

Innovation and Creativity in Organizations

Management of Innovation

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DYN 692

Fall 2007

Creativity and Innovation in Organizations: Core Topics

- 1. Introduction: Techniques for group innovation/ Participative Course Design
- 2. The Creative Process (Csikszentmihalyi)
- 3. Creativity within Organizations
- 4. Innovation in Organizations (Case INEX, Issue-selling)
- 5. Process & Dynamics of Innovation
- 6. Management of Innovation

Management of Innovation

- **Established Organizations and Innovation**
 - (Gunfire at Sea, Adaptive Eyecare)
- **Individual Contributions**
- **Technical Communication**
- **Intra-Organizational Networks**
- **Inter-Organizational Networks**

Established Organizations and Innovation

- Established organizations are locked into a dominant design
- Its departments, career paths, customer base and suppliers share in the dominant design that has become the standard
- Dilemma of being entrapped by tangible and intangible, mindsets and values, whose platform you need to move on

Gunfire at Sea

- What is meant by “They are holding the horses”? Why gunnery as case study?
- What was Sims’ motivation? How did this motivation differ from Scott’s
- Why did the Navy resist Sims’ efforts? Identify some core rigidities
- What remedies?

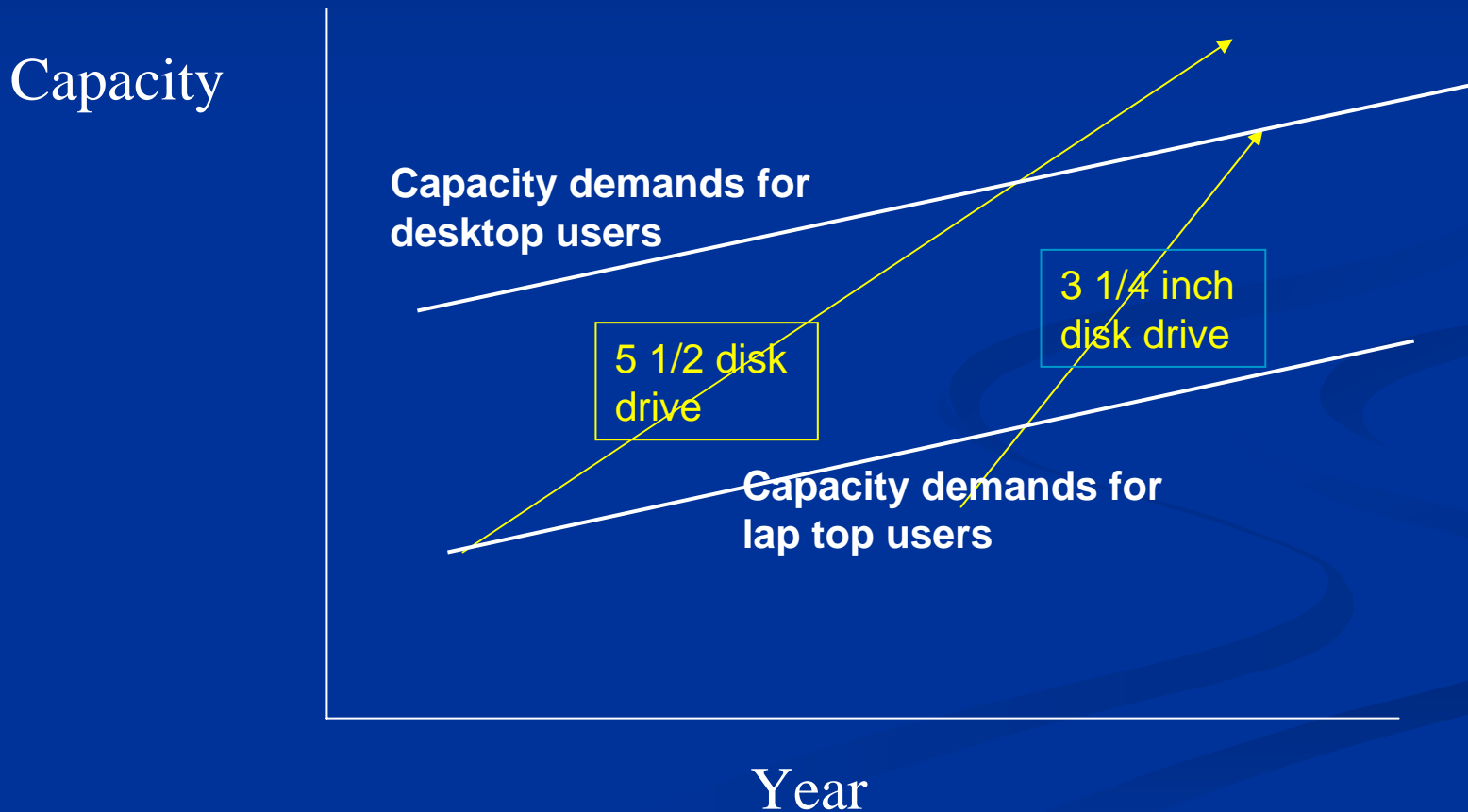
Gunfire at Sea: Take-Away

- Innovation not due to R&D but creative use of existing technology
- Continuous aim gunfire due to a chance event and a driven person who was maverick, prepared to break rules
- Tyranny of past success entraps the organization (core rigidities)
- Resistance to change is “society”-wide
- Role of leadership in unlocking system

Christensen: Innovator's Dilemma (1997), Innovator's Solution (2004)

- Keeping close to customers – sometimes to the fatal end
- Sustaining vs. Disruptive Technologies (increased rate vs. redefined performance trajectory)
- Established vs. Entrant Firms (founded before vs. after advent of the technology)

Same technology, new dominant design, meeting different needs is *disruptive technology*



Individual Contributions

Innovation is:

- **Best motivated from the inside out**
- **Guided by roles in the organization**
- **A product of work strategies**
- **Facilitated by dissent**

Amabile (1988) A model of creativity and innovation in organizations

- **Individual creativity is key to the innovation process (production of novel and useful ideas)**
- **Intrinsic vs Extrinsic Motivation (internal vs external factors that motivate creativity)**
- **Creativity Intersection (resources, techniques, and motivation)**

Roberts & Fusfeld (1981) *“Staffing the innovative technology-based organization”*

■ Innovation Process

- 1. preproject, 2. possibilities, 3. initiation,
- 4. execution, 5. outcome evaluation, 6. transfer

■ Critical Functions

- 1. idea generating, 2. entrepreneuring/championing,
- 3. project leading, 4. gatekeeping,
- 5. sponsoring/coaching

■ Multiple Roles & Career-Spanning Role Changes

- (more than one critical function at different stages in career)

Kelley & Caplan, 1993

“How Bell Labs creates star performers”

■ Expert Work Strategies

- taking initiative, networking, self-management, teamwork effectiveness, leadership, followership, perspective, show-and-tell, organizational savvy

■ Training Knowledge Professionals

- implement productivity enhancement groups

■ Differential Returns

- woman and minorities benefited even more

Nemeth (1997) *“Managing innovation: When less is more”*

- **Social Control vs Innovation**
 - execution vs going out on a limb
- **Majority vs Minority Status**
 - conformity vs dissent toward norms
- **Integrating Healthy Disagreement**
 - open doors for innovation opportunities

Shapero (1985) *“Managing creative professionals”*

- **Environment for Creativity**
 - tolerating deviance from the norm
- **Process of Creating**
 - preparation, incubation, illumination, verification
- **Creative Problem Solving**
 - 1. soak self in problem, 2. play with problem, 3. suspend judgment, 4. come up with two solutions, 5. repeat as necessary

Technical Communication

Innovation:

- Is fostered in R&D labs
- Is driven by scientists and engineers
- Requires organizational boundary roles
- Benefits from technical communication

Allen (1977) *“Managing the flow of technology”*

- • **Scientists vs Engineers**
 - learning for learning’s sake vs professional preparation) •
- **Science vs Technology**
 - literature-based knowledge vs firm-based knowledge)
- **Gap-Filling Science**
 - reduce delay of technical communication between science and technology

Tushman (1977) *“Special boundary roles in the innovation process”*

■ Boundary Roles

- link internal network to external sources of information

■ Internal Communication Stars

- consulted most frequently on technical matters

■ Two-Step Process

- technical staff communicate with internal stars, who in turn communicate outside of the organization

Ebadi & Utterback (1984)

The effects of communication on technological innovation

- **Researcher Communication**
 - higher individual frequency of communication across projects associated with greater project success
- **Project Centrality**
 - higher project centrality scores associated with greater project success

Pelz & Andrews (1966) *Scientists in organizations: Productive climates for research and development*
– Chapter 3: Communication

■ **R&D Labs**

- **services/equipment or interacting scientists?**

■ **Effective Scientists**

- **sought and received more contact with colleagues (Controlling for experience, supervisory status, PhD, and lab type)**

Sosa, Eppinger, et al. (2002) *“Factors that influence technical communication in distributed product development”*

■ Communication Drivers

- interdependence, organizational bond

■ Communication Barriers

- physical distance, *overlapping time*, *cultural differences*

■ Communication Media

- preferences shift depending on physical distance

Intra-Organizational Networks

Innovation:

- can arise through structural holes
- is transferred through informal networks
- can arise through weak ties
- often requires change in social structure

Burt (1992) Structural Holes

Ch.1, The social structure of competition

■ Network Benefits

- information – access, timing, referrals
- control – tertius gardens, entrepreneurial motivation

■ Structural Holes

- separation between non-redundant contacts

■ Competition

- players with structural holes have higher rate of return

Krackhardt & Hanson (1993)

“Informal networks: The company behind the chart”

- **Informal Networks vs Formal Networks**
 - naturally-occurring ties vs reporting relationship ties
- **Three Types of Networks**
 - advice, trust, communication
- **Implementing Change**
 - identify key players using a network map

Constant, Sproull, & Kiesler (1996)

“The kindness of strangers: The usefulness of electronic weak ties for technical advice

■ **Weak Ties**

- relationships with acquaintances or strangers

■ **Electronic Communication**

- can facilitate access to useful technical advice

■ **Organizational Motivation**

- important for increasing likelihood of help from a request

Gargiulo & Benassi (2000)

Trapped in your own net? Network cohesion, structural holes, and the adaptation of social capital

- **Network Closure vs Structural Holes**
 - cohesive ties vs non-redundant ties
- **Tradeoff: safety from cohesiveness vs flexibility from 'holes'**
- **Adapting to Change: managers with structural holes had an easier time adjusting**

Inter-Organizational Networks Innovation:

- may result from a more open process
- can be sparked by knowledge brokers
- often resides in networks of firms
- is one product of strategic alliances

Wolpert (2002) *Breaking out of the innovation box*

- **Open Innovation will be more Sustainable in the long run**
- **Investment in Innovation follows Boom-Bust Cycle**
- **Network of Intermediaries (third-party companies that facilitate exchange of information)**
- **Intermediary Candidates (IBM alphaWorks, Xerox alphaAvenue, baby boomer retirees)**

Hargadon (1998)

Firms as knowledge brokers: Lessons in pursuing continuous innovation

Knowledge Brokers

- firms that span multiple markets and technology domains
- Example Firms: IDEO, Design Continuum, Andersen, McKinsey & Co., HP, Boeing, Edison & Co., Elmer Sperry, Synectics
- Innovation Activities (access, learning, linking, implementation)

Powell, et al (1996) *Interorganizational collaboration and the locus of innovation: Networks of learning in biotechnology*

- **Locus of Innovation Resides in Networks rather than Firms (biotechnology industry)**
- **Network Examples (R&D, outside investors, clinical trials/evaluation, manufacturing, marketing/licensing, supply/distribution, investment/join venture)**
- **Experience and Centrality in Network Related to Success (relevant knowledge is widely distributed – outside of firm)**

Stuart (1998) *Network positions and propensities to collaborate: An investigation of strategic alliance formation in a high-technology industry*

- **Positions of Firm Associated with Propensity to Collaborate (high-technology industry)**
- **Strategic Alliances (contractual asset pooling or resource exchange agreements)**
- **Formation of Alliances Predicted by: (crowding – technological segments with many active firms) (prestige – track record of developing seminal inventions)**