the relative weight of skilled and unskilled workers over the total labour force in any given country at any given time. In general, access and ability to use technology as either individuals or networks affects employability, since it affects both the decision to enter the labour market (the labour participation decision), the likelihood of obtaining job offers that are later accepted (the transition from unemployment to employment) and the likelihood of remaining attached to the labour market once in (postponement of retirement effect).

Coming now to studies that have used data on older workers’ careers, Friedberg (2003) and Biagi et al. (2007) have documented how ICT skills and ICT use on the job tend to be associated with a significantly higher likelihood to remain active in the labour market. Similar findings have also been presented for Germany (Schleife 2006). Notice that these studies do not provide a homogeneous value for the increase in employability associated to the use of ICT on the job. In some cases the increase in employability is only marginal (Schleife), while in others is more accentuated (as in the study by Friedberg). Moreover, these studies are often based on the experience of non-disabled males in the age interval 45-55, so that generalizing them to the whole age distribution of disabled people is not immediately possible. We have decided to consider a lower bound value (2%), an upper bound value (10%) and an intermediate value in order to replicate the variability found in such studies. The underlying assumption, in all cases, is that disabled people would benefit from improved web accessibility because they would 1) have easier access to labour market recruitment in a non-discriminatory fashion; 2) fully benefit from the use of ICT on the job, hence increasing their productivity and employability.

* 1. User level benefits
     1. Employment

For employment we proceeded as follows. For each age group in each country for the total target of individuals aged 15-64 defined in the Annex (see Table 32) we sum up the number of individuals who report being restricted by some form of disability (distinguishing between those that are strongly and those that are only mildly restricted). Then we apply to this number the values for the employment rate as reported in LFS for the relevant age group (which also depends upon the degree of restriction implied by the disability: considerably vs. mildly restricted), so that we are able to estimate the appropriate employment rate for the relevant age and restriction group for each country. Then we compute counterfactual employment rates. This means what would be the employment rate for PwD should they become able to access web sites as much as the rest of the population and acquire the same ICT skills that increase their chances of being employed. Here we consider three different scenarios for the impact of the policy variable (improvement in web accessibility) on people with disabilities´ employability:

* **Scenario 1**. In scenario 1 we assume that the impact of Improved Web Accessibility (henceforth IWA) on employment is such that –for each age and severity group- it increases employment rates by 2%. This number is taken (as a lower bound) from studies that have been looking at the impact of ICT use on the employment rate of mature and older workers (see discussion in §5.2 above). We use this number since there is no direct evidence of the impact of IWA on employability of PwD. These counterfactual employment rates are then multiplied – for each age and restriction group- by the number of individual belonging to the group, so as to extrapolate the total employment for the group under the assumption of 2% increase as a result of IWA. This is done always for each country separately.
* **Scenario 2**. In scenario 2 we assume that –for each age group and degree of restriction- IWA reduces by half the distance between the (age and degree of restriction specific) employment rate of those reporting a LSHPD and those that do not report such situation. Notice that here –a part from age group- we still distinguish by degree of LSHPD, so that this effect generates different counterfactual employment rates (within the same age group) for those that are considerably restricted and those that are only mildly restricted. So for instance, if –for the 25-49 age group- the employment rate for those that are not restricted in Belgium in 0.814, while it is 0.699 for those who report considerable restrictions and 0,711 for those who report only a mild restriction, the effect of IWA in this scenario is to reduce the gap for those who are considerably restricted by 50% (relative to those who are not restricted at all) hence giving a counterfactual value of 0.699+0.5\*(0.814-0.699). A similar procedure is applied to those that are only mildly restricted (in which case the new employment rate would be 0.711+0.5\*(0.814-0.711). A part for the different assumption concerning the effect of IWA, when extrapolating the counterfactual employment rate, we proceed as in the previous case.
* **Scenario 3**. Finally we consider also scenario 3, where IWA has the effect of shifting up the employment rates of both considerably and mildly restricted individuals by 10%. This can be thought of as an upper bound, given that some studies document that ICT can have such a large impact on the employment rate for adult males. Then, for the counterfactual extrapolation exercise, we proceed as in the previous case.

Once we have the counterfactual employment rates under the different hypotheses on the impact of the policy variable on the employment rates of people with disabilities suffering from a strong or mild restriction, we make assumptions about the share of the target population that will actually be reached the policy change (under each scenario). In our study we consider four different cases: 1) only 5% of the target population is reached; 2) 25% is reached; 3) 50% is reached; 4) 100% is reached[[148]](#footnote-148). Once we have the counterfactual values for the employment rates under each scenario for policy impact and share of target population reached, we compute the change relative to the status quo (i.e. the initial situation), hence generating the total values in volume for the gains in employment under each hypothesis. Finally, applying Eurostat statistics on minimum and average wage level, we provide an economic value to these changes, by assuming that each additional person with disabilities employed obtains the minimum wage. This corresponds to the summary results reported in Section 7 for this key aspect.

* + 1. Wages

For wages we proceed in a slightly different way than for employment (but the logic of the exercise is very close to the one for employment). First, from the 2002 ad hoc module of the LFS we take the ratio of the wage of those who report being restricted by a disability (severe or mild) to that of those who do not report being restricted.

Table 49: Ratio of wages for restricted individuals compared to wages of non-restricted

| **Country** | **Considerably restricted (16-39)** | **To some extent restricted**  **(16-39)** | **Considerably restricted**  **(40-54)** | **To some extent restricted**  **(40-54)** | **Considerably restricted**  **(55-64)** | **To some extent restricted**  **(55-64)** |
| --- | --- | --- | --- | --- | --- | --- |
| **BE** | 0,72 | 0,78 | 0,89 | 0,95 | 0,83 | 0,91 |
| **CZ** | 0,73 | 0,77 | 0,89 | 0,95 | 0,83 | 0,91 |
| **DK** | 0,84 | 0,84 | 0,88 | 0,88 | 0,99 | 0,91 |
| **DE** | 0,73 | 0,77 | 0,89 | 0,95 | 0,83 | 0,91 |
| **EE** | 0,76 | 0,84 | 0,54 | 0,80 | 0,47 | 0,76 |
| **IE** | 0,45 | 0,70 | 0,63 | 0,82 | 0,67 | 0,94 |
| **EL** | 0,78 | 0,83 | 0,89 | 0,95 | 0,83 | 0,91 |
| **ES** | 0,76 | 0,79 | 0,89 | 0,95 | 0,83 | 0,91 |
| **FR** | 0,79 | 0,74 | 0,89 | 0,91 | 0,75 | 0,85 |
| **IT** | 0,82 | 0,82 | 0,91 | 0,97 | 0,93 | 0,93 |
| **CY** | 0,73 | 0,77 | 0,89 | 0,95 | 0,83 | 0,91 |
| **LT** | 0,73 | 0,77 | 0,89 | 0,95 | 0,83 | 0,91 |
| **LU** | 0,77 | 0,69 | 0,83 | 0,92 | 0,83 | 0,91 |
| **HU** | 0,73 | 0,77 | 0,89 | 0,95 | 0,83 | 0,91 |
| **MT** | 0,73 | 0,77 | 0,89 | 0,95 | 0,83 | 0,91 |
| **NL** | 0,73 | 0,77 | 0,89 | 0,95 | 0,83 | 0,91 |
| **AT** | 0,58 | 0,86 | 0,84 | 0,94 | 0,75 | 0,73 |
| **PT** | 0,78 | 0,72 | 0,96 | 0,99 | 0,85 | 0,71 |
| **SI** | 0,73 | 0,77 | 0,89 | 0,95 | 0,83 | 0,91 |
| **SK** | 0,73 | 0,77 | 0,89 | 0,95 | 0,83 | 0,91 |
| **FI** | 0,88 | 0,86 | 0,89 | 0,95 | 0,83 | 0,91 |
| **SE** | 0,43 | 0,66 | 0,47 | 0,86 | 0,51 | 0,82 |
| **UK** | 0,73 | 0,77 | 0,89 | 0,95 | 0,83 | 0,91 |
| **RO** | 0,73 | 0,77 | 0,89 | 0,95 | 0,83 | 0,91 |
| **NO** | 0,59 | 0,73 | 0,75 | 0,86 | 0,86 | 0,71 |
| **EU** | 0,73 | 0,77 | 0,89 | 0,95 | 0,83 | 0,91 |

Source: LFS 2002

For instance, we have that in Belgium, for the youngest age group, the wage of those reporting a strong restriction (due to a LSHPD) is 71.7% of the wage reported by someone with no restriction (the value equals 77.7% for those reporting a mild restriction, relative to those reporting no restriction whatsoever). Notice that these data are coming from the EU-SILC dataset and not from the LFS. This means that we have info only for 13 countries. For the countries not covered by EU-SILC we use the average EU13 values for relative wages (they are specific to both age group and degree of restriction).

Once we have the value for the relative wages for each age-group (and degree of restriction), we can estimate wages for PwD by applying the reported relative wages to the age-specific monthly wages of the rest of the population. We take these from the Structure of Earnings Survey of 2006.

Table 50: Gross monthly wages by age groups

| **Country** | **less than 30** | **30-39** | **40-49** | **50-59** |
| --- | --- | --- | --- | --- |
| **BE** | 2240 | 2777 | 3043 | 3306 |
| **CZ** | 640 | 776 | 755 | 726 |
| **DK** | 2280 | 3489 | 3750 | 3684 |
| **DE** | 1815 | 2915 | 3039 | 3165 |
| **EE** | 634 | 726 | 629 | 567 |
| **IE** | 2528 | 3574 | 3818 | 3875 |
| **EL** | 1129 | 1535 | 1884 | 2187 |
| **ES** | 1332 | 1687 | 1857 | 2038 |
| **FR** | 1860 | 2406 | 2594 | 2911 |
| **IT** | 1601 | 1964 | 2194 | 2521 |
| **CY** | 1332,75 | 1777 | 2076 | 2297 |
| **LT** | 458 | 487 | 473 | 470 |
| **LU** | 2443 | 3378 | 3730 | 4057 |
| **HU** | 543 | 651 | 633 | 662 |
| **MT** | 1101 | 1374 | 1383 | 1332 |
| **NL** | 1736 | 2832 | 3021 | 3036 |
| **AT** | 1710 | 2467 | 2684 | 2798 |
| **PT** | 831 | 1162 | 1312 | 1461 |
| **SI** | 958 | 1212 | 1247 | 1362 |
| **SK** | 482 | 562 | 533 | 531 |
| **FI** | 2147 | 2649 | 2703 | 2664 |
| **SE** | 2422 | 2903 | 3032 | 2981 |
| **UK** | 2751,75 | 3669 | 3701 | 3491 |
| **RO** | 269 | 324 | 345 | 408 |
| **NO** | 3068 | 4059 | 4355 | 4269 |
| **EU** | 1654 | 2306 | 2531 | 2735 |

Source: 2006 Structure of Earnings Survey

Notice that the LFS data (on which the computation of relative wages is based) refer to year 2002. We assume that the relative wages observed in 2002 are still valid in 2006[[149]](#footnote-149) (which seems a reasonable assumption, especially considering that we have no data on relative wages past 2002).

Once we have estimated wages for individuals with a LSHPD that imply some restrictions for the various age groups previously mentioned[[150]](#footnote-150), we make some hypotheses about the effect of the policy variable (IwA).

* **Scenario 1**. In scenario 1 we assume that half of the wage differential between those who suffer from a LSHPD and those who don’t is eliminated by IWA. So, for instance, if in Belgium –following the previous example- the relative wage for those with a strong limitation due to LSHPD is 71.7% of that of those with no restriction, the assumption here is that the new relative wage (after improved WA) is 0.717+0.5\*(1-0.717). Once we have extrapolated the new relative wage, we compute the counterfactual wage for this group (that is, we multiply the counterfactual relative wage by the observed wage according to the 2006 SES). Then we take the difference between the estimated and the extrapolated wage, to determine the impact of IWA on a given age and restrictions specific group under scenario 1.
* **Scenario 2.** In scenario 2, we proceed similarly to scenario 1, with the difference that we consider a case in which IWA has the effect of improving by 10 percentage points the value of the estimated relative wage. So, following the previous example, if the relative wage for the relevant group is 71.7, the counterfactual relative wage for this group (due to IWA) is supposed to be equal to 81.7. This scenario is consistent with the findings of Applica et al (2007), where the authors show that –when controlling for all the relevant observable characteristics (among which education plays a major role)- there exists a difference of 10 percentage points between the wage of someone who is restricted and someone who is not. This is often interpreted as a measure of discrimination, and hence our scenario 2 is consistent with the hypothesis that IWA eliminates wage discrimination[[151]](#footnote-151) (conditional on all the other individual specific characteristics, including education, which are not affected by the policy variable). Once we have extrapolated the wage for the relevant age and restriction specific groups, for each group we compare it with the estimated wage (which represents the status quo) and, hence, we obtain the gain in wages due to IWA under scenario 2.
* **Scenario 3.** In scenario 3 we assume that the entire wage differential is eliminated by IWA. For the rest we proceed as in the previous cases.

Once we have determined the potential gain under each scenario for the policy variable we consider different hypothesis concerning the percentage of the target population that is effectively affected (reached) by the policy. As for employment, we consider the following hypotheses: 1) only 5% of the target population is reached by the policy change; 2) 25% is reached; 3) 50% is reached; 4) 100% is reached. The results combining all of the above are those presented in Section 7.

* + 1. Health utility (QALY and DALY)

In this part we have tried to provide an approximate value for the increase in health related quality of life that would be generated by IWA for those suffering from a restriction originating from a LSHPD. This is based on two key concepts in health economics: Quality Adjusted Life Years (QALY) and Disability Adjusted Life Years (DALY). Below we give only a very brief illustration of these concepts.

QALY. QALYs are calculated using Health-Related Quality of Life (HRQoL) indexes, which in turn are combined subjective (survey to patients) and objective (clinical evidence) measures of health status of individuals as a relative measure of full health. So, let us assume that among a population of individuals with visual impairment we have a HRQoL index of 0.5, this means that the quality of life is half that without such impairment. If this condition can be assumed to last a year, then the average QALYs for that year of each individual in the group would be 0.5 QALYs, or seen from the opposite perspective each of them lose 0.5 of a full quality adjusted year due to the disabling impact of the impairment. If we multiply this for a hypothetical population of 10 million visually impaired individuals we get that in any given year we have a loss of 5 million QALYs. The aggregate impact of a measure reducing the burden of visual impairment for the above hypothesised target population of 10 million by 0,2 point of the HRQoL index is then the gain of 2 million QALYs per year. To more simply convey the meaning of QALY it suffices to say that full health equal 1 QALY and death equal 0 QALY. A much debated and controversial issue is that of how to give a monetary value to QALY. We have used the benchmark of €20,000 for QALY representing a reasonable weighted average from the several proposals found in the literature.

DALY. The Disability Adjusted Life Years (DALYs) approach, developed by World Bank experts such as Murray (1996) is different from that of QALYs in that the DALYs concept has been developed in order to calculate the loss in terms of years of life in full health associated with premature mortality, with being sick or from having a long-standing disability. So DALYs measures health status or outcomes in terms of losses from a normative benchmark, and in this sense differs from QALYS that measures potential gains. So the latter is more suitable to assess the impacts of an intervention, whereas the former is mostly used to assess the disease/disability burden situation.

Having clarified the above, our starting point here is represented by the values for disability weights provided by WHO.

Table 51: Disability weights

| **Disability Type** | **Moderate** | **Acute** |
| --- | --- | --- |
| **Vision** | 0,17 | 0,6 |
| **Hearing** | 0,12 | 0,33 |
| **Arm and Hands** | 0,118 | 0,147 |
| **Back, Leg or neck** | 0,185 | 0,221 |
| **Epilepsy** | 0,052 | 0,142 |
| **Cognitive** | 0,14 | 0,5 |

Source: WHO Global Burden of Disease Update, 2004

These weights represent how much a given disease or disability reduces the full quality of life (which has a standardised value of 1) and they change depending upon the type of disease or disability. So, for instance, a value of 0.147 for severe Ostheoartitis implies that such disease reduces by 14.7% the full value of life. However, disability weights change not only in relationship to the disability type but also with respect to the severity of the disability. For instance, the disability weight for a severe disability that impairs vision is 0.6, while the weight for a disability that has only a moderate effect on vision is 0.17. Hence we need to look at the distribution of prevalence of disability by type and select those that are more likely to be affected positively by IWA (that is the possibility of using website for information or services offset partially the constraining effects of disability). Notice that, for each disability, we still distinguish by degree of restriction and age classes. This implies that now we look at the percentage of those who, in a given age group (say 16-24), report suffering from a disability that considerably or moderately restrict vision. And then, separately, we also look at the percentage of those who, in the same age group, suffer from a disability that -considerably or moderately- reduces their ability to move. The relevant disability types that we have focused on -the ones on which IWA is likely to have a larger impact- are the following: a) Group 1: disabilities related to seeing, hearing and speaking; b) Group 2: disabilities related to arms, legs and back; c) Group 3: disabilities related to epilepsy and mental condition (see Table 52, Table 53 and Table 54).

For each of these types we have considered the percentage of those reporting being either considerably or mildly restricted. In other words, we do not consider those who report some disability but also declare that such disability does not restrict them in any way (related to work, given the focus of LFS). Notice that this procedure might generate an overestimation of the number of individuals reporting being restricted by some disability. This is because we might have double (or more) counting: someone reporting suffering from back problems might also suffer from hand problems. If we simply sum up the percentage of individuals reporting being restricted by a LSHPD affecting their back to those being restricted by a LSHP affecting their hands, we incur the risk of counting the same person twice. Given that it is very hard to imagine all the possible disability correlations, we have corrected this problem by imposing that the overall number of restricted people with disabilities estimated using this methodology are equal to the actual number of individuals reporting a restriction due to a disability, country by country. That is, we have weighted our estimate in such a way that, on the aggregate, our results are consistent with the aggregate statistics offered by LFS 2002 (country by country). Next we proceed as follows: for each disability type, age group and degree of restriction we compute the value for the quality of life adjusted (using the disability weights) in the remaining years of life[[152]](#footnote-152). Once we have this number, which represents the estimated “relative” (to full health) value for someone of a given age group, disability type and degree of restriction, we multiply this value for the total number of individuals satisfying the same criteria. The result represents the estimated number of QALY (in a given country) for those of a given age and suffering from a given LSHPD with a given degree of restriction.

Note that in the tables below, “Seeing, Hearing and Speech” is referred to as “Group 1”, “Arms Legs and Back” is referred to “Group 2” and “Epilepsy and Mental” is referred to as “Group 3”.

Table 52: Distribution of restriction by disability types (age class 16-24)

| **Country** | **Seeing** | **Hearing** | **Speech** | **Considerably restricted** | **To some extent restricted** |
| --- | --- | --- | --- | --- | --- |
| **BE** | 0,081 | 0,038 | 0,022 | 0,109 | 0,309 |
| **CZ** | 0,083 | 0,015 | 0,006 | 0,058 | 0,408 |
| **DK** | 0,024 | 0,011 | 0 | 0,05 | 0,447 |
| **DE** | 0,07 | 0,03 | 0,01 | 0,13 | 0,29 |
| **EE** | 0,056 | 0,049 | 0 | 0,154 | 0,173 |
| **IE** | 0,021 | 0,031 | 0,009 | 0,199 | 0,242 |
| **EL** | 0,178 | 0,031 | 0,025 | 0,099 | 0,2 |
| **ES** | 0,037 | 0,026 | 0,004 | 0,175 | 0,384 |
| **FR** | 0,165 | 0,029 | 0,017 | 0,302 | 0 |
| **IT** | 0,032 | 0,037 | 0,016 | 0,159 | 0,471 |
| **CY** | 0,022 | 0,022 | 0 | 0 | 1 |
| **LT** | 0,074 | 0,011 | 0,021 | 0,165 | 0,835 |
| **LU** | 0,194 | 0,057 | 0 | 0,205 | 0,035 |
| **HU** | 0,01 | 0,024 | 0,041 | 0,648 | 0,352 |
| **MT** | 0 | 0 | 0 | 1 | 0 |
| **NL** | 0,032 | 0,029 | 0 | 0,061 | 0,121 |
| **AT** | 0,079 | 0,027 | 0,012 | 0,103 | 0,281 |
| **PT** | 0,093 | 0,02 | 0,016 | 0,083 | 0,3 |
| **SI** | 0,038 | 0,009 | 0 | 0,535 | 0,249 |
| **SK** | 0,043 | 0,043 | 0,017 | 0,627 | 0,241 |
| **FI** | 0,016 | 0,011 | 0,001 | 0,089 | 0,435 |
| **SE** | 0,027 | 0,042 | 0 | 0,105 | 0,143 |
| **UK** | 0,021 | 0,031 | 0,002 | 0,143 | 0,254 |
| **RO** | 0,031 | 0,012 | 0,008 | 0,54 | 0,46 |
| **NO** | 0,125 | 0,048 | 0,004 | 0,42 | 0,573 |
| **EU** | 0,07 | 0,029 | 0,008 | 0,125 | 0,294 |

Source: LFS 2002 and EU-SILC

Table 52 cont.: Distribution of restriction by disability types (age class 16-24)

| **Country** | **Arms** | **Legs** | **Back** | **Considerably restricted** | **To some extent restricted** |
| --- | --- | --- | --- | --- | --- |
| **BE** | 0,014 | 0,085 | 0,121 | 0,261 | 0,451 |
| **CZ** | 0,022 | 0,099 | 0,09 | 0,219 | 0,393 |
| **DK** | 0,022 | 0,091 | 0,155 | 0,155 | 0,443 |
| **DE** | 0,034 | 0,081 | 0,102 | 0,315 | 0,332 |
| **EE** | 0,025 | 0,06 | 0,038 | 0,35 | 0,098 |
| **IE** | 0,027 | 0,035 | 0,061 | 0,505 | 0,318 |
| **EL** | 0,016 | 0,084 | 0,013 | 0,499 | 0,312 |
| **ES** | 0,041 | 0,103 | 0,096 | 0,472 | 0,307 |
| **FR** | 0,031 | 0,084 | 0,144 | 0,537 | 0 |
| **IT** | 0,067 | 0,145 | 0,055 | 0,401 | 0,329 |
| **CY** | 0,08 | 0,081 | 0,129 | 0,29 | 0,452 |
| **LT** | 0,109 | 0,205 | 0,168 | 0,901 | 0,068 |
| **LU** | 0 | 0,196 | 0,091 | 0,263 | 0,44 |
| **HU** | 0,027 | 0,121 | 0,03 | 0,861 | 0,139 |
| **MT** | 0 | 0 | 0 | 0,838 | 0,162 |
| **NL** | 0,052 | 0,092 | 0,12 | 0,252 | 0,343 |
| **AT** | 0,061 | 0,154 | 0,104 | 0,205 | 0,328 |
| **PT** | 0,036 | 0,071 | 0,091 | 0,255 | 0,47 |
| **SI** | 0,03 | 0,053 | 0,201 | 0,448 | 0,304 |
| **SK** | 0,018 | 0,07 | 0,13 | 0,654 | 0,212 |
| **FI** | 0,038 | 0,064 | 0,086 | 0,116 | 0,53 |
| **SE** | 0,051 | 0,089 | 0,198 | 0,157 | 0,485 |
| **UK** | 0,028 | 0,06 | 0,063 | 0,35 | 0,239 |
| **RO** | 0,04 | 0,011 | 0 | 0,803 | 0,197 |
| **NO** | 0,074 | 0,043 | 0,158 | 0,834 | 0,166 |
| **EU** | 0,034 | 0,081 | 0,102 | 0,315 | 0,332 |

Source: LFS 2002 and EU-SILC **Table 52 cont.: Distribution of restriction by disability types (age class 16-24)**

| **Country** | **Epilepsy** | **Mental** | **Considerably restricted** | **To some extent restricted** |
| --- | --- | --- | --- | --- |
| **BE** | 0,031 | 0,04 | 0,542 | 0,229 |
| **CZ** | 0,028 | 0,066 | 0,618 | 0,262 |
| **DK** | 0,043 | 0,111 | 0,381 | 0,216 |
| **DE** | 0,024 | 0,121 | 0,609 | 0,199 |
| **EE** | 0 | 0,162 | 0,678 | 0,111 |
| **IE** | 0,046 | 0,102 | 0,675 | 0,108 |
| **EL** | 0,027 | 0,206 | 0,698 | 0,255 |
| **ES** | 0,027 | 0,242 | 0,65 | 0,224 |
| **FR** | 0,011 | 0,092 | 0,665 | 0 |
| **IT** | 0,017 | 0,182 | 0,709 | 0,138 |
| **CY** | 0 | 0,267 | 0,797 | 0,203 |
| **LT** | 0 | 0,174 | 0,912 | 0,088 |
| **LU** | 0 | 0,109 | 0,701 | 0,091 |
| **HU** | 0,083 | 0,322 | 0,859 | 0,084 |
| **MT** | 0 | 0 | 0,767 | 0,233 |
| **NL** | 0,027 | 0,092 | 0,377 | 0,115 |
| **AT** | 0,032 | 0,078 | 0,428 | 0,447 |
| **PT** | 0,037 | 0,16 | 0,446 | 0,358 |
| **SI** | 0,03 | 0,088 | 0,7 | 0,191 |
| **SK** | 0,073 | 0,293 | 0,91 | 0,09 |
| **FI** | 0,023 | 0,069 | 0,322 | 0,47 |
| **SE** | 0,017 | 0,064 | 0,227 | 0,453 |
| **UK** | 0,029 | 0,137 | 0,646 | 0,164 |
| **RO** | 0,14 | 0,477 | 0,782 | 0,2 |
| **NO** | 0,011 | 0,282 | 0,579 | 0,421 |
| **EU** | 0,024 | 0,121 | 0,609 | 0,199 |

Source: LFS 2002 and EU-SILC

Table **53**: Distribution of restriction by disability types (age class 25-49)

| **Country** | **Seeing** | **Hearing** | **Speech** | **Considerably restricted** | **To some extent restricted** |
| --- | --- | --- | --- | --- | --- |
| **BE** | 0,046 | 0,01 | 0,007 | 0,142 | 0,259 |
| **CZ** | 0,064 | 0,01 | 0,005 | 0,112 | 0,299 |
| **DK** | 0,023 | 0,019 | 0,005 | 0,29 | 0,129 |
| **DE** | 0,047 | 0,021 | 0,004 | 0,23 | 0,243 |
| **EE** | 0,07 | 0,018 | 0,015 | 0,071 | 0,247 |
| **IE** | 0,017 | 0,022 | 0,005 | 0,327 | 0,253 |
| **EL** | 0,061 | 0,01 | 0,005 | 0,141 | 0,284 |
| **ES** | 0,036 | 0,02 | 0,006 | 0,416 | 0,251 |
| **FR** | 0,098 | 0,024 | 0,005 | 0,288 | 0 |
| **IT** | 0,043 | 0,019 | 0,009 | 0,284 | 0,299 |
| **CY** | 0,044 | 0,011 | 0 | 0,266 | 0,435 |
| **LT** | 0,017 | 0,018 | 0,007 | 0,411 | 0,418 |
| **LU** | 0,055 | 0,004 | 0,002 | 0,097 | 0,029 |
| **HU** | 0,02 | 0,012 | 0,003 | 0,83 | 0,147 |
| **MT** | 0,015 | 0,01 | 0 | 0,133 | 0,363 |
| **NL** | 0,019 | 0,019 | 0,006 | 0,165 | 0,161 |
| **AT** | 0,032 | 0,028 | 0,006 | 0,153 | 0,319 |
| **PT** | 0,058 | 0,014 | 0,007 | 0,212 | 0,194 |
| **SI** | 0,034 | 0,016 | 0 | 0,42 | 0,358 |
| **SK** | 0,03 | 0,013 | 0,009 | 0,43 | 0,504 |
| **FI** | 0,015 | 0,011 | 0,002 | 0,194 | 0,355 |
| **SE** | 0,015 | 0,03 | 0,001 | 0,068 | 0,244 |
| **UK** | 0,015 | 0,024 | 0,001 | 0,23 | 0,197 |
| **RO** | 0,029 | 0,012 | 0,013 | 0,448 | 0,406 |
| **NO** | 0,036 | 0,039 | 0,003 | 0,577 | 0,423 |
| **EU** | 0,047 | 0,021 | 0,004 | 0,23 | 0,243 |

**Source: LFS 2002 and EU-SILC**  
Table 53 cont.: Distribution of restriction by disability types (age class 25-49)

| **Country** | **Arms** | **Legs** | **Back** | **Considerably restricted** | **To some extent restricted** |
| --- | --- | --- | --- | --- | --- |
| **BE** | 0,059 | 0,093 | 0,289 | 0,24 | 0,521 |
| **CZ** | 0,047 | 0,115 | 0,212 | 0,269 | 0,5 |
| **DK** | 0,068 | 0,112 | 0,304 | 0,571 | 0,25 |
| **DE** | 0,065 | 0,104 | 0,212 | 0,422 | 0,324 |
| **EE** | 0,088 | 0,128 | 0,185 | 0,184 | 0,247 |
| **IE** | 0,047 | 0,065 | 0,162 | 0,534 | 0,306 |
| **EL** | 0,037 | 0,113 | 0,095 | 0,295 | 0,457 |
| **ES** | 0,057 | 0,115 | 0,186 | 0,516 | 0,332 |
| **FR** | 0,071 | 0,099 | 0,236 | 0,615 | 0 |
| **IT** | 0,078 | 0,127 | 0,181 | 0,353 | 0,431 |
| **CY** | 0,043 | 0,1 | 0,256 | 0,318 | 0,538 |
| **LT** | 0,018 | 0,09 | 0,099 | 0,66 | 0,068 |
| **LU** | 0,09 | 0,121 | 0,325 | 0,248 | 0,44 |
| **HU** | 0,02 | 0,175 | 0,114 | 0,946 | 0,139 |
| **MT** | 0,078 | 0,081 | 0,215 | 0,564 | 0,162 |
| **NL** | 0,11 | 0,1 | 0,278 | 0,364 | 0,343 |
| **AT** | 0,079 | 0,159 | 0,289 | 0,168 | 0,328 |
| **PT** | 0,054 | 0,107 | 0,204 | 0,364 | 0,47 |
| **SI** | 0,053 | 0,095 | 0,303 | 0,535 | 0,304 |
| **SK** | 0,04 | 0,137 | 0,218 | 0,564 | 0,212 |
| **FI** | 0,082 | 0,08 | 0,172 | 0,304 | 0,53 |
| **SE** | 0,086 | 0,081 | 0,269 | 0,322 | 0,485 |
| **UK** | 0,053 | 0,096 | 0,174 | 0,5 | 0,239 |
| **RO** | 0,048 | 0,113 | 0,079 | 0,434 | 0,197 |
| **NO** | 0,188 | 0,102 | 0,251 | 0,935 | 0,166 |
| **EU** | 0,065 | 0,104 | 0,212 | 0,422 | 0,332 |

Source: LFS 2002 and EU-SILC

Table 53 cont.: Distribution of restriction by disability types (age class 25-49)

| **Country** | **Epilepsy** | **Mental** | **Considerably restricted** | **To some extent restricted** |
| --- | --- | --- | --- | --- |
| **BE** | 0,009 | 0,09 | 0,256 | 0,467 |
| **CZ** | 0,012 | 0,048 | 0,658 | 0,198 |
| **DK** | 0,013 | 0,097 | 0,674 | 0,162 |
| **DE** | 0,013 | 0,111 | 0,627 | 0,183 |
| **EE** | 0,018 | 0,059 | 0,449 | 0,101 |
| **IE** | 0,025 | 0,13 | 0,697 | 0,176 |
| **EL** | 0,007 | 0,139 | 0,611 | 0,268 |
| **ES** | 0,013 | 0,199 | 0,741 | 0,153 |
| **FR** | 0,007 | 0,102 | 0,702 | 0 |
| **IT** | 0,01 | 0,129 | 0,634 | 0,213 |
| **CY** | 0,01 | 0,124 | 0,764 | 0,16 |
| **LT** | 0,029 | 0,203 | 0,807 | 0,115 |
| **LU** | 0,014 | 0,048 | 0,577 | 0,251 |
| **HU** | 0,01 | 0,172 | 0,89 | 0,085 |
| **MT** | 0 | 0,145 | 0,606 | 0,186 |
| **NL** | 0,012 | 0,122 | 0,44 | 0,144 |
| **AT** | 0,01 | 0,062 | 0,458 | 0,371 |
| **PT** | 0,016 | 0,166 | 0,467 | 0,363 |
| **SI** | 0,009 | 0,066 | 0,771 | 0,167 |
| **SK** | 0,022 | 0,111 | 0,766 | 0,204 |
| **FI** | 0,01 | 0,065 | 0,502 | 0,287 |
| **SE** | 0,009 | 0,102 | 0,378 | 0,235 |
| **UK** | 0,022 | 0,099 | 0,69 | 0,128 |
| **RO** | 0,015 | 0,115 | 0,615 | 0,291 |
| **NO** | 0,015 | 0,126 | 0,883 | 0,117 |
| **EU** | 0,013 | 0,111 | 0,627 | 0,183 |

Source: LFS 2002 and EU-SILC

Table 54: Distribution of restriction by disability types (age class 50-65)

| **Country** | **Seeing** | **Hearing** | **Speech** | **Considerably restricted** | **To some extent restricted** |
| --- | --- | --- | --- | --- | --- |
| BE | 0,048 | 0,022 | 0,003 | 0,115 | 0,241 |
| CZ | 0,053 | 0,014 | 0,003 | 0,127 | 0,32 |
| DK | 0,017 | 0,018 | 0,004 | 0,402 | 0,163 |
| DE | 0,035 | 0,019 | 0,002 | 0,341 | 0,218 |
| EE | 0,071 | 0,007 | 0,002 | 0,147 | 0,055 |
| IE | 0,015 | 0,013 | 0,002 | 0,504 | 0,201 |
| EL | 0,03 | 0,008 | 0,004 | 0,213 | 0,339 |
| ES | 0,033 | 0,011 | 0,004 | 0,585 | 0,193 |
| FR | 0,071 | 0,028 | 0,001 | 0,398 | 0 |
| IT | 0,026 | 0,013 | 0,005 | 0,38 | 0,358 |
| CY | 0,02 | 0,011 | 0,005 | 0,514 | 0,419 |
| LT | 0,027 | 0,025 | 0 | 0,546 | 0,168 |
| LU | 0,046 | 0,025 | 0 | 0,02 | 0,149 |
| HU | 0,015 | 0,006 | 0,003 | 0,877 | 0,071 |
| MT | 0,046 | 0 | 0 | 0,757 | 0 |
| NL | 0,023 | 0,017 | 0,004 | 0,294 | 0,069 |
| AT | 0,027 | 0,02 | 0,008 | 0,369 | 0,304 |
| PT | 0,041 | 0,012 | 0,004 | 0,388 | 0,316 |
| SI | 0,032 | 0,006 | 0 | 0,376 | 0,313 |
| SK | 0,016 | 0,014 | 0,003 | 0,499 | 0,403 |
| FI | 0,012 | 0,009 | 0 | 0,343 | 0,315 |
| SE | 0,023 | 0,049 | 0,001 | 0,142 | 0,177 |
| UK | 0,019 | 0,022 | 0,001 | 0,329 | 0,153 |
| RO | 0,029 | 0,008 | 0,003 | 0,56 | 0,204 |
| NO | 0,029 | 0,033 | 0,003 | 0,806 | 0,194 |
| EU | 0,035 | 0,019 | 0,002 | 0,341 | 0,218 |

Source: LFS 2002 and EU-SILCTable 54 cont.: Distribution of restriction by disability types (age class 50-65)

| **Country** | **Arms** | **Legs** | **Back** | **Considerably restricted** | **To some extent restricted** |
| --- | --- | --- | --- | --- | --- |
| BE | 0,058 | 0,101 | 0,281 | 0,29 | 0,539 |
| CZ | 0,047 | 0,167 | 0,158 | 0,26 | 0,556 |
| DK | 0,081 | 0,088 | 0,266 | 0,656 | 0,186 |
| DE | 0,071 | 0,143 | 0,182 | 0,528 | 0,279 |
| EE | 0,052 | 0,145 | 0,152 | 0,309 | 0,318 |
| IE | 0,08 | 0,116 | 0,131 | 0,544 | 0,266 |
| EL | 0,027 | 0,119 | 0,074 | 0,298 | 0,44 |
| ES | 0,074 | 0,168 | 0,229 | 0,671 | 0,245 |
| FR | 0,08 | 0,129 | 0,172 | 0,778 | 0 |
| IT | 0,083 | 0,149 | 0,163 | 0,447 | 0,39 |
| CY | 0,061 | 0,132 | 0,162 | 0,308 | 0,632 |
| LT | 0,005 | 0,098 | 0,077 | 0,719 | 0,269 |
| LU | 0,113 | 0,156 | 0,314 | 0,317 | 0,191 |
| HU | 0,013 | 0,191 | 0,116 | 0,946 | 0,049 |
| MT | 0,075 | 0,12 | 0,179 | 0,446 | 0,317 |
| NL | 0,107 | 0,133 | 0,269 | 0,497 | 0,148 |
| AT | 0,058 | 0,172 | 0,255 | 0,277 | 0,508 |
| PT | 0,068 | 0,182 | 0,218 | 0,501 | 0,411 |
| SI | 0,04 | 0,144 | 0,216 | 0,633 | 0,337 |
| SK | 0,031 | 0,177 | 0,218 | 0,6 | 0,39 |
| FI | 0,087 | 0,12 | 0,143 | 0,544 | 0,381 |
| SE | 0,108 | 0,107 | 0,23 | 0,418 | 0,307 |
| UK | 0,067 | 0,147 | 0,159 | 0,592 | 0,152 |
| RO | 0,053 | 0,133 | 0,034 | 0,426 | 0,408 |
| NO | 0,239 | 0,142 | 0,217 | 0,965 | 0,035 |
| EU | 0,071 | 0,143 | 0,182 | 0,528 | 0,279 |

Source: LFS 2002 and EU-SILCTable 54 cont.: Distribution of restriction by disability types (age class 50-65)

| **Country** | **Epilepsy** | **Mental** | **Considerably restricted** | **To some extent restricted** |
| --- | --- | --- | --- | --- |
| BE | 0,005 | 0,038 | 0,469 | 0,226 |
| CZ | 0,006 | 0,021 | 0,537 | 0,301 |
| DK | 0,01 | 0,067 | 0,597 | 0,266 |
| DE | 0,005 | 0,052 | 0,638 | 0,184 |
| EE | 0 | 0,021 | 0,214 | 0,476 |
| IE | 0,009 | 0,06 | 0,707 | 0,105 |
| EL | 0,005 | 0,043 | 0,542 | 0,386 |
| ES | 0,005 | 0,065 | 0,701 | 0,188 |
| FR | 0,003 | 0,061 | 0,853 | 0 |
| IT | 0,004 | 0,058 | 0,622 | 0,229 |
| CY | 0,008 | 0,051 | 0,59 | 0,347 |
| LT | 0,01 | 0,065 | 0,569 | 0,33 |
| LU | 0,004 | 0,018 | 0,407 | 0,593 |
| HU | 0,006 | 0,07 | 0,914 | 0,058 |
| MT | 0 | 0,113 | 0,665 | 0,158 |
| NL | 0,006 | 0,066 | 0,416 | 0,079 |
| AT | 0,003 | 0,03 | 0,447 | 0,362 |
| PT | 0,009 | 0,072 | 0,469 | 0,349 |
| SI | 0,002 | 0,025 | 0,617 | 0,383 |
| SK | 0,005 | 0,026 | 0,762 | 0,238 |
| FI | 0,004 | 0,029 | 0,655 | 0,224 |
| SE | 0,005 | 0,041 | 0,482 | 0,138 |
| UK | 0,006 | 0,047 | 0,77 | 0,085 |
| RO | 0,004 | 0,034 | 0,405 | 0,569 |
| NO | 0,004 | 0,063 | 0,965 | 0,035 |
| EU | 0,005 | 0,052 | 0,638 | 0,184 |

Source: LFS 2002 and EU-SILC

If we aggregate these numbers across the various age groups, disability types and degrees of restriction we obtain the country-specific estimated aggregate number of QALY.

In this case we do not make assumptions about the impact of the policy variable, as policy cannot directly affect the complex interaction between using the web and how this improves health related quality of life. We make, instead, hypothesis about the impact of IWA on the quality of life of people suffering from a LSHPD in general. In fact, we assume that IWA has an impact on the disability weights. Yet, we still make three scenarios about this assumption.

In scenario 1 we assume that IWA reduces disability weights by 1%, in scenario 2 we assume that it reduces them by 5% and in scenario 3 we consider a 10% reduction. Then, under each scenario, for each country, we compute the counterfactual number of QALYs for each representative group and then we multiply this number by the size of the group. By doing this we are able to estimate the counterfactual aggregate number of QALYs generated for a given country in a given scenario. Finally, we take the difference between the counterfactual and the estimated QALY and we multiply this value by an estimate of the economic value of a full QALY (that is of a year lived in full health: we have taken a value of €20,000). This final number represents an approximation to the change in value of life for those suffering from a given disease, in a given age group and with a given degree of restriction, induced by improved WA.

As in previous cases we make different hypotheses concerning the percentage of the target population that is effectively affected (reached) by the IWA, and consider the following hypotheses: 1) only 5% of the target population is reached by the policy change; 2) 25% is reached; 3) 50% is reached; 4) 100% is reached. The results combining all of the above are those presented in Section 7.

* + 1. eCommerce and eBanking

The assumption is that IWA will enable more PwD to take advantage of the lower prices for the same products offered in traditional retail outlets that can be obtained from eCommerce. Here, we faced a main bottleneck in that reliable data on how much eCommerce consumers save from a common basket of goods (compared to traditional retail) exist only for the UK: on average an overall saving for consumers using eCommerce of roughly €358).

In order to produce this same baseline value for all other EU countries we have weighted the UK value using the Eurostat 2009 Survey providing us data on the percentage of enterprise turn-over that they gain from eCommerce. We compared for each country[[153]](#footnote-153) this percentage to that of the UK and then apply a weight (higher or lower) to the initial €358. The idea is that in countries where –relative to the UK- eCommerce is less developed, the gains from switching from traditional to ecommerce are relatively lower (for instance because of reduced availability of products and reduced competition, which implies higher prices for goods and services bought through the Internet).

Once we have obtained such country-specific weights, we multiply them by the country-specific number of potential beneficiaries. To compute such number we start from the identification of the (potential) target population. In order to do this we start by comparing Internet usage among PwD compared to the rest of the population for the only year for which this is available: 2002 through the earlier mentioned Eurobarometer survey. This comparison yields a 12% gap that we carry through the rest of the analysis. Indeed we make the assumption that the potential target of PwD who can start using eCommerce is 12% of people with a restriction arising from a LSHPD (i.e. we are assuming that –potentially- WA is able to close the gap in the use of Internet between people with and without disabilities)[[154]](#footnote-154). For gains arising from increased usage of Internet Banking we follow the same exact procedure as for eCommerce, with the difference that: a) the gain per person switching is €100 (an upgrade of the €93 estimate reported in **¡Error! No se encuentra el origen de la referencia.**); b) The gap in the usage of Internet Banking between people with and without disabilities is 13 percentage points[[155]](#footnote-155).

As in previous cases we make different hypotheses concerning the percentage of the target population that is effectively affected (reached) by the IWA, and consider the following hypotheses: 1) only 5% of the target population is reached by the policy change; 2) 25% is reached; 3) 50% is reached; 4) 100% is reached. The results combining all of the above are those presented in Section 7.

* + 1. eGovernment

We also consider the gains arising from the fact that –because of improved WA- some individuals that find themselves restricted by a LSHPD, might be able to switch from traditional Government services to eGovernment. From a study reported in **¡Error! No se encuentra el origen de la referencia.** we know that on average in EU27 such switch can originate a time saving of about 69 minutes. To assign a value to this saved time we assume that for those who are in the age interval 16-65 the opportunity cost of saved time is given by the average hourly wage, while for those past age 65 it is equal to the hourly minimum wage[[156]](#footnote-156). We use the same 12% gap identified earlier and apply it to obtain the estimated number of PwD that would benefit from IWA (i.e. in each country we assume that WA has the effect to close the gap between people with and without disabilities in the use of Internet for eGovernment practices). This represents our potential target population.

As in previous cases we make different hypotheses concerning the percentage of the target population that is effectively affected (reached) by the IWA, and consider the following hypotheses: 1) only 5% of the target population is reached by the policy change; 2) 25% is reached; 3) 50% is reached; 4) 100% is reached. The results combining all of the above are those presented in Section 7.

* 1. Organisational level benefits
     1. Premise

Organisations reached through FLE questionnaire and CS activities are generally aware about the benefits and costs of IWA but do not have the measurement readiness capacity to quantify them in systematic ways. Therefore, from our research it has arisen a need for capacity building activities (that the European Commission should support), in order to improve measurement capabilities in the web accessibility field.

For our short-term purpose of providing aggregate projections of organisational level benefit this has meant that, contrary to what we had foreseen in our Technical Offer, we had to slightly deviates from the extrapolation procedure and apply instead by analogy the same estimation procedure used for quantification of users’ level benefits. More specifically, for efficiency gains (public sector) and eCommerce gains (private sector) we applied the same estimation methodology used for the earlier seen users’ level benefits, naturally changing appropriately the baseline statistics and related parameters. This approach was not feasible to calculate potential gains from increased productivity for employers due to IWA for the simple reasons that there are not reliable statistics on the average number of employees with disabilities being employed in EU27 by enterprises of different sectors and size. Using the data we have to generate such granular country-by-country statistics would have meant to venture in totally unreliable and back of the envelope exercises.

* + 1. Efficiency gains for the public sector

As usual, the first task is the identification of the target population. We are consistent with what we have assumed when computing gains for people with disabilities switching to eGovernment (see section on Users’ benefits from eGovernment), so we hypothesize that –in each country- the policy closes the gap between people with and without disabilities in the use of Internet for interactions with the public sector. This projection is the other side of the coin of the one conducted for the users. The difference being that users save their ‘free’ time, whereas public administration need less labour input for services that is entirely delivered and handled electronic.

To quantify the latter we have to make assumptions about the costs saved by the Government for every service that is offered on line as opposed to traditional service. From a study by Fresh Mind (2008) we know, that on average, for every switch from traditional services to eGovernment there is a saving of €18.22 for the public sector. If we assume that, on average, each individual of the target population uses 3 services per year, we are able to compute the total saving per person per year and aggregate them by country. Note that we use the same data as per Table 18 for the total pool of affected individuals but we multiply them by €18.58 and by 3 times per year (instead of by 69 minutes and minimum hourly wage).

As in previous cases we make different hypotheses concerning the percentage of the target population that is effectively affected (reached) by the IWA, and consider the following hypotheses: 1) only 5% of the target population is reached by the policy change; 2) 25% is reached; 3) 50% is reached; 4) 100% is reached. The results combining all of the above are those presented in Section 7.

* + 1. eCommerce gains

As earlier mentioned, we originally planned to obtain information on private sector organisations benefits arising from IWA with the questionnaire of the Field Level Evidence and with the Case Studies. After a careful examination of the answers to the questionnaires and to those contained in the cases studies we concluded that our original plan had to be changed. This is because all the answers are basically qualitative and almost no firm provided reliable information on quantifiable monetary benefits arising from IWA. So we had to use a different logic (similar to the one used when computing efficiency gains for the public sector), where we first identify the target population and then we identify the potential gain arising from an increasing number of PwD buying goods and services online.

To be consistent with our prior hypothesis, we assume that the potential target population is given by the 12% of PwD who do not use Internet[[157]](#footnote-157). The next step is the identification of the increased revenues that are generated when the target population switches from traditional retail to Internet retail. For this we proceed in the following fashion. First, from a study by Fresh Minds (2008), we know that –on average- each consumer buying on line spends about €767 per year when shopping on line. So, the new revenues that would be generated by the target population switching to Internet retail are given by the product of the country specific target population and the €767 average per capita revenues. However, such extra revenues are likely to come at a cost: the decrease in revenues from traditional retail coming from those who switch to ecommerce. We know that, on average, consumers that buy on the Internet spend approximately 20% more than consumers who buy using traditional retail. So we assume that the €767 includes this 20% increase and we hence compute the corresponding traditional revenues loss because of switching (traditional revenues= €767/120). We then compute total traditional revenues lost and, finally, we obtain the net gain in revenues as the difference between the increase in new revenues from eCommerce and the loss in traditional revenues.

As in previous cases we make different hypotheses concerning the percentage of the target population that is effectively affected (reached) by the IWA, and consider the following hypotheses: 1) only 5% of the target population is reached by the policy change; 2) 25% is reached; 3) 50% is reached; 4) 100% is reached. The results combining all of the above are those presented in Section 7.

* 1. Organisational level costs

Web accessibility is a discipline intensive in a specific technical knowledge that constitutes an innovation in the way websites are developed. This innovation does not come alone, as it is embedded in the process of creating websites and it has both advantages and synergies with other web technical disciplines such as SEO and usability.

The cost of making accessible websites cannot be considered as the total cost for creating a whole new website but only the proportion of extra effort (in terms of working days) to implement accessibility conformance in certain items of any website (such as images, PDF documents, multimedia pieces, etc.).

Taking into account the premises mentioned above, we have estimated the web accessibility extra-costs, considering an average of three exemplificative websites compliant with WCAG 2.0 AA level (one very simple, mostly informative, one average, mostly interactive, and one very complex, mostly transactional), combining insights from the questionnaire to web consultancies and the application of the Business Case Tool (hereinafter referred to as BCT).

In order to estimate these values we have made the following assumptions:

* If the accessible websites are developed by an external organisation (e.g. Web Accessibility consultancy, NGO, etc.), the latter is based in the same country as the client.
* An external organisation will evaluate the accessibility of the websites
* Clients will not incorporate accessibility into web management procedures
* PDF documents will not be taken into account as they are elements not strictly considered part of a web development

Specifically, the three examples of websites have the following characteristics (resulting from answers to the questionnaire):

Table 55: Estimated average website profiles and corresponding contents

| **QUESTION** | **INFORMATIVE** | **INTERACTIVE** | **TRANSACTIONAL** |
| --- | --- | --- | --- |
| **3. My website will be developed by…** | External organisation | External organisation | Own staff |
| **4. Assessment of my website…** | An external organisation will evaluate its accessibility | An external organisation will evaluate its accessibility | An external organisation will evaluate its accessibility |
| **5. Certification of my website…** | I will self-declare its accessibility level | An external organisation will certify its accessibility level | An external organisation will certify its accessibility level |
| **6. After making your website accessible, do you wish to incorporate accessibility into web management procedures?** | No | No | No |
| **7. My web management team will receive the following training, in order to learn about web accessibility & develop skills….** | I. One day course: Introduction to web accessibility and its assessment | II. Three days course: The same as I plus HTML documents, Images, Forms, Tables, in-depth assessment, etc. | III. Five days course: The same as I & II plus Flash, PDFs and JavaScript |
| **8. The number of people attending to this web accessibility training course** | 2 | 5 | 10 |
| **9. It can be classified as follows** |  |  |  |
| % of your website that only provides **static information** (i.e. it could be defined as INFORMATIVE) | 80,00% | 10,00% | 25,00% |
| % of your website that has **fora, forms, document downloading**, etc...(i.e. it could be defined as INTERACTIVE) | 10,00% | 80,00% | 25,00% |
| % of your website that has **multimedia contents, flash, pdf, online shopping, online, eGovernment, eHealth, eBanking**, etc...(i.e. it could be defined as TRANSACTIONAL/MULTIMEDIA) | 10,00% | 10,00% | 50,00% |
| TOTAL | **100,00%** | **100,00%** | **100,00%** |
| **10. Comprised of:** |  |  |  |
| **pages** | 50 | 300 | 1000 |
| **templates** | 5 | 10 | 15 |
| **transactional processes** | 0 | 2 | 5 |
| **PDF (simple)** | 0 | 0 | 0 |
| **PDF (average)** | 0 | 0 | 0 |
| **PDF (complex)** | 0 | 0 | 0 |
| **Multimedia (simple)** | 3 | 3 | 5 |
| **Multimedia(average)** | 0 | 3 | 5 |
| **Multimedia (complex)** | 0 | 1 | 5 |

Source: Study Consortium

Taking into account these contents and preferences, the estimated working days that an expert on web accessibility will spend implementing accessibility in a website is, on average, 42.44 working days, from which 36.26 working days correspond to initial work (85% of the total web accessibility effort) and 6.18 working days to annual maintenance work (15% of the total web accessibility effort):

Table 56: Estimated effort needed only to implement accessibility in a website: Initial costs

| **INITIAL COSTS** | **INFORMATIVE WD** | **INTERACTIVE WD** | **TRANSACTIONAL WD** | **AVERAGE WD** | **AVERAGE %** |
| --- | --- | --- | --- | --- | --- |
| 1. Training and skills development | 0,70 | 6,53 | 28,75 | 11,99 |  |
| 1.1 Course/ Workshop (per attendee, given that the average is 10 attendees per course. Travel expenses not included) | 0,60 | 4,50 | 15,00 | 6,70 |  |
| 1.2 Material (per attendee, given that the average is 10 attendees per course. Travel expenses not included) | 0,10 | 2,03 | 13,75 | 5,29 |  |
| 2. Design, programming and content production | 3,10 | 3,82 | 25,25 | 10,72 |  |
| 3. Accessibility assessment and first certification | 8,10 | 12,92 | 19,62 | 13,55 |  |
| 3.1 First assessment | 7,85 | 8,69 | 13,58 | 10,04 |  |
| 3.2 First certification | 0,25 | 4,23 | 6,04 | 3,50 |  |
| 4. Incorporating web accessibility procedures into web management | 0,00 | 0,00 | 0,00 | 0,00 |  |
| **Subtotal Initial Costs** | **11,90** | **23,27** | **73,62** | **36,26** | **85%** |

Source: Study Consortium

Table 57: Estimated effort needed only to implement accessibility in a website: Ongoing costs and Total Extra Web Accessibility Cost

| **ONGOING COSTS** | **INFORMATIVE WD** | **INTERACTIVE WD** | **TRANSACTIONAL WD** | **AVERAGE WD** | **AVERAGE %** |
| --- | --- | --- | --- | --- | --- |
| 5. Ongoing annual costs | 2,24 | 6,64 | 9,66 | 6,18 |  |
| 5.1 Assessment | 1,99 | 2,42 | 3,62 | 2,68 |  |
| 5.2 Certification | 0,25 | 4,23 | 6,04 | 3,50 |  |
| **Subtotal Ongoing Costs** | **2,24** | **6,64** | **9,66** | **6,18** | **15%** |
| **Total Extra Web Accessibility Cost** | **14,14** | **29,91** | **83,28** | **42,44** | **100%** |

Source: Study Consortium

The next step is to calculate the average cost (in euro currency) of web accessibility in every EU Member State (plus Norway, which has been included in the calculations in order to represent European Economic Area (EEA) countries). This is an important aspect as there are notable differences among Member States personnel-related costs. We have estimated the daily fee per consultant, according to the following premises:

* There is large price dispersion among the different consultancies, even when offering services in the same country, and if working in another Member State, subsistence and travel allowances should be added.
* Personnel cost ceilings for technicians and managers in each country are obtained from the instructions for completing the application form for proposals applying to the “Lifelong Learning Programme (LLP)” for "Multilateral projects, networks, accompanying measures, studies and comparative research” in 2009.
* The total number of working days is distributed as follows: 10% are taken up for managerial tasks, and 90% for technical tasks.
* Indirect costs are calculated as 30% of personnel costs. This percentage is applied to some funding instruments such as the Pilots under the CIP ICT-PSP programme. Different percentages can be claimed other funding instruments in the different EC programmes.
* The benefit margin is calculated as 30% of the total costs (i.e. personnel costs plus indirect costs).

Table 58 below shows the calculations of daily fee per consultant (2009).

Table 58: Daily fee per consultant

| **Country** | **Technician** | **Manager** | **Average cost** | **% IC** | **Indirect costs** | **Total costs** | **% margin** | **Profit** | **Total daily fees** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Austria** | €240 | €419 | €257.90 | 30 % | €77.37 | €335.27 | 30 % | €100.58 | **€435.85** |
| **Belgium** | €260 | €376 | €271.60 | 30 % | €81.48 | €353.08 | 30 % | €105.92 | **€459** |
| **Bulgaria** | €55 | €79 | €57.40 | 30 % | €17.22 | €74.62 | 30 % | €22.39 | **€97.01** |
| **Cyprus** | €165 | €304 | €178.90 | 30 % | €53.67 | €232.57 | 30 % | €69.77 | **€302.34** |
| **Czech Republic** | €104 | €144 | €108 | 30 % | €32.40 | €140.40 | 30 % | €42.12 | **€182.52** |
| **Denmark** | €341 | €489 | €355.80 | 30 % | €106.74 | €462.54 | 30 % | €138.76 | **€601.30** |
| **Estonia** | €75 | €117 | €79.20 | 30 % | €23.76 | €102.96 | 30 % | €30.89 | **€133.85** |
| **Finland** | €213 | €361 | €227.80 | 30 % | €68.34 | €296.14 | 30 % | €88.84 | **€384.98** |
| **France** | €235 | €424 | €253.90 | 30 % | €76.17 | €330.07 | 30 % | €99.02 | **€429.09** |
| **Germany** | €253 | €363 | €264 | 30 % | €79.20 | €343.20 | 30 % | €102.96 | **€446.16** |
| **Greece** | €187 | €267 | €195 | 30 % | €58.50 | €253.50 | 30 % | €76.05 | **€329.55** |
| **Hungary** | €93 | €141 | €97.80 | 30 % | €29.34 | €127.14 | 30 % | €38.14 | **€165.28** |
| **Ireland** | €348 | €479 | €361.10 | 30 % | €108.33 | €469.43 | 30 % | €140.83 | **€610.26** |
| **Italy** | €225 | €568 | €259.30 | 30 % | €77.79 | €337.09 | 30 % | €101.13 | **€438.22** |
| **Latvia** | €85 | €131 | €89.60 | 30 % | €26.88 | €116.48 | 30 % | €34.94 | **€151.42** |
| **Lithuania** | €67 | €103 | €70.60 | 30 % | €21.18 | €91.78 | 30 % | €27.53 | **€119.31** |
| **Luxembourg** | €343 | €493 | €358 | 30 % | €107.40 | €465.40 | 30 % | €139.62 | **€605.02** |
| **Malta** | €91 | €123 | €94.20 | 30 % | €28.26 | €122.46 | 30 % | €36.74 | **€159.20** |
| **Norway\*** | €392 | €553 | €408.10 | 30 % | €122.43 | €530.53 | 30 % | €159.16 | **€689.69** |
| **Netherlands** | €264 | €381 | €275.70 | 30 % | €82.71 | €358.41 | 30 % | €107.52 | **€465.93** |
| **Poland** | €103 | €161 | €108.80 | 30 % | €32.64 | €141.44 | 30 % | €42.43 | **€183.87** |
| **Portugal** | €119 | €183 | €125.40 | 30 % | €37.62 | €163.02 | 30 % | €48.91 | **€211.93** |
| **Romania** | €93 | €155 | €99.20 | 30 % | €29.76 | €128.96 | 30 % | €38.69 | **€167.65** |
| **Slovakia** | €95 | €133 | €98.80 | 30 % | €29.64 | €128.44 | 30 % | €38.53 | **€166.97** |
| **Slovenia** | €183 | €252 | €189.90 | 30 % | €56.97 | €246.87 | 30 % | €74.06 | **€320.93** |
| **Spain** | €204 | €294 | €213 | 30 % | €63.90 | €276.90 | 30 % | €83.07 | **€359.97** |
| **Sweden** | €355 | €505 | €370 | 30 % | €111 | €481.00 | 30 % | €144.30 | **€625.30** |
| **United Kingdom** | €311 | €469 | €326.80 | 30 % | €98.04 | €424.84 | 30 % | €127.45 | **€552.29** |

Source: the “Lifelong Learning Programme (LLP)” for "Multilateral projects, networks, accompanying measures, studies and comparative research” in 2009.

With the daily fees that consultancies charge their clients, the Study Consortium is able to calculate the average cost (in euro currency) of web accessibility for a given website (having into account all premises mentioned above):

Table 59: Total Costs attributable to web accessibility for a given website

| **Country** | **Total daily fees** | **Total average WD attributable to web accessibility for a given website** | **TOTAL COSTS attributable to web accessibility for a given website** |
| --- | --- | --- | --- |
| **Austria** | **€435.85** | 42.44 | **€18,499.62** |
| **Belgium** | **€459.00** | 42.44 | **€19,482.35** |
| **Bulgaria** | **€97.01** | 42.44 | **€4,117.40** |
| **Cyprus** | **€302.34** | 42.44 | **€12,832.81** |
| **Czech Republic** | **€182.52** | 42.44 | **€7,747.03** |
| **Denmark** | **€601.30** | 42.44 | **€25,522.16** |
| **Estonia** | **€133.85** | 42.44 | **€5,681.16** |
| **Finland** | **€384.98** | 42.44 | **€16,340.50** |
| **France** | **€429.09** | 42.44 | **€18,212.70** |
| **Germany** | **€446.16** | 42.44 | **€18,937.19** |
| **Greece** | **€329.55** | 42.44 | **€13,987.69** |
| **Hungary** | **€165.28** | 42.44 | **€7,015.37** |
| **Ireland** | **€610.26** | 42.44 | **€25,902.34** |
| **Italy** | **€438.22** | 42.44 | **€18,600.05** |
| **Latvia** | **€151.42** | 42.44 | **€6,427.17** |
| **Lithuania** | **€119.31** | 42.44 | **€5,064.26** |
| **Luxembourg** | **€605.02** | 42.44 | **€25,679.97** |
| **Malta** | **€159.20** | 42.44 | **€6,757.13** |
| **Norway\*** | **€689.69** | 42.44 | **€29,273.73** |
| **Netherlands** | **€465.93** | 42.44 | **€19,776.45** |
| **Poland** | **€183.87** | 42.44 | **€7,804.42** |
| **Portugal** | **€211.93** | 42.44 | **€8,995.16** |
| **Romania** | **€167.65** | 42.44 | **€7,115.79** |
| **Slovakia** | **€166.97** | 42.44 | **€7,087.10** |
| **Slovenia** | **€320.93** | 42.44 | **€13,621.86** |
| **Spain** | **€359.97** | 42.44 | **€15,278.87** |
| **Sweden** | **€625.30** | 42.44 | **€26,540.75** |
| **United Kingdom** | **€552.29** | 42.44 | **€23,441.94** |

Source: Study Consortium’s elaboration

The next stage is the estimation of the number of non-accessible web sites, for both private and public sector, given that these are the sites mostly affected by the policy change.

For the public sector, the Study Consortium had to identify the number of potential websites affected by the policy. The number of public entities at the different NUTS levels[[158]](#footnote-158) for the different EU countries has been measured.

The NUTS classification is a hierarchical system for dividing up theeconomic territory of the EU for the purpose of :

* The collection, development and harmonisation of EU regional statistics.
* Socio-economic analyses of the regions.
  + [NUTS 1: major socio-economic regions](http://ec.europa.eu/eurostat/ramon/nomenclatures/index.cfm?TargetUrl=LST_CLS_DLD&StrNom=NUTS_33&StrLanguageCode=EN)
  + [NUTS 2: basic regions for the application of regional policies](http://ec.europa.eu/eurostat/ramon/nomenclatures/index.cfm?TargetUrl=LST_CLS_DLD&StrNom=NUTS_33&StrLanguageCode=EN)
  + [NUTS 3: as small regions for specific diagnoses](http://ec.europa.eu/eurostat/ramon/nomenclatures/index.cfm?TargetUrl=LST_CLS_DLD&StrNom=NUTS_33&StrLanguageCode=EN)
* Framing of [EU regional policies](http://ec.europa.eu/regional_policy/index_en.htm).

However, we do not know exactly how many sites exist (or should exist, for that matter) for each level of government. From the traditional eGovernment benchmarking (see for instance Capgemini, 2007), we know what is the percentage of public services that are covered by fully functioning eGovernment services (full online availability index), but we do not know the universe to which this percentage refers. So we have to rely on assumptions. We have assumed that for NUTS1 level the number of potential sites is 100 per entity (i.e. there are 100 national level websites for each State), while for NUTS 3 level[[159]](#footnote-159) it is equal to 10 (10 for each Region). For NUTS 4 (provinces) and NUTS 5 (municipalities) we assume a value of 3 (i.e. 3 for each Province and Municipality).

Table 60: Estimated sites per NUTS level

| **Web sites for NUTS 1** | 100 |
| --- | --- |
| **Web sites for NUTS 2** | 1 |
| **Web sites for NUTS 3** | 10 |
| **Web sites for NUTS 4** | 3 |
| **Web sites for NUTS 5** | 3 |

Source: Study Consortium’s elaboration

The number of public web sites at EU level is presented in Table 61 below:

Table 61: Estimated number of public sector websites

| **COUNTRY** | **NUTS 1** | **NUTS 2** | **NUTS 3** | **NUTS 4** | **NUTS 5** | **TOTAL GOVERNMENTAL WEBSITES** |
| --- | --- | --- | --- | --- | --- | --- |
| **Austria** | 100 | 3 | 90 | 105 | 7,071 | **7,369** |
| **Belgium** | 100 | 3 | 110 | 132 | 1,767 | **2,112** |
| **Bulgaria** | 100 | 2 | 60 | 84 | 15,912 | **16,158** |
| **Cyprus** | 100 | 1 | 10 | 3 | 1,845 | **1,959** |
| **Czech Republic** | 100 | 1 | 80 | 42 | 18,747 | **18,970** |
| **Denmark** | 100 | 1 | 50 | 33 | 6,732 | **6,916** |
| **Estonia** | 100 | 1 | 10 | 15 | 681 | **807** |
| **Finland** | 100 | 2 | 50 | 60 | 1,035 | **1,247** |
| **France** | 100 | 9 | 260 | 300 | 110,046 | **110,715** |
| **Germany** | 100 | 16 | 390 | 1287 | 36,687 | **38,480** |
| **Greece** | 100 | 4 | 130 | 153 | 18,390 | **18,777** |
| **Hungary** | 100 | 3 | 70 | 60 | 9,456 | **9,689** |
| **Ireland** | 100 | 1 | 20 | 24 | 10,323 | **10,468** |
| **Italy** | 100 | 5 | 210 | 321 | 24,300 | **24,936** |
| **Latvia** | 100 | 1 | 10 | 18 | 1,572 | **1,701** |
| **Lithuania** | 100 | 1 | 10 | 30 | 1,665 | **1,806** |
| **Luxembourg** | 100 | 1 | 10 | 3 | 348 | **462** |
| **Malta** | 100 | 1 | 10 | 6 | 204 | **321** |
| **Netherlands** | 100 | 4 | 120 | 120 | 1,323 | **1,667** |
| **Norway\*** | 100 | 1 | 190 | 0 | 1,290 | **1,581** |
| **Poland** | 100 | 6 | 160 | 198 | 7,434 | **7,898** |
| **Portugal** | 100 | 3 | 70 | 90 | 12,780 | **13,043** |
| **Romania** | 100 | 4 | 80 | 126 | 9,540 | **9,850** |
| **Slovakia** | 100 | 1 | 40 | 24 | 8,784 | **8,949** |
| **Slovenia** | 100 | 1 | 20 | 36 | 630 | **787** |
| **Spain** | 100 | 7 | 190 | 177 | 24,336 | **24,810** |
| **Sweden** | 100 | 3 | 80 | 63 | 870 | **1,116** |
| **United Kingdom** | 100 | 12 | 370 | 399 | 31,905 | **32,786** |
|  |  |  |  |  |  | **375,380** |

Source: Study Consortium’s elaboration

This generates a total number of potential sites equal to 375,380, which is not too far from the implicit estimate resulting from the Capgemini study if we assume that each level of government offers about 20 services, that for each service we have 5 websites and that the 11.000 local sites analysed in the report represent 8% of the total population (to which we have to add the 3000 national sites). Afterwards, this Study Consortium had to estimate the number of websites that might be rendered accessible. According to the Study MeAC2, after ten years of voluntary policy action and political commitments, and despite Member States' efforts, progress in web-accessibility (and e-accessibility) remains slow.

In terms of web accessibility, the minimum compliance level is AA. On the one hand we have totally inaccessible websites (33% on average at EU level). On the other one, we have websites compliant only with WCAG 1.0 A level, which should be improved in order to reach AA level. In order to reflect the costs of these upgrading to AA level, it has been estimated that the overall number of inaccessible websites (defined as those below WCAG 1.0 AA level) are:

Estimated inaccessible gov webs= non-accessible government websites +33%\*government websites compliant WCAG 1.0 A

The factor applied (33%) corresponds to the estimation that one third of the total content of each WCAG 1.0 A website is still inaccessible. Applying this formula to the MeAC2 (2011) scores, the estimated percentages of inaccessible governmental websites are:

Table 62: Estimated percentage of inaccessible governmental websites per country

| **COUNTRY** | **% of non-accessible governmental websites** | **% governmental websites compliant with WCAG 1.0 A** | **Estimated % of inaccessible governmental websites per country\*** |
| --- | --- | --- | --- |
| **Czech Republic** | 38 | 50 | 54 |
| **Denmark** | 25 | 63 | 46 |
| **France** | 25 | 50 | 42 |
| **Germany** | 38 | 38 | 50 |
| **Greece** | 88 | 13 | 92 |
| **Hungary** | 75 | 25 | 83 |
| **Ireland** | 25 | 38 | 37 |
| **Italy** | 13 | 50 | 29 |
| **Netherlands** | 25 | 50 | 42 |
| **Norway** | 38 | 38 | 50 |
| **Portugal** | 50 | 50 | 67 |
| **Spain** | 0 | 25 | 8 |
| **Sweden** | 13 | 50 | 29 |
| **United Kingdom** | 13 | 25 | 21 |
| **EU average** | **33** | **40** | **46** |

Source: Own elaboration based on MeAC2 study (evaluation of governmental websites 2011 data)

Therefore, if we multiply the estimated percentage of inaccessible public websites by the number of public websites and the average cost of implementing web accessibility we can obtain the estimated costs for web accessibility. Notice that we distinguish between set up costs (i.e. costs that are paid only once when implementing WA for the first time) and maintenance costs[[160]](#footnote-160) (which are yearly cost to be paid for the full period in which the web accessible site is in place). Our estimates indicate that the total cost for making accessible all EU governmental websites to WCAG AA level is €2,452,217,930.15, from which €2,095,103,324.80 correspond to the initial set-up costs and €357,114,605.35 to the annual maintenance for implementation of the WCAG 2.0 AA level:

(Please note that the percentage of inaccessible governmental websites applied is the EU average, due to the lack of national parameters. Source: Study Consortium’s elaboration)

Table 63: Estimated web accessibility cost for governmental websites per country

| **COUNTRIES** | **TOTAL NUMBER OF GOVERNMENTAL WEBSITES** | **TOTAL COSTS attributable to web accessibility for an average website** | **% inaccessible GOVERNMENTAL websites+0,33% of WCAG 1.0 A** |
| --- | --- | --- | --- |
| Austria\* | **7,369** | €18,499.62 | 46% |
| Belgium\* | **2,112** | €19,482.35 | 46% |
| Bulgaria\* | **16,158** | €4,117.40 | 46% |
| Cyprus\* | **1,959** | €12,832.81 | 46% |
| Czech Republic | **18,970** | €7,747.03 | 54% |
| Denmark | **6,916** | €25,522.16 | 46% |
| Estonia\* | **807** | €5,681.16 | 46% |
| Finland\* | **1,247** | €16,340.50 | 46% |
| France | **110,715** | €18,212.70 | 42% |
| Germany | **38,480** | €18,937.19 | 50% |
| Greece | **18,777** | €13,987.69 | 92% |
| Hungary | **9,689** | €7,015.37 | 83% |
| Ireland | **10,468** | €25,902.34 | 37% |
| Italy | **24,936** | €18,600.05 | 29% |
| Latvia\* | **1,701** | €6,427.17 | 46% |
| Lithuania\* | **1,806** | €5,064.26 | 46% |
| Luxembourg | **462** | €25,679.97 | 46% |
| Malta\* | **321** | €6,757.13 | 46% |
| Netherlands | **1,667** | €29,273.73 | 42% |
| Norway | **1,581** | €19,776.45 | 50% |
| Poland\* | **7,898** | €7,804.42 | 46% |
| Portugal | **13,043** | €8,995.16 | 67% |
| Romania\* | **9,850** | €7,115.79 | 46% |
| Slovakia\* | **8,949** | €7,087.10 | 46% |
| Slovenia\* | **787** | €13,621.86 | 46% |
| Spain | **24,810** | €15,278.87 | 8% |
| Sweden | **1,116** | €26,540.75 | 29% |
| United Kingdom | **32,786** | €23,441.94 | 21% |
| TOTAL | **375,380** | - | - |

Source: Study Consortium’s elaboration

Table 63 cont: Estimated web accessibility cost for governmental websites per country

| **COUNTRIES** | **TOTAL COST FOR GOVERNMENTAL WEBSITES** | **INITIAL COSTS (85%)** | **ONGOING COSTS(15%)** |
| --- | --- | --- | --- |
| Austria\* | €62,735,128.35 | €53,599,060.01 | €9,136,068,34 |
| Belgium\* | €18,935,403.83 | €16,177,855.58 | €2,757,548.25 |
| Bulgaria\* | €30,616,136.70 | €26,157,532.33 | €4,458,604.37 |
| Cyprus\* | €11,568,995.94 | €9,884,211.99 | €1,684,783.95 |
| Czech Republic | €79,359,035.95 | €67,802,040.77 | €11,556,995.18 |
| Denmark | €80,533,271.73 | €68,805,273.50 | €11,727,998.23 |
| Estonia\* | €2,109,840.42 | €1,802,585.99 | €307,254.43 |
| Finland\* | €9,377,154.37 | €8,011,566.61 | €1,365,587.76 |
| France | €836,813,733.69 | €714,949,195.23 | €121,864,538.46 |
| Germany | €363,440,596.11 | €310,513,022.49 | €52,927,573.63 |
| Greece | €240,650,264.02 | €205,604,551.73 | €35,045,712.29 |
| Hungary | €56,586,598.68 | €48,345,935.97 | €8,240,662.71 |
| Ireland | €101,340,709.60 | €86,582,540.24 | €14,758,169.36 |
| Italy | €134,505,127.70 | €114,917,249.72 | €19,587,877.98 |
| Latvia\* | €5,031,103.08 | €4,298,427.42 | €732,675.66 |
| Lithuania\* | €4,208,945.86 | €3,596,000.32 | €612,945.54 |
| Luxembourg | €5,459,789.44 | €4,664,684.52 | €795,104.92 |
| Malta\* | €998,175.32 | €852,811.82 | €145,363.50 |
| Netherlands | €20,251,716.00 | €17,302,474.23 | €2,949,241.78 |
| Norway | €15,594,199.36 | €13,323,228.13 | €2,270,971.22 |
| Poland\* | €28,365,922.82 | €24,235,015.37 | €4,130,907.46 |
| Portugal | €78,020,407.32 | €66,658,355.59 | €11,362,051.73 |
| Romania\* | €32,255,129.87 | €27,557,840.19 | €4,697,289.68 |
| Slovakia\* | €29,186,521.95 | €24,936,111.28 | €4,250,410.68 |
| Slovenia\* | €4,933,448.39 | €4,214,994.11 | €718,454.28 |
| Spain | €31,273,166.24 | €26,718,879.17 | €4,554,287.07 |
| Sweden | €8,589,649.72 | €7,338,745.65 | €1,250,904.06 |
| United Kingdom | €159,477,757.67 | €136,253,134.85 | €23,224,622.82 |
| TOTAL | **€2,452,217,930.15** | **€2,095,103,324.80** | **€357,114,605.35** |

Source: Study Consortium’s elaboration

For private sector firms this number is assumed equal to the country-specific number of enterprises as given by Eurostat[[161]](#footnote-161) (separately for financial and non-financial). Then, from the current edition of the MeAC study we have an estimate of the number of sites that are already accessible, so we can get an estimate of the number of sites that are not accessible yet. Then we proceed as for public organisations: we multiply the number of non-accessible sites by the average number of days necessary to make the sites accessible (according to WCAG 2.0 AA level) and by the average country-specific daily fee. In Table 64 and Table 65 we summarise our findings:

Table 64: Cost of IWA for private sector enterprise of all size

|  | **Private Sector Yearly Costs** | **Private Sector Set Up Costs** |
| --- | --- | --- |
| **TOTAL COSTS** | 35,540,829,076 | 201,398,031,430 |

Source: Authors elaboration using parameters from Field Level Evidence questionnaire and applying them to Eurostat Structural Business Statistics

Table 65: Cost of IWA for public sector

|  | **Public Sector Yearly Costs** | **Public Sector Set Up Costs** |
| --- | --- | --- |
| **TOTAL COSTS** | 358,368,500 | 2,030,754,833 |

Source: Authors elaboration using parameters from Field Level Evidence questionnaire and applying them using information from EU NUTS nomenclature and from Capgemini benchmarking (confidential interview with the professional who designed and managed the survey from 2002 until 2007)

For the private sector the aggregate cost of yearly maintenance are close to €35.5 billion and the one-off set-up cost are about €201 billion. For the public sector the aggregate cost of yearly maintenance are about €358 million and the one-off set-up cost are approximately €2 billion. Having stated this, and transparently reported the limits of our findings in the Field Level Evidence and Case Studies, we nonetheless want to stress that the projections of aggregate costs that we produce are one of a kind in terms of at least being informed by empirical information. Earlier aggregate estimates of costs, such as those in the 2007 Impact Assessment (European Commission 2007) and in the Empirica study (Cullen et al 2008), only used rule of thumb parameters to estimate costs.

Annex 6: Understanding Web Accessibility

**Web accessibility is about designing sites so that as many people possible can access and interact with them effectively and easily, independent of who they are or how they access the net.**

This particularly benefits people with disabilities and older people, many of whom see the web as an empowering medium giving them access to information and services that they either would not have access to in person or would have to rely on other people to provide

* 1. Assistive technology

People with disabilities often use something called adaptive or assistive technology to access the web. For example blind web users will use software called a screen reader which reads aloud the content of a web page; Jaws, Window-Eyes and NVDA are popular examples of screen readers.

Adaptive software relies on web pages being designed accessibly to function properly. If websites aren’t designed in an accessible manner then disabled web users will frequently have a hard time understanding what is on a web page.

* 1. Changing browser options

Many people with disabilities, particularly those with mild visual impairments or dyslexia, don’t need to use adaptive technology to access the web, instead they rely on being able to change how a web page looks by increasing the text font size or by applying different colour schemes or background colours, for example people with dyslexia often find black text on a beige background the easiest to read.

Depending on how a website has been designed making these changes can either be very easy and straightforward if it is accessible, or it can be a complex drawn out process if a site has not been designed with accessibility in mind.

* 1. An introduction to accessibility guidelines

**There are a number of accessibility standards in circulation, e.g. various national standards, with Section 508 (USA) probably the best known.** However they all stem from the same set of guidelines produced by the World Wide Web Consortium (W3C) called the Web Content Accessibility Guidelines (WCAG). These guidelines were created in 1999 to explain how to make websites accessible to people with disabilities.

* + 1. WCAG 1.0

The history of Web Content Accessibility Guidelines dates back to May 1999 when version 1.0 was released as a recommendation. WCAG 1.0 had a list of checkpoints falling into priority levels 1-3:

* **Priority 1**: checkpoints must be satisfied, as otherwise people from one or more groups are likely to experience barriers while accessing web content
* **Priority 2**: checkpoints should be satisfied, as this will reduce the amount of difficulty faced by one or more access needs groups
* **Priority 3**: checkpoints may be satisfied to improve the ease of use.

Complying with priorities 1, 2, and 3 was described as being WCAG 1.0 A, AA, and AAA compliant respectively.

* + 1. WCAG 2.0

WCAG 2.0 was published as a recommendation in December 2008, having received input from accessibility experts and people from the disability community. WCAG 2.0 is designed to be technology-independent, easier to understand, and is based around the four principles of accessible content: Perceivable, Operable, Understandable, and Robust (POUR). Each principle is divided into guidelines and each guideline has testable success criteria. Therefore, conformance with WCAG 1.0 was determined by checkpoints, whereas conformance with WCAG 2.0 is determined by success criteria.

* + 1. The differences

A significant difference between WCAG 1.0 to 2.0 is that some success criteria were promoted to a different level, meaning that WCAG 1.0 AA does not correspond to WCAG 2.0 AA. For example, WCAG 1.0 checkpoint 9.4 Logical tab order was promoted from priority 3 to level A (WCAG 2.0 success criterion 2.4.3 Focus Order). In general, a page conforming to WCAG 2.0 AA is more accessible than WCAG 1.0 AA.

* 1. Content production

With web sites becoming increasingly more complex as new technology arises, this reflects on the content of web pages. Content is no longer limited to some simple text, but contains multimedia objects, interactive elements and complex formatting. Content creation is also becoming more complex. It is no longer possible for a single web developer to write the HTML code manually; instead various content creation tools are used.

There are a variety of tools available. These include stand-alone WYSIWYG editors and online Content Management Systems (CMS):

* **WYSIWYG** stands for "What You See Is What You Get", meaning that when editing a page the user will see what the page looks like, similar to the user interface of modern Word Processing software. The advantage is that only a limited amount of technical skills is required to create and edit content.
* A **CMS** is a "Content Management System". This is an online system where authors can log in and change or add content. Some of these systems also use a WYSIWYG interface, others use plan text editor where formatting needs to be entered using certain tags. The advantage of a CMS is that it is easier for a number of authors to collaboratively edit and update a web site.

There are two issues for all content production systems in relation to accessibility:

* Accessibility of the content production system itself
* Accessibility of the code the system creates.

The W3C has created guidelines for Authoring tools that cover both these issues: W3C Authoring Tool Accessibility Guidelines (ATAG) 2.0 - ATAG 2.0 (available at <http://www.w3.org/TR/ATAG20/>)

A good content authoring tool will enable, support and promote the creation of accessible content. For example, it needs to offer a way to add alternative text to an image in order to create accessible content. A good tool may go a step further and actively prompt the user to enter alternative text when an image is inserted. On the other hand the tool itself also needs to be accessible to all users, regardless their abilities.

1. [↑](#footnote-ref-1)
2. See <http://epp.eurostat.ec.europa.eu/cache/ITY_SDDS/en/hlth_status_silc_esms.htm> for full information on the EU-SILC health status module. See also <http://circa.europa.eu/Public/irc/dsis/health/library?l=/methodologiessandsdatasc/healthsinterviewssurvey/2007-2008_methodology/2007-2008_questionspdf/_EN_1.0_&a=d> and

   <http://europa.eu.int/eur-lex/pri/en/oj/dat/2003/l_298/l_29820031117en00340085.pdf>

   especially <http://epp.eurostat.ec.europa.eu/cache/ITY_SDDS/Annexes/hlth_status_silc_esms_an2.pdf> questions of EU SILC [↑](#footnote-ref-2)
3. See: <http://ec.europa.eu/information_society/events/ict_riga_2006/doc/declaration_riga.pdf> [↑](#footnote-ref-3)
4. Persons with disabilities (45.1 million) and those aged 65 and above that are not disabled (64.9 million) for a total of 110 million individuals. See Table 32 for more details. [↑](#footnote-ref-4)
5. For further information, see Annex §2.4.1 [↑](#footnote-ref-5)
6. <http://ec.europa.eu/governance/impact/planned_ia/docs/2011_infso_023_web_accessibility_en.pdf> [↑](#footnote-ref-6)
7. In our gathering and analysis of secondary sources, statistics, and to some extent of field level empirical evidence we have taken the wider possible perspective as to capture in a 360 fashion all the possible relevant issues concerning costs and benefits. Then, in elaborating this material into a causal model and extracting from it what we considered the most important key aspects we have applied a first filter. We formulated general causal hypotheses and operationalised them into key aspects only for issues where we found robust enough theoretical and empirical evidence. [↑](#footnote-ref-7)
8. First, qualitative key aspects by definition do not have a direct and immediate measurement in volume or monetary value. This, however, does not mean that in principle they could not be quantified. For instance, if we take the users benefit “increased self-esteem deriving to IWA from the possibility of doing things online” they could potentially be given a monetary value through ‘hedonistic prices’ and ‘willingness to pay’ techniques. Economists to evaluate all those cases of public goods that do not have a market price apply these techniques. These techniques, however, require data from large surveys asking individuals about their willingness to pay and about the subjectively perceived utility of the intangible benefit being measured. Improvement in corporate social image is an organisational level benefits not directly measurable but that could be quantified with some efforts. For instance, one could take the total budget spent by an organisation in Corporate Social Responsibility (CSR), divide it by number of customers served, and then check whether years by years the increase in number of customers would compensate the additional CSR budget spent to make corporate website fully accessible and manage it. This would be a measure comparing the marginal returns of IWA (with the assumption that improved social image results in more customers) to its marginal costs. However, this would require longitudinal data about the organisations CSR spending and about their customer base before and after the investments into IWA. A single organisation willing to seriously develop the business case for investing in IWA and to monitor ex post the results could try and measure both these two kind of qualitative benefits.   
   In order to do this at aggregate EU27 level we would have required standardised and comparable statistics for such kind of measurements for all countries, and it is probably pleonastic to add that nothing of this sort exists at either country or at EU27 level today. It also goes without saying that constructing from scratch such measures for even only a few of the EU27 countries was out of our scope, considering the time-frame and resources available for this study. Having said this, we need to reiterate that evidence on the plausibility of all the 32 key aspects exist and that they can be used a micro level to make the business case. Having clarified the above, we can move also to explain why we selected for aggregate EU27 quantification only a subset of key aspects among the total number of those that we identified as suitable for measurement in monetary terms. Again, feasibility and resources constraints are only a very marginal element in explaining our choices. Computational techniques today are so advanced and fully mustered by our experts that, if the data were available, the marginal increase in the time needed to make projections on 16 items instead of 7 asymptotically approaches zero. We chose to produce aggregate quantifications for only 7 key aspects because they were those: a) for which we could maximise the use of reliable and comparable official international statistics; b) for which we could minimise the application of assumptions and the need to estimate missing data; c) for which backing of the hypothesised casual relations between IWA (policy input) and benefits or costs (outcomes) in the theoretical and empirical literature was strongest. [↑](#footnote-ref-8)
9. The BCTs are informed by the causal model and key aspects and has been designed also in relation to testing in the case studies. In the same way the quantitative projections are constructed for a few key aspects using some of the hypotheses of the causal model, secondary sources evidence and statistics, and insights from the FLE, case studies and the BCT Macro. So, the BCT Micro and quantitative projections share common elements but it is important to repeat that they are different. One is a micro level tool that organisation may use in the future to build their eAccessibility business case, the other is a macro level projection of potential benefits and costs under several 'what if' assumptions and scenarios presented in Annex §2.4.1. Therefore, the reader can find commonalities but should not expect a one to one matching between BCT Micro and quantitative projections that are based on BCT Macro assumptions. [↑](#footnote-ref-9)
10. For further information, see Annex §2.4.1 [↑](#footnote-ref-10)
11. The statistical sources and analysis leading to the quantification of the overall pool of affected individuals is presented in Annex I. [↑](#footnote-ref-11)
12. Indeed Web Accessibility can also benefit individuals with limited technical equipment (out-dated modems, poor internet connections) or with browsers on Personal Digital Assistants (PDAs) and mobile phones, people with situational constraints (e.g., hands-free environment). Yet, we did not included these additional targets for was not possible to quantify them without double-counting. [↑](#footnote-ref-12)
13. “28 CFR Parts 35 and 36 Non-discrimination on the Basis of Disability in State and Local Government Services; Final Rules. This rule is part of the US ADA (Anti-discrimination Act) body of legislation. [↑](#footnote-ref-13)
14. Several authors on both sides of the Atlantic have argued and shown that the digital exclusion of people with disabilities is not only a matter of technological barriers and is also caused by lack of awareness and motivation and by lack of the means of access to online services and information due to their disadvantaged socio-economic status (see among many others Dobransky & Hargittai 2006; Neff et al 2009; Pilling et al 2004; Work Research Centre 2008). It may be possible that some PwD simply do not want to go online, while in many other instances such a decision may reflect a lack of understanding about the opportunities offered by the Internet: they do not realize the wealth of information and social connections that the use of the medium would make possible (Dobransky & Hargittai 2006, p. 317). [↑](#footnote-ref-14)
15. While the Box 1 report figure concerning only European countries, similar statistics can be found, for instance, for the US and Australia. For the situation in the US see Kaye (2000), Brault & Stern (2007) and Brault (2008), National Bureau of Labour Statistics (2009). The social situations of individuals with disabilities in Australia is described in details in Hollier (2007, pp. 59-69). [↑](#footnote-ref-15)
16. The report *Men and Women with Disabilities in the EU*, based on the analysis and elaboration conducted on the ad hoc module of Eurostat Survey (dated 2002) and on the EU-SILC (The first data collection of the EU Statistics on Incomes and Living Conditions panel – carried out in 2004). [↑](#footnote-ref-16)
17. Please note that in the first bullet point we are comparing similar year (2002) for similar group (EU15) as we are forced to do so by the fact that the figure from the 2002 Eurobarometer is the only source from which we found aggregate data on usage of the Internet by individuals with disabilities. We are aware that in 2010, according to most recent Eurostat data, the percentage of households having access to the Internet from home in EU27 has reached 70%. It would be extremely useful to compare this overall growth for households (from 39% in 2002 up to 70% in 2007 almost double in only 5 years) with the growth among individuals with disabilities, but there is not data to do so. [↑](#footnote-ref-17)
18. Among such players awareness about the topic of Web Accessibility / eAccessibility is not always high and should be increased (Richard & Hanson 2004; RADAR, 2010). According to Yamada (2007) the situation for eAccessibility in general could improve if mainstream product companies should become first movers, since they have the power to pull the whole value chain in making efforts for providing accessible products for the market. An illustrative case is provided by the Raku Raku phone (Irie, Matsunaga & Nagano, 2005, vol.41, p.79), sold by Fujitsu in more than 8 million copies also to people without disability, because of a variety of accessibility functions, such as a larger button size, one-touch buttons for dedicated receiving parties, the ability to alter the text colour and the background and size of the text, a voice synthesizer through which people can listen to e-mails received by the phone, have made the product very fashionable for the mobile market in general [↑](#footnote-ref-18)
19. Two are the areas of impacts pertaining only to the benefits side: “Social Image and Brand” and “Labour Productivity and Quality”. The area “Operational Performance”, in fact, pertains to both the benefits side (increased revenues or reduced costs due to adoption of Web Accessibility) and to the cost side (investment costs and ongoing costs of introducing Web Accessibility and more generally eAccessibility into external Web sites and internal Web based and other applications). The first side will be treated here together with other benefits, and the second under the heading “costs” [↑](#footnote-ref-19)
20. It has been shown that the many chat rooms and mailing lists catering specifically to individuals with disabilities are heavily used by them (Seymour and Lupton 2004). Another important aspect is that the anonymity of online interaction enables individuals with disability to avoid the perception of others on their physical status (the social stigma) during the first interaction (Bowker and Tuffin 2002), which would then facilitate a better offline encounter (after friendship has been established online). Thus online communication allows the individual with disability to encounter and interact with others to a degree that may not be possible offline (Guo, Bricout and Huang 2005; Seymour and Lupton 2004). In brief the Internet is a mean of personal empowerment and social interaction (possibly leading to more social inclusion and participation). In Ireland, about one third of those who use the Internet regularly have said that they would feel socially excluded if they did not have Internet access for one month (Work Research Centre 2003, p.43). Well, this naturally applies (possibly even more strongly) to individuals with disabilities too. [↑](#footnote-ref-20)
21. This rule is part of the US ADA (Anti-discrimination Act) body of legislation. [↑](#footnote-ref-21)
22. Page 56236 in Federal Register/Vol. 75, No. 178/Wednesday, September 15, 2010/Rules and Regulations (retrieved from: <http://www.ada.gov/regs2010/titleII_2010/titleII_2010_fr.pdf> ). This statement is supported by more general analysis made in this document of Accessibility benefits in general and especially of benefits that can be hardly quantified such as option value and existence value. Option value is the value that people with and without disabilities derives from the option of using accessible facilities at some point in the future. As with insurance, people derive benefit from the knowledge that the option to use the accessible facility exists, even if it ultimately goes unused. Existence value is the benefit that individuals get from the plain existence of a good, service or resource—in this case, accessibility. It can also be described as the value that people both with and without disabilities derive from the guarantees of equal treatment and non-discrimination that are accorded through the provision of accessible facilities. In other words, people value living in a country that affords protections to individuals with disabilities, whether or not they themselves are directly or indirectly affected. [↑](#footnote-ref-22)
23. We here refer to general public administration public services, whereas we treat online welfare and health services separately in next sub-paragraph since their potential impact is potentially more relevant than only time saving. [↑](#footnote-ref-23)
24. In addition, the use of ICT has been shown to reduce length and frequency of hospital stays for elderly individuals with disabilities (Magnusson, Hanson and Borg 2004). Let us explain this a bit further. Patients with chronic diseases are being increasingly treated at home through remote monitoring, which in some cases requires the patient to access a Website an input his/her vital parameters. Moreover, there are disease specific Health 2.0 platform supporting chronic patients. Patients with diabetes may fully or partially loose the visual capacities and if these earlier cited Web sources are not accessible they foregone the opportunities for remote treatment and for access to information. Beyond the more health specific outcomes, the possibility to use accessible Websites can also impact positively on the subjectively perceived health related quality of life. Having a long-standing disability produce on the individuals a burden that goes beyond the strictly define objective health conditions. An individual having visual impairment due to diabetes may not experience symptoms and pain every day, yet everyday he/she is limited in the kind of activities possible to be performed autonomously. [↑](#footnote-ref-24)
25. Beside the Vienna Study finding a wage premium of about 5% for possessing digital skills, there are several other sources on this topic. According to Dolton & Makepeace (2007) on average the wage premium for using the Internet and e-mail has been estimated to be about 10%. Other UK based research place the wage premium for jobs involving computer/Internet use between three to ten% (see Jenkins et al 2007; Goodison et al 2004). In the US Di Maggio & Bonikowski (2008) have: a) demonstrated robustly significant positive associations between Web use and earnings growth, indicating that some skills and behaviours associated with Internet use were rewarded by the labour market (assuming rational behaviour on the side of employers, we can safely state that higher earnings are associated to higher workers’ productivity linked to Internet and ICT use; b) found that, in contrast to economic theory (which has led economists to focus exclusively on effects of contemporaneous workplace technology use), workers who used the Internet only at home also did better, suggesting that users may have benefited from superior access to job information or from signalling effects of using a fashionable technology. Finally, related to the capability to find a job, it must also be noted that there is evidence that being able to avail of eLearning can impact positively on the achievement of qualifications. A case study in the UK found that students in lower education attainment groups achieved nearly half a grade higher on their tests when they had more than 10 hours of e-learning (FreshMinds/UK online centres 2008, p. 10). If eLearning is not accessible to people with disabilities, this will add to the educational disadvantages that they already face in comparison to their peers (Work Research Centre 2008: p. 8) and, we add, will decrease their future chances of getting a job. [↑](#footnote-ref-25)
26. In this respect probably a good illustration is what is written in the 3-year ICT based regional growth strategy of the Hampshire County Council in the UK: “In Hampshire, there are 30000 people without work, but wishing to work, 34000 on incapacity benefit, 170000 with skills levels at NVQ1 or below and 41000 children living in families on the highest level of benefit. ICT is seen as a key enabler since 92% of jobs now involve ICT use. People with disabilities are 3 times more likely to find employment, if they have had some form of ICT training. Although many people registered as disabled can use computers effectively, equally many cannot because of minor physical or visual impairments” (HCC 2007, p. 8). Finally, an interesting case supporting the kind of causal relations discussed here can be found among those presented at the 4th European eAccessibility Forum held in Paris in 2010 (See pages 63-64 in Proceedings the from 4th European eAccessibility Forum Braillenet: <http://inova.snv.jussieu.fr/evenements/colloques/colloques/EAF2010/proceedings_en.pdf>). The MultiChancePoliTeam is a group of specialists that guarantees services to students with disabilities of Milan Politechnic University (www.polimi.it/disabilita). The initiative, among other things, support students with disabilities in their study activities, also in acquiring digital skills and in searching jobs. The initiative reports special results on Employment. Considering students with disabilities with technical degrees (engineer, Architecture, and Industrial Design) from Politecnico di Milano the initiatives obtained a 0% unemployment rate over 7 years. The University with government funds always supports the first year of employment. All students, once they have experienced good assistive technologies during their academic studies and acquired digital skills, keep using it for their private and professional lives. [↑](#footnote-ref-26)
27. See among others Kemper et al (2010) Evans (2007) Mont & Loeb (2008), PBA (2007), Rein et al (2006), Taylor et al (2006). [↑](#footnote-ref-27)
28. Two are the areas of impacts pertaining only to the benefits side: “Social Image and Brand” and “Labour Productivity and Quality”. The area “Operational Performance”, in fact, pertains to both the benefits side (increased revenues or reduced costs due to adoption of Web Accessibility) and to the cost side (investment costs and ongoing costs of introducing Web Accessibility and more generally eAccessibility into external Web sites and internal Web based and other applications). The first side will be treated here together with other benefits, and the second under the heading “costs”. [↑](#footnote-ref-28)
29. For what concerns the accessibility of internal application this naturally concerns mostly large organisations. Large-scale organisations, especially in the public sector, can have hundreds of employees with disabilities and age-related impairments using the internal systems (that today are increasingly based on browsers and so present the same issues as using a public Website). Under such circumstances, the relevance of building the image of a good employer, of complying with the law and avoiding discrimination cases, and of ensuring that all employees are equally productive is far more important than, for instance, for a small company running an eCommerce Website. The costs and benefits for these two hypothetical cases will be highly different. But the same applies also from the perspective of external Web sites: one thing is if American Express does not have an accessible Web site and banking functionalities, a different thing is again if this concerns a small company running an eCommerce Website. [↑](#footnote-ref-29)
30. The fact that Web Accessibility can benefit also older people has been amply demonstrated by specialised state of the art reviews (especially Arch 2008a, but see also Arch 2008b; empirica & Work Research Centre 2008; Work Research Centre 2003, 2008) and it is beyond our scope now to enter into the details. Here it is worth noting that these analysis of the older people as a target beneficiary of Web Accessibility will be taken into account when we will produce the aggregate estimates on benefits. Technical improvements allegedly also could reduce maintenance and ongoing costs, an issue discussed in next chapter on the key aspects. [↑](#footnote-ref-30)
31. These aspects have been experimentally tested and proved by Watanabe (2007). [↑](#footnote-ref-31)
32. The same dimensions are used also for all the others matrixes. [↑](#footnote-ref-32)
33. The first questionnaire was circulated to organisations and companies investigating the costs related to the development and maintenance of their institutional Websites. Forty three responses were received and analysed. The second questionnaire was addressed to IT companies specialized in providing Web Accessibility related services. Eleven consultancies provided responses to the questionnaire. [↑](#footnote-ref-33)
34. Respondents requested anonymity. [↑](#footnote-ref-34)
35. Readers can find a brief explanation of web accessibility-related terms in Annex 6 [↑](#footnote-ref-35)
36. This data was collected among EU web accessibility consultancies’ responses to our questionnaires, from which the study team calculated the averages for each of the intervals provided in each of the tables below. Both questionnaires are available online at <http://www.eaccessibility-impacts.eu/>. [↑](#footnote-ref-36)
37. The intervals chosen are based on experts ‘opinion, as usually a website has at least five templates: home page, contact page, sitemap page, a template page for news and a template page for regular text. Depending on the complexity of the website, more templates are needed. Prices indicated in Table 2 [↑](#footnote-ref-37)
38. From the technical point of view, the distinction between websites created with and without templates is important, as this variable (templates) affects the price of an accessible website; creating content with templates is easier, saves time and is more efficient, and therefore, cheaper. [↑](#footnote-ref-38)
39. The average costs provided are estimations based on their experiences. In order to have a more customised estimation, readers can use the BCT Micro (typing their own website characteristics). [↑](#footnote-ref-39)
40. Certifications are awarded for a certain date and compliance level. As websites are updated regularly, certificates need to be reviewed periodically in order to ensure that the certified level is still valid. Each certification body has its own procedure for this check, but it typically involves accessibility audits every 3, 6 or 12 months, and the certificate could be valid for 1 or 2 years. [↑](#footnote-ref-40)
41. This means assuming that the web developers have the same level of knowledge and effectiveness/efficiency in delivering the work. In practice we know that this is not always the case, yet this was the only way to proceed and we believe that on average it works. [↑](#footnote-ref-41)
42. On this see Henry S. L., Arch A., Brewer J. (2009) [↑](#footnote-ref-42)
43. This area refers to technical aspects, including the first evaluation/certification of the accessibility compliance (which is optional but recommendable as a proof of accessibility compliance). This section is the most difficult to estimate, as web programming, integration of technologies and upgrading technologies and tools are highly dependent on the technology used to develop the site. For example, if the client requires a non-accessible Content Management System (CMS), some additional developments would be needed to make the coding accessible. [↑](#footnote-ref-43)
44. This includes developing the structure of the website, including the information architecture (navigation schemes and naming conventions), the layout of the pages (wireframes or page schematics are created to show consistent placement of items including functional features), and matching the conceptual design with branding. It also entail developing client-side/server-side scripting, security and transactional applications (such as eCommerce or eGovernment applications) and a web template (according to the W3C, it is “a tool used to separate content from presentation in web design, and for mass-production of web documents. It is a basic component of a web template system. Web templates can be used to set up any type of website. In its simplest sense, a web template operates similarly to a form letter for use in setting up a website”) [↑](#footnote-ref-44)
45. On this see Henry S. L., Arch A., Brewer J. (2009) [↑](#footnote-ref-45)
46. On this see Henry S. L., Arch A., Brewer J. (2009) [↑](#footnote-ref-46)
47. It is important to remark that accessibility degrades over time, and it must be assumed as a procedure to manage the website. Some testing should be made periodically –each 3/6/12 months, depending on the certification body- to ensure that the website remains accessible according to the guidelines followed. [↑](#footnote-ref-47)
48. According to some of the experts interviewed, under certain technological conditions, the costs of web accessibility are the same regardless of whether the website is designed from scratch or it is retrofitted, in terms of the variables considered (training, web programming, assessing, certificating and so on). Yet, there is an important dimension of uncertainties concerning the technology used to originally design the web site in need of being retrofitted. If this technology allows for in-built accessibility then the implementation is easy and the costs are the same as for building an accessible website from scratch. If a website is built with older technological solutions then everything becomes more complicated: a) either web owner invest in upgrading the technology; b) or they maintaining the older technology and pay for substantial work needed to retrofit the existing website. Estimating such costs was impossible, due to its case-specific nature (there are countless technologies out there and millions of different organisations use different ones) out there and everything depends on the clients’ needs and preferences). [↑](#footnote-ref-48)
49. For further information, see Annex §2.4.1 [↑](#footnote-ref-49)
50. Please note that we have only considered benefits for the user perspective, as stated in our technical offer. [↑](#footnote-ref-50)
51. Please note that although it looks like it breaks even after 3 years, the value at that time is actually -0.9, meaning that it breaks even the following year, in year 4. [↑](#footnote-ref-51)
52. The Study team develop the case studies questionnaire based on the FLE questionnaire, adding more in-depth questions about the process followed in order to incorporate accessibility into their websites. Both included questions about web metrics, but unfortunately the vast majority of respondents declared not to measure these metrics linked to accessibility. Both questionnaires, plus the consultancies questionnaire, can be found at <http://www.eaccessibility-impacts.eu/> [↑](#footnote-ref-52)
53. http://ec.europa.eu/information\_society/activities/einclusion/library/studies/meac\_study/index\_en.htm [↑](#footnote-ref-53)
54. <http://www.eaccessibility-monitoring.eu/> [↑](#footnote-ref-54)
55. <http://ec.europa.eu/information_society/activities/einclusion/library/studies/web_access_compliance/index_en.htm> [↑](#footnote-ref-55)
56. <http://ec.europa.eu/governance/impact/planned_ia/docs/2011_infso_023_web_accessibility_en.pdf> [↑](#footnote-ref-56)
57. <http://www.un.org/disabilities/countries.asp?navid=12&pid=166> [↑](#footnote-ref-57)
58. <http://www.mandate376.eu/> [↑](#footnote-ref-58)
59. “Towards an accessible information society” Status and challenges of e-accessibility in Europe (COM(2008) 804 final) <http://ec.europa.eu/information_society/activities/einclusion/docs/access/comm_2008/staffwp.pdf> [↑](#footnote-ref-59)
60. Cullen et al (2007). [↑](#footnote-ref-60)
61. WITSA is a consortium of over 80 leading information and communications technology (ICT) industry associations with members representing more than 90 percent of the world ICT market. Biennially, WITSA publishes “Digital Planet”, which provides statistics on global ICT spending covering 75 countries. This publication is widely referenced by multilateral organisations as well as academic institutions worldwide. [↑](#footnote-ref-61)
62. These aspects have already been raised and discussed in previous studies, such as Cullen et al (2007) [↑](#footnote-ref-62)
63. WCAG 2.0 contains PDF techniques. This is an important development over WCAG 1.0 which was focused solely on W3C technologies such as HTML, CSS etc. Techniques available at: <http://www.w3.org/WAI/GL/WCAG20-TECHS/pdf.html> [↑](#footnote-ref-63)
64. Cullen et al (2007) [↑](#footnote-ref-64)
65. For example, although not the main focus of that study, Cullen et al (2007) provided some estimates of the overall net benefits for public administrations, based on rule-of-thumb cost yardsticks drawn from the wider literature at that time. [↑](#footnote-ref-65)
66. Cullen et al (2007). [↑](#footnote-ref-66)
67. <http://ec.europa.eu/information_society/activities/einclusion/library/studies/meac_study/index_en.htm> [↑](#footnote-ref-67)
68. See Eurostat, Disability and Social Participation, Luxembourg, Eurostat, 2001 (retrieved from: <http://ec.europa.eu/health/reports/docs/disability_en.pdf>), p. 5. [↑](#footnote-ref-68)
69. As set out in Commission Regulation (EC) No 1566/2001 of 12 July 2001. [↑](#footnote-ref-69)
70. For a description of this ad hoc module see <http://epp.eurostat.ec.europa.eu/cache/ITY_SDDS/en/hlth_empdis_esms.htm>, where the Applica study (2007) is also annexed as a key reference. The LFS sampling method and questions can be found at <http://epp.eurostat.ec.europa.eu/cache/ITY_OFFPUB/KS-BF-03-002/EN/KS-BF-03-002-EN.PDF>. Summary results can be found in Eurostat, Employment of disabled people in Europe in 2002, *Statistics in Focus, Them 3 26/2003*, (retrieved from: <http://epp.eurostat.ec.europa.eu/cache/ITY_OFFPUB/KS-NK-03-026/EN/KS-NK-03-026-EN.PDF> ) [↑](#footnote-ref-70)
71. See <http://epp.eurostat.ec.europa.eu/cache/ITY_SDDS/en/hlth_status_silc_esms.htm> for full information on the EU-SILC health status module. See also <http://circa.europa.eu/Public/irc/dsis/health/library?l=/methodologiessandsdatasc/healthsinterviewssurvey/2007-2008_methodology/2007-2008_questionspdf/_EN_1.0_&a=d> and

    <http://europa.eu.int/eur-lex/pri/en/oj/dat/2003/l_298/l_29820031117en00340085.pdf>, and for the questions generating the data on disabilities see <http://epp.eurostat.ec.europa.eu/cache/ITY_SDDS/Annexes/hlth_status_silc_esms_an2.pdf> . [↑](#footnote-ref-71)
72. Micro-data are the raw data generated by the answers given by each and every respondent that an analyst can use to aggregate in anyway is needed for his/her purposes and to cross-tab. From Eurostat website we could access only data in the way Eurostat statisticians decided to aggregate the micro-data. Access to Eurostat micro-data are not automatically open and requires to place a request through procedures that can last up to 18 months. [↑](#footnote-ref-72)
73. The Applica study is actually references (with the following url: <http://circa.europa.eu/Public/irc/dsis/health/library?l=/reports/disability/analysis_eu-silc1pdf/_EN_1.0_&a=d> ) as a key annex in the page describing the main parameters of the LFS 2002 (<http://epp.eurostat.ec.europa.eu/cache/ITY_SDDS/en/hlth_empdis_esms.htm>) [↑](#footnote-ref-73)
74. In doing so, since LFS 2002 does not report the prevalence for the age group 65 and older, to generate the equivalent data for this group we could either apply the LFS 2002 parameter for the group 50-64 or use the EU-SILC 2009 data on prevalence for the group 65 and older. We know that the first to some extent underestimates the 65 and older (given that the prevalence of disabilities and their relevance for everyday life tend to increase for ages above 65), whereas the latter would to a greater extent over-estimate them (for the reasons explained earlier). In addition, using the latter would create further bias due to mixing up data coming from different years, so we opted again conservatively for the first choice. See for instance <http://www.w3.org/WAI/bcase/soc.html> [↑](#footnote-ref-74)
75. See for instance <http://www.w3.org/WAI/bcase/soc.html> [↑](#footnote-ref-75)
76. For a review of this field see for instance Khandker et al. (2010). [↑](#footnote-ref-76)
77. They cite three of them that we gathered and analysed but were able to find only two additional ones (besides naturally a wide range of anecdotal evidence some of it is cited in the next chapter on key aspects). [↑](#footnote-ref-77)
78. One shot cross-sectional data for only one point in time can serve the purpose of establishing the existence of a correlation but not to infer causal parameters. [↑](#footnote-ref-78)
79. As explained in Annex I, EU-SILC provides data on the prevalence of disability for all EU27 but it does so by clearly overestimating the phenomenon, it does not provide more information on the type of disability, it does provide data on the socio-economic situation of PwD. On the contrary the 2002 ad hoc module of the Labour Force Survey by Eurostat provides all of this more granular information but only in a one year cross-sectional shot. [↑](#footnote-ref-79)
80. See sources cited in §5.2.1 (Evans 2007; Kemper et al 2010; Mont & Loeb 2008; PBA 2007; Rein et al 2006; Taylor et al 2006;). Some of the components of this key aspect are mentioned also in Work Research Centre (2008) and EBU (2008). [↑](#footnote-ref-80)
81. See sources cited in §5.2.1and in §5.2, as well as illustration in §5.3.1 of Annex V. Among additional practitioners sources not cited there see: EBU (2008), Forrester (2003), McKinsey (2003), Moulton et al (2002), RNIB (2008). [↑](#footnote-ref-81)
82. See sources cited in §5.2.1. Among additional practitioners sources not cited there see EBU (2008) and Work Research Centre (2008). As increase in wages is assumed to be rewards for increased productivity see Forrester estimates of how many workers could increase their productivity due to increased accessibility (2003). Also on increased productivity see EBU (2008) and Work Research Centre (2008). [↑](#footnote-ref-82)
83. See sources cited in §5.2.1. [↑](#footnote-ref-83)
84. See sources cited in §5.2.1, illustration in §5.3.3 of Annex V to this report, and Annex III of Deliverable D2 [↑](#footnote-ref-84)
85. See sources cited in §5.2.1 in the discussion of consumer welfare, as well as illustration in §5.3.4 of Annex V. [↑](#footnote-ref-85)
86. But see a recent report delivered for the Commission on the charges applied by banks to consumers for current accounts (Van Dijk Management Consultants 2009) [↑](#footnote-ref-86)
87. See sources cited in §5.2.1 in the discussion of consumer welfare, as well as illustration in §5.3.5 of Annex V. [↑](#footnote-ref-87)
88. See EBU (2008), Forrester Research (2003); MIC ABU (2008); Neff et al (2009). [↑](#footnote-ref-88)
89. See sources cited in §5.2.1. [↑](#footnote-ref-89)
90. See sources cited in §5.2.1 in the discussion of the less tangible dimensions of the impact on private and social life. In addition see Davies et al (2001) and Pilling et al (2004). [↑](#footnote-ref-90)
91. See sources cited in §5.2.1 in the discussion of the less tangible dimensions of the impact on private and social life. In addition see Davies et al (2001) and Pilling et al (2004), Paciello (2000) Webcredible (2010b). [↑](#footnote-ref-91)
92. See sources cited in §5.2.1 in the discussion of the less tangible dimensions of the impact on private and social life. [↑](#footnote-ref-92)
93. See sources cited in §5.2.1in the discussion of the less tangible dimensions of the impact on private and social life. [↑](#footnote-ref-93)
94. Besides the sources already quoted in §5.2.1.2 (Heerdt & Strauss 2004; Henry & Arch 2009; Leitner & Strauss 2008; Leitner et al 2006; Millman, 2002; Slatin & Rush 2003; W3C 2009e), the following wide range of practitioners generated sources mentioned this aspect: CRG & IBM (2008), EBU (2008), EFoD (2006a and 2006b), Linctec (2010), Moss (2004), Rasberryfrog (2008), RNIB (2008), Thatcher et al (2006), TecAccessnet (2010), Webcredible (2010a and 2010b), Wilton & Howell (2007). [↑](#footnote-ref-94)
95. Besides the sources already quoted in §5.2.1.3 (Clark 2002, Leitner & Strauss 2008; Richards and Hanson 2004; Watanabe 2007; W3C 2009e), to which we must add here Henry & Arch (2009) and Heerdt & Strauss (2004), the following wide range of practitioners generated sources mentioned this aspect: CRG & IBM (2008), EBU (2008), EFoD (2006a and 2006b), Linctec (2010), McKinsey (2003), Moss (2004), Rasberryfrog (2008), RNIB (2008), Thatcher et al (2006), TecAccessnet (2010), Webcredible (2010b), Wilton & Howell (2007). [↑](#footnote-ref-95)
96. Accessibility decreases server loads (W3C, 2009e). [↑](#footnote-ref-96)
97. Accessibility enables content to work on different devices and eliminate the need for creating multiple versions of a site for different devices (Davies 2006, p. 2-4; Thatcher et al 2006). [↑](#footnote-ref-97)
98. Accessibility helps take advantage of advanced Web technologies and be prepared for future Web technologies without needs of future redesign (Clark2002; Cullen, et al, 2008, p. 6-7, 28; W3C, 2009e). [↑](#footnote-ref-98)
99. Mentioned in W3C (2009e), the following wide range of practitioners generated sources mentioned this aspect: CRG & IBM (2008), EBU (2008), EFoD (2006a and 2006b), Heerdt & Strauss (2004), Henry & Arch (2009), Leitner & Strauss (2008), Leitner et al (2006); Millman (2002), RNIB (2008), W3C (2009e), Work Research Centre (2008). [↑](#footnote-ref-99)
100. W3C (2009e). [↑](#footnote-ref-100)
101. Most authoritative source mention this aspect is W3C (2009e; Clark 2002, Leitner & Strauss 2008; Richards and Hanson 2004; Watanabe 2007; and also in Cullen et al 2008). [↑](#footnote-ref-101)
102. We mean incorporating accessibility into protocols and procedures, such as quality assurance (QA) testing and usability evaluation, which can take considerable personnel time (Clark, J., 2002; Cullen et al 2008, p.6-7, 28; Heerdt, & Strauss2004; Richards & Hanson 2004; W3C, 2009). [↑](#footnote-ref-102)
103. When redesigning an existing site, the evaluation of its initial level of Web Accessibility is a very common initial cost (Davies, 2006, pp. 2-4; Thatcher et al 2006). [↑](#footnote-ref-103)
104. Most authoritative source mention this aspect is W3C (2009e; Clark 2002, Leitner & Strauss 2008; Richards and Hanson 2004; Watanabe 2007; and also in Cullen et al 2008). [↑](#footnote-ref-104)
105. Purchase of software and/or online tools that identifies accessibility problems (W3C, 2009). [↑](#footnote-ref-105)
106. Purchase of assistive technologies to understand how people with disabilities interact with Web pages and to test Web pages. (W3C, 2009) [↑](#footnote-ref-106)
107. Sometimes organisations determine that it will be more efficient to implement accessibility with different technologies. For example, some organisations upgrade or change to a content management system (CMS) (EBU, 2008; Heerdt & Strauss, 2004). [↑](#footnote-ref-107)
108. Most authoritative source mention this aspect is W3C (2009e; Clark 2002, Leitner & Strauss 2008; Richards and Hanson 2004; Watanabe 2007; and also in Cullen et al 2008). [↑](#footnote-ref-108)
109. Most authoritative source mention this aspect is W3C (2009e; Clark 2002, Leitner & Strauss 2008; Richards and Hanson 2004; Watanabe 2007; and also in Cullen et al 2008). [↑](#footnote-ref-109)
110. Testing of new design ideas and early prototypes with users with disabilities and older users, using assistive technologies [↑](#footnote-ref-110)
111. An organisational profile to represent employees and their views to senior management (W3C, 2009). [↑](#footnote-ref-111)
112. Among IT department personnel (W3C, 2009). [↑](#footnote-ref-112)
113. Provide clarity (simplicity) for suppliers on how to implement accessible ICT and ensure they respect accessibility standards in their delivery. [↑](#footnote-ref-113)
114. Besides the sources already quoted earlier (Heerdt & Strauss 2004; Henry & Arch 2009; Leitner & Strauss 2008; Leitner et al 2006; Millman, 2002; Slatin & Rush 2003; W3C 2009e), the following wide range of practitioners generated sources mentioned this aspect: CRG & IBM (2008), EBU (2008), EFoD (2006a and 2006b), Linctec (2010), Moss (2004), Rasberryfrog (2008), RNIB (2008), Thatcher et al (2006), TecAccessnet (2010), Webcredible (2010a and 2010b), Wilton & Howell (2007). [↑](#footnote-ref-114)
115. Besides the sources already quoted earlier (Heerdt & Strauss 2004; Henry & Arch 2009; Leitner & Strauss 2008; Leitner et al 2006; Millman, 2002; Slatin & Rush 2003; W3C 2009e), the following wide range of practitioners generated sources mentioned this aspect: CRG & IBM (2008), EBU (2008), EFoD (2006a and 2006b), Linctec (2010), Moss (2004), Rasberryfrog (2008), RNIB (2008), Thatcher et al (2006), TecAccessnet (2010), Webcredible (2010a and 2010b), Wilton & Howell (2007). A separate mention is worth here of the study by Watanabe, (2007, p. 6). The author performed systematic empirical test showing that accessible Websites reduce search and navigation by 50% and that this increase the number of completed online eCommerce transaction. [↑](#footnote-ref-115)
116. See EBU (2008), Forrester (2003), MIC ABU (2008), Neff et al (2009), and Work Research Centre (2008). [↑](#footnote-ref-116)
117. This aspect is mentioned in passing by several sources but the two where the argument is more developed are CRG & IBM (2008) and McKinsey (2003). The issue is also mentioned in various section of the EFoD’s Website, but the most important aspects are in the McKinsey report (2003) that was delivered as part of pro bono activities exactly for EFoD [↑](#footnote-ref-117)
118. Mentioned in CRG & IBM (2008), EBU (2008), EFoD (2006a and 2006b), Heerdt & Strauss (2004), Henry & Arch (2009), Leitner & Strauss (2008), Leitner et al (2006); Linctec (2010), Millman (2002), Moss (2004), Rasberryfrog (2008), RNIB (2008), TecAccessnet (2010), Webcredible (2010b), W3C (2009e). [↑](#footnote-ref-118)
119. Mentioned in CRG & IBM (2008), EBU (2008), EFoD (2006a and 2006b), Heerdt & Strauss (2004), Henry & Arch (2009), Leitner & Strauss (2008), Leitner et al (2006); Linctec (2010), Millman (2002), Moss (2004), Rasberryfrog (2008), RNIB (2008), TecAccessnet (2010), Webcredible (2010b), W3C (2009e). [↑](#footnote-ref-119)
120. Information Society and Media DG Office (2008) TV, online, on-demand Modern Rules for Audiovisual Europe Factsheet <http://ec.europa.eu/avpolicy/reg/tvwf/index_en.htm> [↑](#footnote-ref-120)
121. See Chan, Wong, Lee, & Chi (2009 p.156-157); Law Office of Lainey Feingold (2010); Neerincx, Cremers, et al. (2008, p. 1); Frieden (2006); Asawa, Ohta & Ando (2005, p.93). [↑](#footnote-ref-121)
122. McDaid (2008, p.8). [↑](#footnote-ref-122)
123. See Gill (2009); RNIB Digital Accessibility Team “Tiresias” (2009) [↑](#footnote-ref-123)
124. For instance, in 2003 it was estimated that a third of the USA's 120.000 polling places were not fully accessible (RNIB Digital Accessibility Team “Tiresias”, 2009). [↑](#footnote-ref-124)
125. See Frieden (2006) [↑](#footnote-ref-125)
126. See Frieden (2006) [↑](#footnote-ref-126)
127. See Yanez & Gomez (2004, p. 8). [↑](#footnote-ref-127)
128. See Yanez & Gomez (2004, p. 8); Frieden (2006); European Commission (2008b, p. 66, 69); Law Office of Lainey Feingold (2010). [↑](#footnote-ref-128)
129. See Yanez & Gomez (2004, p. 8); European Commission (2009b, p. 2- 3); Gill (2004a, p. 4); McGookin, Brewster, & Jiang (2008, p.1); Gill (2004b, p.14b); Gill (2009a) [↑](#footnote-ref-129)
130. Biometrics permits the automatic identification of an individual based on his or her distinguishing physiological and/or behavioural characteristics. Biometric identification involves comparing with a database of templates to find out who you are, but biometric verification is where the template is compared to the one supplied with your claimed identity. Some biometric systems cannot do identification but can only verify the claimed identity of a person (Gill, 2009a) [↑](#footnote-ref-130)
131. ONCE Foundation has conducted an experimental study of the potential of the mobile phone as a terminal able to interact with automated teller machines, setting up a secure wireless communication between the user’s mobile phone and the ATM. [↑](#footnote-ref-131)
132. Adaptable user interfaces (with user’s preferences stored on a smartcard) have been standardised by the European Committee for Standardization (CEN) in the document “Identification Card Systems - Man-Machine Interface - Part 4: Coding of user requirements for people with special needs. (EN 1332-4); this coding system is applicable to a wide range of devices including computer terminals in public libraries and public transport information terminals (Gill, 2009b) [↑](#footnote-ref-132)
133. See La Caixa (2009, p.2, 4); Frieden (2006); European Commission (2008a); Gill (2009b) [↑](#footnote-ref-133)
134. See Frieden (2006); Gill (2009b) [↑](#footnote-ref-134)
135. See Chan et al. (2009 p.157) [↑](#footnote-ref-135)
136. See La Caixa (2009, p.7); Gill (2009b, p.8). [↑](#footnote-ref-136)
137. See European Commission (2009b, p.3, 4); Gill (2009 p. 9-10); European Commission (2007c, p.15; 89-90); European Commission (2007a, p. 158); Law Office of Lainey Feingold (2010). [↑](#footnote-ref-137)
138. See <http://www.direct.gov.uk/en/DisabledPeople/Employmentsupport/LookingForWork/DG_4000314> [↑](#footnote-ref-138)
139. <http://www.weforum.org/documents/GITR10/index.html>, page 12 [↑](#footnote-ref-139)
140. <http://ec.europa.eu/enterprise/policies/sme/facts-figures-analysis/sme-definition/index_en.htm> [↑](#footnote-ref-140)
141. http://ec.europa.eu/enterprise/policies/sme/facts-figures-analysis/sme-definition/index\_en.htm [↑](#footnote-ref-141)
142. Global Information TechnologyReport (GITR). <http://www.networkedreadiness.com/gitr/main/fullreport/index.html> [↑](#footnote-ref-142)
143. This company requested anonymity. [↑](#footnote-ref-143)
144. Due to the impossibility of gathering more responses for Cluster 2, another financial company was interviewed for Cluster 3. [↑](#footnote-ref-144)
145. Due to the lack of general awareness of the eAccessibility topic and the low number of accessible websites in these countries (Latvia, Slovak Republic, Greece, Romania, Poland and Bulgaria), Cases Studies prepared for Cluster 4 are miscellaneous and could not be classified as in the other clusters. [↑](#footnote-ref-145)
146. <http://ec.europa.eu/eurostat/ramon/nomenclatures/index.cfm?TargetUrl=LST_NOM_DTL&StrNom=NUTS_33&StrLanguageCode=EN&IntPcKey=&StrLayoutCode=HIERARCHIC> [↑](#footnote-ref-146)
147. These effects should be stronger the more skilled labour is complementary with ICT capital (see Krusell et al, 2000). [↑](#footnote-ref-147)
148. The same type of approach is followed in all subsequent projections. [↑](#footnote-ref-148)
149. Notice that the values for the wages observed in 2006 are given for slightly different age intervals: the Structure of Earnings Survey considers the following age classes: less than 30, 30-39, 40-49, 50-59. We have chosen to apply the average wage reported by the 2006 SES for the less than 30 age group to the relative wages estimated by EU-SILC for the 16-39 age group, the average wage reported by SES for the 40-49 group to the EU-SILC relative wage for the age interval 40-54 and finally, the average wage reported by SES for the 50-59 age group to the EU-SILC relative wages for the age group 55-64. The age-group matching between the two dataset is not perfect but we do not think that this has a relevant impact on our computations. [↑](#footnote-ref-149)
150. In order to obtain yearly figures we multiply monthly wages by 12. [↑](#footnote-ref-150)
151. It should also be pointed out that the 10 percentage point discrepancy in wages between those who report some LSHPD and those who don’t, estimated ceteris paribus, might also be partially attributable to some unobserved factor reducing the productivity of workers suffering from a LSHPD. In our exercise we implicitly rule out this possibility. [↑](#footnote-ref-151)
152. This is given by the difference between the country-specific life expectancy and the age-group specific mean age: for instance, if, in Belgium, life expectancy is 78.83 years, the expected remaining number of years for someone in the age group 16-24 is 58.83. [↑](#footnote-ref-152)
153. When, for a given country, a value is not available for a weight, we use the cluster-specific average. [↑](#footnote-ref-153)
154. We are aware that some may consider the choice of using only 12 of PwD as the base target for this benefit a bit conservative. It may be also possible that PwD who have access are still facing web accessibility problems, but we had no way to base this claim. Moreover, we are already assuming that, if Web Accessibility improves, PwD will all engage in eCommerce and eGovernment, which we know is not always the case, because of all the debate about the conversion rates. Therefore using the 12% gap, may underestimate the overall target, but on the other hand is already optimistic enough to assume that this gap is completely closed and as a result of increased web accessibility all of these PwD start buying only. Therefore, we stayed on the conservative side of using this target instead of all the PwD, to offset the assumption (optimistic) that as soon as web accessibility improves all PwD becomes online shoppers. [↑](#footnote-ref-154)
155. This value has been estimated by the Study Consortium comparing average usage of e-banking among people with and without disabilities. [↑](#footnote-ref-155)
156. Data on hourly average and minimum wages are taken from Empirica (2008). [↑](#footnote-ref-156)
157. This might be an underestimation if PwD already using Internet, due to low accessibility are not able to use eCommerce functionalities as much as they would like to. [↑](#footnote-ref-157)
158. The current NUTS classification valid from 1 January 2008 until 31 December 2011 lists 97 regions at NUTS 1, 271 regions at NUTS 2 and 1303 regions at NUTS 3 level. <http://epp.eurostat.ec.europa.eu/cache/ITY_OFFPUB/KS-RA-07-020/EN/KS-RA-07-020-EN.PDF> [↑](#footnote-ref-158)
159. NUTS 2 refer to macro-regions, which in many countries do not exist. In any case, we have assumed a value of 1 website for every macro-region. [↑](#footnote-ref-159)
160. This is important since yearly revenues must be compared to yearly costs for all the relevant periods, while set up costs should be considered only for the first period. [↑](#footnote-ref-160)
161. This might be an overestimation of the websites that are of more relevance for people with a LSHPD, since many firms are more oriented towards other firms than to consumers. Still we decided to use the whole universe of firms. [↑](#footnote-ref-161)