

Integration, complexity & Risk

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Background

- CARR
- Control to Drift follow-up
- LSE-Oslo project: Integration and The Duality of Risk
- Exploring “new risks”
- Book: Complexity, Risk & ICT

Complexity and Risk

- BCS&RAE: The Challenges of Complex IT Projects
 - <http://www.bcs.org/NR/rdonlyres/3B36137E-C5FE-487B-A18B-4D7281D88EF7/0/complexity.pdf>
- Situation today:
 - High failure rates, “best practices” not adopted
 - Growing complexity
 - Old methods have not scaled, new ones have not emerged
 - Understand it
 - Manage it: Risk Management

Complexity

- Complexity = number of types of components * number of types of links * speed of change
- Dramatically increased SOCIO-TECHNICAL COMPLEXITY: integrating technologies, users, organizations, work practices, ...

Theories of Complexity (and Risk)

- Risk Society/Reflexive Modernization
- Complexity Sciences
- Actor-Network Theory
- Propagation of (un-intended) side-effects

Risk Society/Reflexive Modernization

- Globalization
- Risk = unpredictability = side-effect
- Environment: global warming, biotech
- Propagation of side-effects: domino-effects – boomerang effects
- Self-destructive
- More integration => More risk!
- "Non-knowledge is the engine of change"

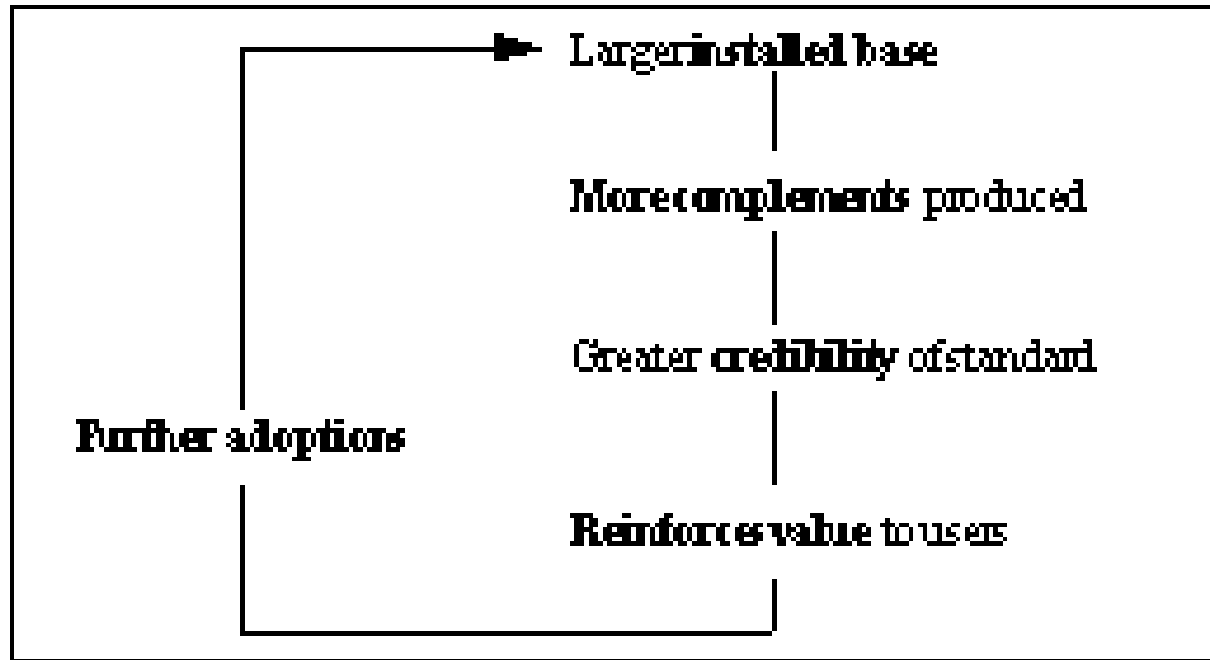
Complexity Sciences

- Complexity Sciences: CAS; Chaos Theory, ...
- Cells making a body, molecules making a liquid, ..
- Autonomous, self-organized, learning oriented, open
- Emergent orders
 - Attractors
 - Positive feed-back
- Non-linearity
- Driver of change and learning: variety - "Order at the edge of chaos"
- Destroyed if tried controlled/redesigned from above/outside

Standardization

- “The economy as evolving complex systems,” the emergence of standards
- Network externalities (=side-effects)
- Increasing returns
- Path dependency
 - Diffusion of standards
 - Change of standards: Backward compatibility
 - Chain of events
- Lock-in

A self-reinforcing installed base



Actor-Network Theory

- Heterogeneous networks: humans and non-humans, technological and non-technological components
- Fluids: changing and staying the same
- Order's dis-order (side-effects)

Complex technologies in Organization Studies

- Perrow: Normal Accidents Theory
 - Tight couplings and interactive complexity
- LaPorte (Weick): High Reliability Organizations
 - Focus on risks
 - Learning from experience
- Who is correct?
- The limits of knowledge and learning
- Giddens/Back: More knowledge may lead to less control

Reflexivity: Global Bank

- System risks, “near disaster”
- Ongoing growth and integration
- Variety of e-mail systems, services, practices
- E-mail: from instant messaging to business critical archive
- One integrated e-mail system, one integrated and centralized support organization
- Integration of cultures?
- Bank Holiday Shutdown
 - The system didn’t boot: too much e-mail
 - Booting locally, restoring back-ups
 - Access rights: full rights to everybody
 - Global access to sensitive information
 - Booted after a week

Reflexive Integration: Electronic Patient Records

- Aim: One integrated, standardized EPR, decrease patient risks
- Trying to make a standard – killed it
 - Integrated with Siemens, globalized the project
- Trying to get rid of paper – more paper
 - After 8 years: 20-30% of info electronic
 - Lots of “air” in printouts
 - Electronic lab reports – up to 14 paper copies
- Trying to integrate IS – fragmentation
 - From 5 to 134 “EPR systems”
 - IVF: mother & child, specialist systems, instruments, ...
- Trying to integrate patient records – more fragmentation
- Patient risks?

Reflexivity: Mobile Phone Billing

- Australian company went bankrupt
- Rapid growth and change over many years
 - Customers, employees, services, telecom infrastructure, IT infrastructure, ISs, ..
 - Going global: expatriates
- Consultancies, outsourcing
- Communication
 - Matrix
 - More consultancies: mixture of methods, hiding info.
- Risk Management
 - Many risks .. To many: complex system in itself
 - Avoiding blame
 - “Risk Shuffling” (distribution of “bads”)

Could the risks have been managed?

- Predicted?
- Would "best practise" make a difference?
 - Spiral model/prototyping?

High Reliability Organizations?

- Learning?
 - EPR: More integration
- Will experience do it?
- Or “institutionalized irresponsibility”?