Technology Uptake: Architecture

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Failing to couple hardware, software, and applications.
The coupling of the critical elements for success must happen early and often. The hardware architects, the operating and tool developers, and the scientific end users must all be engaged from the beginning, to provide the critical feedback needed for true innovation.

NCSA Users over Time by Architecture
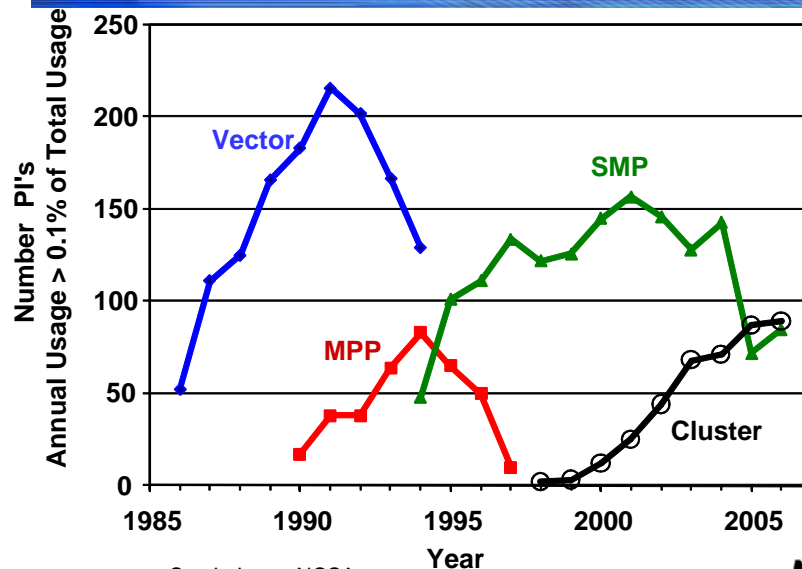
Src: L. Lane, NCSA

## Designing Communities as Small World Networks

- Industries with small world network structures are more innovative and effective
  - Networks where people spend most of their time communicating with one another in a group ("cluster") and spend some time communicating with others outside ("short cuts")
  - Small world networks exhibit high levels of "clustering" and few "shortcuts"
    - Clusters engender trust and control, maximize capability for exploitation
    - Shortcuts engender unique combinations of network resources, maximize capacity for exploration
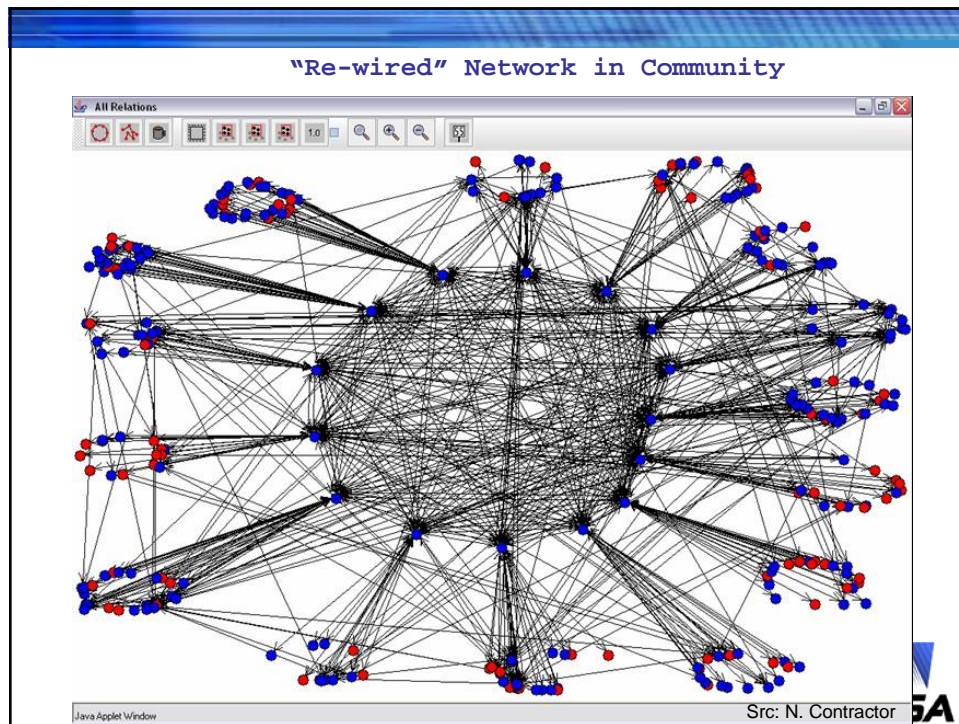
Src: N. Contractor

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"Pre-wired" Network in a Community

Src: N. Contractor

"Re-wired" Network in Community
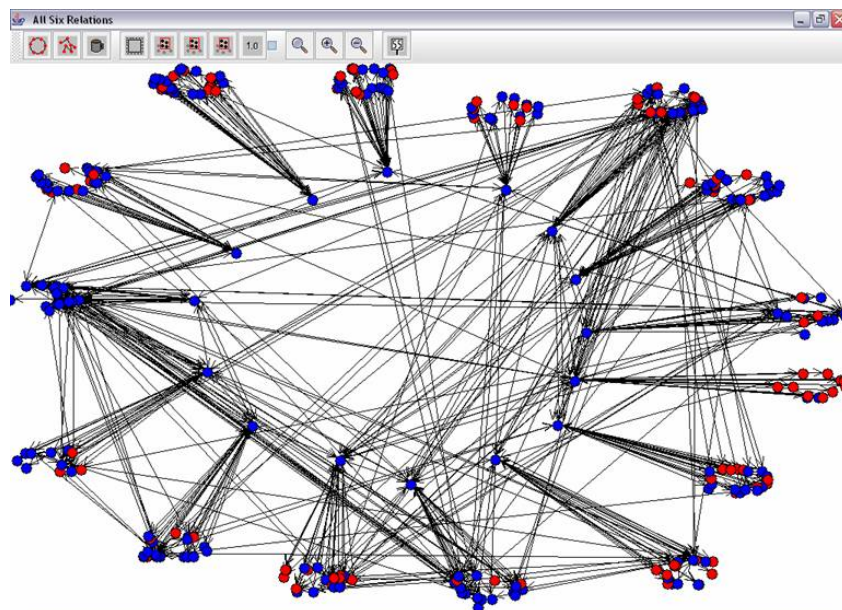
Src: N. Contractor

Re-wiring the Community's Network

- Increase the likelihood to give and get information to the right target and source respectively
- Benefits for Community
  - Increase absorptive capacity
  - Reduce number of steps for diffusion
- Costs for Community
  - Increase communication links of network leaders from
  - Increase criticality of network leaders

- GOAL
  - Decrease the uptake time and increase the acceptance of the research community

Src: N. Contractor

PIs on NCSA Cluster Systems

0.001% level represents:
2000 – 15 NU
2003 – 360 NU
2006 – 8,000 NU

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