

Sample Definitions of Innovation

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Entovation International (1995)

1. "The three stages in the process of innovation: invention, translation and commercialization."

Bruce D. Merrifield, *"Forces of Change Affecting High Technology Industries."*

2. "Creative management is much the same as the first element of a creative and innovative act - new ways. Creative management consists of new ideas, new directions, new methods and new modes of operation. Innovative management is involved with those innovation processes that implement creative ideas and move successfully in new directions."

Robert Lawrence Kuhn, *Generating Creativity and Innovation in Large Bureaucracies*, Quorum Books (1993).

3. Invention: the power of inventing or being invented; ingenuity or creativity; something originating in an experiment

Innovation: the act or process of innovating; something newly introduced, new method, custom, device, etc; change in the way of doing things; renew, alter.

Webster's New World Dictionary, Second College Edition (1982)

4. "An invention is an idea, a sketch or model for a new or improved device, product, process or system...An innovation in the economic sense is accompanied with the first commercial transaction involving the new product, process, system or device, although the word is used to describe the whole process."

Christopher Freeman, *The Economics of Industrial Innovation*, The MIT Press (1982)

5. 6 Stage (innovation) Process for Simultaneous Engineering: 1. Concept (including inventor); 2. Technical Feasibility; 3. Development; 4. Commercial Validation & Production Preparation; 5. Full-Scale Production; and 6. Product Support.

National Society for Professional Engineers (1990)

6. "It has long been assumed that product innovations are typically developed by product manufacturers...innovators (with)...major influence on innovation research, on management of research and development and government innovation policy...

"series of studies showing that the sources of innovation vary greatly...test some implications of replacing the manufacturer-as-innovator assumption with the view of the innovation process as predictably distributed across users, manufacturers, suppliers and others."

Eric von Hippel, *The Sources of Innovation*, Oxford University Press (1988)

7. 11 Elements of Innovation Competence: 1. Design/embodiment of technology; 2. Production systems/organization; 3. Skills (labor, managerial, technical); 4. Materials/supplier relations; 5. Capital equipment; 6. Knowledge and experience base; 7. Relationship with customer base; 8. Customer applications; 9. Channels of distribution and service; 10. Customer knowledge; 11. Modes of customer communication.

William J. Abernathy and Kim B. Clark, *Innovation: Mapping the Winds of Creative Destruction*, *Readings in the Management of Innovation*, Ballinger Publishing Company (1988)

8. The Origin of Innovation: "innovation is the result of 1) a shock (a major failure) to the system, 2) problemistic search, 3. random variability in experimentation, 4) deliberate decision to invest in learning, 5) match between a need and ideas which already exist, 6) formal vehicles for stimulating innovation such as research and development, 7) managerial risk seeking or risk

averse behavior, 8) availability of slack resources, 9) management philosophy and organizational climate, and 10) customer needs."

Yuri Ijuri and Robert Lawrence Kuhn, *New Directions in Creative and Innovative Management: Bridging Theory and Practice*, Ballinger Publishing (1988)

9. Phases of Growth:
- I. Entrepreneurial; divergent; inventive; creative; exploratory
 - II. Management; duplication; modification; improvement; commonality/likeness
 - III. Shared leadership; divergence and innovation; sharing and integrating differentness; partnering/vision

"Innovators can hold a situation in chaos for long periods of time without having to reach a resolution...won't give up...have a long term commitment to their dream...innovators introduce a maximum of tension into the thinking process, unifying concepts that often appear to be opposed, solving problems which appear impossible."

George Land and Beth Jarman, *Breakpoint and Beyond: Mastering the Future Today*, Harper/Collins Publishers (1992)

10. This (innovation) life cycle is an S-shaped logistic curve consisting of three distinct phases: emergence (the development of the product or service, its manufacturing capabilities, and its place in the market), growth (where the product family pervades the market). and maturity (where the market is saturated and growth slows).

William G. Howard, Jr. and Bruce R. Guile, *Profiting from Innovation*, The Free Press (1992)

11. "The major role of this new group of (Post World War II) managers was innovation, the exact antithesis of machinelike behavior. The idea of a corporation as an organism was harder to discredit. To be regarded as the brain of the corporation had a seductive appeal. But the brain proposes; the body, other human beings, and the environment taken together dispose.

"An organization is (1) a purposeful system that is (2) part of one or more purposeful systems, and (3) parts of which. people, have purposes of their own...three levels of purpose: societal, organizational and individual."

Russell L. Ackoff, *Creating the Corporate Future*, John Wiley and Sons (1981)

12. "Paper entrepreneurs - trained in law, finance, accountancy - manipulate complex systems of rules and numbers. they innovate by using the systems in novel ways: establishing joint ventures, consortia, holding companies, mutual funds; finding companies to acquire, 'white knights' to be acquired by, stock-index and commodity futures to invest in, tax shelters to hide in; engaging in proxy fights, tender offers, anti-trust suits, stock splits, leveraged buy-outs, divestitures; buying and selling notes, junk bonds, convertible debentures; going private, going public, going bankrupt.

"Product entrepreneurs - inventors, design engineers, production engineers, production managers, marketers, owners of small businesses - produce goods and services people want. They innovate by creating better products at less cost; establishing more efficient techniques of manufacture, distribution, sales; finding cheaper sources of materials, new markets, consumer needs; providing better training of employees, attention-getting advertising, speedier consumer service and complaint handling, more reliable warranty coverage and repair.

"Our economic system needs both."

Robert Reich, *The Resurgent Liberal* (1989)

13. "Models that depict innovation as a smooth, well-behaved linear process badly misspecify the nature and direction of the causal factors at work. Innovation is complex, uncertain, somewhat disorderly, and subject to changes of many sorts. Innovation is also difficult to measure and demands close coordination of adequate technical knowledge and excellent market judgment in order to satisfy economic, technological, and other types of constraints - all simultaneously. The process of innovation must be viewed as a series of changes in a complex system not only of hardware, but also of the market environment, production facilities and knowledge and the social contexts of the innovation organization."

Central-Chain-of-Innovation (includes):

1. Invent and/or produce analytic design
2. Detailed design and test
3. Redesign and produce
4. Distribute and Market

Steven J. Kline and Gnathion Rosenberg, "*An Overview of Innovation*", *The Positive Sum Strategy*, National Academy Press (1986)

14. "Innovation cuts across a broad range of activities, institutions and time spans. If any part of the pipeline is broken or constricted, the flow of benefits is slowed. This is felt ultimately in lower productivity and lowered standards of living. In this sense, the cost of capital is crucial not only at the early stages of research and product development but also at the later stages when high-technology products are installed in production processes, in both manufacturing and service industries, as new tools to improve worker effectiveness."

James Botkin, Dan Dimancescu and Ray Stata, *The Innovators: Rediscovering America's Creative Energy*, Harper and Row (1983)

15. "Invention is the creation of a new device or process...Innovation is the introduction of change via something new."

William B. Rouse, *Strategies for Innovation*, John Wiley and Sons, Inc. (1992).

16. Matrix of the 4 types of Innovations: I. Architectural Innovation; II. Market Niche Innovation; III. Regular Innovation; and IV. Revolutionary Innovation.

W.J. Abernathy, *Industrial Renaissance*, Basic Books (1983)

17. Model of the Process of Innovation: 1. Recognition (technical feasibility and potential market demand), 2. Idea formulation (fusion into design concept and evaluation); 3. Problem-Solving (search, experimentation, and calculation; readily available information); 4. Solution (solution through invention; solution through adoption); Development (work out the bugs and scale up); 6. Utilization and Diffusion (implementation and use).

Donald G. Marquis, *"The Anatomy of Successful Innovations"*, Readings in the Management of Innovation, Ballinger Publishing Company (1988)

18. 3 Elements of Simultaneous (innovation) coupling: Research and Development; Manufacturing, Marketing.

J.R. Galbraith, *"Designing the Innovating Organization"*, Organizational Dynamics (1982)

19. "Continuous innovation occurs largely because a few key executives have a broad vision of what their organizations can accomplish for the world and lead their enterprises toward it. They appreciate the role of innovation in achieving their goals and consciously manage their concerns' value systems and atmospheres to support it."

James Brian Quinn, *"Innovation and Corporate Strategy: Managed Chaos"*, Technology in the Modern Corporation: A Strategic Perspective, Pergamon Press (1986)

20. " The term innovation has been defined in many different ways. However, these definitions can be broadly classified in two categories: those that see innovation as the final event - 'The idea, practice, or material artifact that has been invented or that is regarded as novel independent of its adoption or nonadoption' (G. Zaltman, R. Duncan and J. Holbeck, *Innovations and Organizations*, Wiley, 1973) and those who see it as a process 'which proceeds from the conceptualization of a new idea to a solution of the problem and then to the actual utilization of a new item of economic or social value.' (S. Meyers and D.G. Marquis, *Successful Industrial Innovations*. National Science Foundation, 1968). We adopt that latter definition...use the terms innovation and innovation process interchangeably."

Sumantra Ghoshal and Christopher A. Bartlett, *"Innovation Processes in Multinational Corporations"*, Harvard Business Review (1987)

21. 5 Stages of the Innovation Process: 1. Recognition; 2. Invention; 3. Development; 4. Implementation; and Diffusion.

Modesto A. Maidique, *"Entrepreneurs, Champions and Technological Innovation"*, Sloan Management Review (Winter, 1980)

22. Critical Functions in the Innovation Process: Idea Generating; Entrepreneuring or Championing; Project Leading; Gatekeeping; Sponsoring or Coaching.

Edward B. Roberts and Alan R. Fusfeld, "*Critical Functions: Needed Roles in the Innovation Process*," *Career Issues in Human Resource Management*, Prentice-Hall, Inc (1982)

23. 2 Linear Models of Technological Innovation:
 (1) Discovery - Applications Research - Development - Design - Utilization;
 (2) Need -Technology Research- Development - Design - Utilization.

"Linear models of technological innovation may be useful in describing key steps in the R&D process and in documenting projects after the fact, but are not particularly helpful in understanding the process in real time. Linear models can describe what happened but not how it happened, and tend to reinforce the belief in a kind of orderliness which does not exist."

Barbara Carlsson, Peter Keane and Bruce Martin, "*Learning and Problem Solving: R&D Organizations as Learning Systems*," *Sloan Management Review* (Spring 1976)

24. "Engineers say that a new idea has been 'invented' when it is proven to work in the laboratory. The 'idea' becomes an innovation only when it can be replicated on a meaningful scale at practical costs...In these terms, learning organizations have been invented, but they have not yet been innovated."

[Note: This is the linear view verses the systems dynamics view espoused throughout the book.]

Peter Senge, *The Fifth Discipline*, Doubleday Currency (1990)

25. "The literature on organizational innovation is rich in lessons...describes processes that are also prevalent in the natural universe. Innovation is fostered by information gathered from new connections; from insights gained by journeys into

other disciplines or places; from active, collegial networks and fluid, open boundaries. Innovation arises from ongoing circles of exchange, where information is not just accumulated or stored, but created. Knowledge is generated anew from connections that weren't there before."

Margaret J. Wheatley, *Leadership and the New Science*, Berrett-Koehler Publishers (1992)

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