

# ORGANIZATIONAL METHODOLOGY FOR INNOVATING PRODUCTS AND PROCESSES

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## ABSTRACT

Innovation in organizations is a complex issue. Innovation projects in most of the organizations are classified into two types, that is Product Innovation and Process innovation. Many organizations, especially in third world, are hesitant as far as product innovation is concerned and they follow the conventional styles. This study is aimed to describe different features on innovation process. It discusses the methodology of carrying out the innovation processes successfully and also describes how to avoid any failure in any innovation project of a product or a process.

**Keyword:** Innovation, product, process

## Introduction:

Innovation cuts across product and process technology and indeed, when considered in its broadest form, can include new organizational strategies and structures. Schroeder et al.(1986) have reviewed the field of industrial innovation and defined it as:

“The implementation of new ideas to change elements of manufacturing to produce results within a given organizational environment”.

Specifically, Sheroder et al. defined innovation in manufacturing as

The generation, evaluation, and implementation of new ideas to meet organizational objectives [...]

The application of new or different approaches or methods or technologies resulting in improved quality or reduced cost relative to competition [...]

Challenging the status quo, identifying opportunities and implementing non – obvious significant changes that meet or exceed the objective of the business.

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Figure 1 illustrates how, in over view; innovation can contribute to performance and competitiveness.

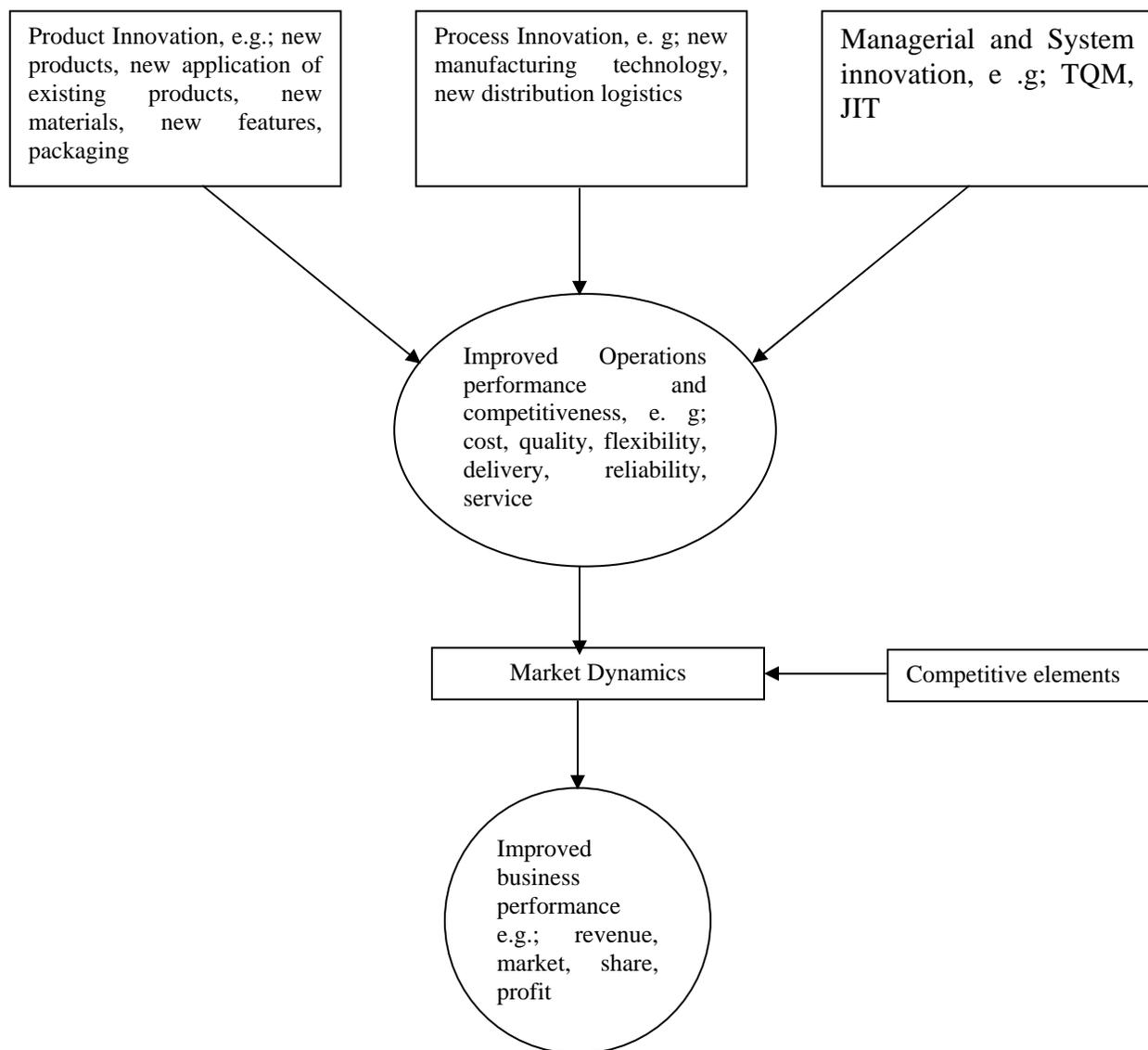


Figure 1

The terms innovation, entrepreneurship, invention, discovery, research and development and

intrapreneurship are often used interchangeably, where as innovation refers to new products, services and processes, entrepreneurship involve both identification and exploitation of the opportunities to innovate. Invention and discovery refer to the beginning of innovation process (idea generation and development), and R & D is referred to as formalized processes for pursuing innovative ideas and bringing them to fruition. Intrapreneurship usually refers to processes of innovation within organization boundaries, where as entrepreneurship can include the creation and growth of new enterprises. ( Samson, D. 1991)

The importance of innovation in an organization depends very much on the industry in which that organization participates and it's positioning with respect to competitors. Where as some firms innovate as a conscious part of their organization's competitive strategy, others by nature are technological followers, attempting to compete by other means. The degree to which innovation is a part of competitive strategy should influence the way in which the goals are formulated, the way in which work groups are structured, the way in which organizational culture is developed and the way in which resources are allocated (Schroeder et al. 1986).

With some notable exceptions, innovation is often less directly the basis for consumer choice than such elements as product cost, quality and delivery. Consumers do not usually make choices based on how innovative a company is in general, but make choices based on the tangible innovative features of products (given that the cost and quality of such innovative products is suitable). For example, the Sony Corporation ( Morita, 1986) has been successful through being able to develop and resource an innovative corporate culture, which has led to a stream of new and successful products based on in-house product and process technology. Hewlett-Packard is another example of a company that spends a lot of money on innovation and in which innovation is an important part of the overall business and manufacturing strategy ( Samson, D. 1991).

### **Methodology of accomplishing Innovation:**

The innovation process requires different activities, including idea generation, championing and project leading/ management. For these and other functions, most successful companies believe that the championing role is crucial. Peter and Waterman (1982) pointed out that when Texas instrument reviewed 50 new product introductions, every failure was characterized by not having a volunteer champion.

Kantar (1989) argues that the nature of an innovation is that it must be autonomous of mainstream value adding processes such as production, distribution and marketing, and that innovation or new stream activities are fundamentally different in nature from mainstream systems. Kantar suggests that successful managers should be able to manage both styles of operation, including the stable environment of the mainstream which is productivity and profitability oriented and the uncertain, volatile and knowledge intensive environment of the innovative new stream, where stability is required in terms of knowledge development but can not be expected in terms of cash flow and profitability in the same way as it is in the main stream. The major relationship between the mainstream and the new stream is that the mainstream must finance and resource the new stream in many different ways, while leaving it the autonomy to develop according to a different set of rules and controls from those that govern the mainstream. Ultimately, the new stream managers must prove their products and systems of use to the mainstream (Scully, 1987).

Boer and Haught (1988) suggest that not only is the quality of innovations important in determining competitiveness but the speed and cycle time associated with developing such innovations is a key competitive element. They argue that much of Toyota's success is associated with the speed at which it develops products and manages the whole value adding cycle in a highly integrated way, including not only its internal processes but also its many suppliers. The compression of time in innovation cycles is as important as being responsive to customer orders in main stream production and logistics systems.

Multifunction teams and paralleled activity development can accomplish increasing the speed at which projects are brought to fruition. This integrated development process is more complex to manage, as it relies on informal communication networks and knowledge sharing much more than on hierarchical and structured organizational boundaries

In terms of implementing speed, some companies are able to compete by being first to the market place with an innovative product or by being first to take advantage of new processes, whereas others are much slower in reacting to change. Consciously making time an important element of a company's culture is an important factor of the innovation activity. A tradeoff needs to be made between doing it right by doing it very slowly and systematically and doing it quickly such that it is effective if not absolutely perfect. This is a matter of not only managerial style, but it is also a matter of competitive positioning. The delicate balance between being business driven versus technology driven affects the speed issue.

The innovation process need not be an unstructured art, but can be scientific and systematic in its execution. Research and Development need not be loose, unstructured collection of creative people with good technical skills doing whatever they want, but can be a business driven activity aimed at improving competitiveness through developing improved or new products and processes. Resources that support R & D should be channeled into those projects/ activities, which support specific business opportunities. Hence, to manage an innovation culture and a set of innovation processes and projects, the initial activities should include (Samson, D. 1991):

- A market analysis, including customer surveys
- An analysis of competitor's products
- An analysis of technological strengths and weaknesses within the industry
- A competitive benchmarking process, which is an analysis of how specific needs that are not at present being fully satisfied might be filled through new developments of product, process or organizational systems, relating the company to the customer and to competitors

In this way, the innovation process can be business and market driven as well as technology pushed. Indeed, the crux of successful innovation involves the correct interfacing of business and market pull needs with the technological capabilities or push in an appropriately resourced corporate environment. Also concentration on Kaizan through innovation has proven to be a very successful strategy especially in Japanese automobile industry.

In an empirical study which compared lead times for product development in the Japanese, US and European automobile industries, Clark and Fujimoto (1989) found that Japanese projects came to fruition 19 months faster than corresponding US and European counterparts. Of this 19-month difference, approximately 12 months was a net lead-time advantage. These advantages were found in both the planning cycles, and the engineering development cycles. They suggest that

the difference can be explained by:

- Internal organizational capability for quick problem solving cycles and overlapping linkages among them. This effect is to create rapid, integrated problem solving in engineering.
- Strong supplier capability in engineering and a quality of relationship that enables the Japanese auto makers to maintain a low level of project scope while using a large fraction of unique parts.
- An innovation strategy that emphasizes smaller, more incremental changes in technology introduced more frequently. While a given change is less, the rate of technological progress may be high in the long run.

In a study of both Japanese and US firms, Pascal and Athos (1981) suggested that there are seven factors involved in establishing a culture of innovation. These are:

- Style
- Staff
- Skills
- System
- Structure
- Strategy
- Super ordinate goals

Their view of the success of consistently innovative companies---that is, companies that compete through successfully commercializing a series of innovative products and processes---is that the Seven S –factors are successfully related to each other in building up a commitment and value system which fosters appropriate risk taking and innovative behavior, positioning the new stream of innovation parallel to main stream value adding processes.

Hayes et al. (1988) suggest that development projects should be evaluated in terms of resource utilization, quality of designs and development cycle time. They argue that many firms suffer through not using all three of these important criteria to measure and control development projects---whether they are product or processes development projects. Hayes et. al. Suggests that the conventional way of managing development projects needs to be challenged, and that a new paradigm needs to be set in place that would involve:

- Changing from non negotiable project specifications and costs to those requiring occasional revision and flexibility
- Changing the focus sequence from being marketing led followed by engineering led followed by manufacturing, to a cross-functional team effort during the whole of the process.
- Changing the project phases from being sequential to overlapping.
- Changing and eliminating management obstacles and practices, such as transferring key members out of project teams to other jobs, changing priorities, changing resource allocations, and making the new stream an effective and legitimate part of the business.
- Changing organizational structures from rigid and hierarchical to flexible, open information

sharing, and based on trust and mutual respect throughout project teams.

**Conditions for flourishing innovative process:**

The conditions necessary for innovative processes to flourish can be summarized (adapted from Burgelman and Maidique, 1988) in terms of:

1. Correctly allocating resources
2. Understanding competitors and markets
3. Understanding technology
4. Achieving the right business structure and culture
5. Correctly managing entrepreneurial behavior

These points highlight the fundamental key to successfully creating wealth through innovation, which is blending of technological and managerial skills. Although it is possible to achieve this blend in an organization without having a single person with significant expertise in both areas, it is clearly an advantage to have key individuals in an organization with both technical knowledge and managerial skills. Such people often have the ability to create the vision needed to guide organizations through the often-frustrating process of investing in new products and processes with the prospects of returns on investments being uncertain and far off in future.

In manufacturing, a number of conditions generally lead to more effective innovation (Samson, D. 1991)

1. Managers must expect innovation, resource it and understands its risky nature. Whereas incremental innovations may not involve much uncertainty, radical innovations involving breakthroughs in product concept and design, or process improvement, require a culture that encourages the right amount of risk taking behavior
2. Organizations must support policies such that product or process champions and brainstorming teams are recognized as legitimate contributors to the firm. Multiskilling, decentralizing, and reducing the formalization of divisional boundaries and control systems tend to increase the propensity to innovate.
3. Manufacturing manager need to get closer to the customers. This is the part of cross training all employees and educating them to challenge existing norms. Innovation by its very nature involves a disruption of current practices and product mixes.
4. Resources in terms of time and money should be devoted to innovation.

**Examples of Innovative processes:**

A good example of an innovative company is Helene Curtis, Health and personal care Products Company, which has based its growth on successful innovation. C.G. Cooper (1989) attributes the success to:

“Innovation at our company has a narrow focus, but it has broad implications for long term success. Very simply, it means growth through developing new products that meet and exceed customer demands. Innovation serves every one, from employees to customers to communities and shareholders, because it generates pay offs for years to come.

Two concepts go hand in hand with innovation. They are risk and patience. Having a new

idea is not enough. A company must be willing to take risks to exploit that idea. It must put its resources and even its prestige on the firing line. And it must prepare to deal with the failure of the idea, because if there are no failures, there has been no risk.

An essential part of that risk is the willingness to give the idea time to develop and grow. Sometimes, even the best of ideas is not immediately recognized. A company must be willing to continue to nurture it, and if necessary, redesign, reposition or otherwise recalculate the concept.

Our company can develop new products rapidly and cost effectively because operations are organized to foster innovation. Management is less stratified than at most larger competitors. By maintaining a lean organization with relatively few layers, the company has in place a committed team that can move fast to respond to the needs of the market place.”

Not all innovations work in the way in which they were expected to work. For example, when in 1980s, a new formula Coca-Cola was launched, the Coca-Cola Corporation expected on the basis of substantial market surveys and tests, that they had anew product which would replace the existing Coca-Cola formula and which would have a big impression on consumers in the very competitive battle that was raging with Pepsi. An unanticipated backlash occurred from consumers who were loyal to the old formula and taste of Coca-Cola, causing a substantial turnaround in policy and a re launching of the old formula ( Samson Danny 1991).

Another very important factor regarding innovation in processes and products is that of imitation. It is critical factor in any innovation project. Most of the companies have framed certain laws in order to curb the practice of imitation but still it is not possible to end this practice throughout the world due to many loopholes in laws and technological reasons. The imitators adapt the ideas of original innovators and there are certain incidents recorded in which the imitators take lead in the market. The most important factors in order to avoid imitation are time period required to complete any innovative project and marketing of newly innovated products and services. The following table\* classifies successful and losing innovators and imitators.

	<b>Name of Company</b>	<b>Product</b>
<b>Successful Innovators</b>	Pilikington	Float Glass Process
	G.D Searle	Nutrasweet
	Du Pont	Teflon
<b>Successful Imitators</b>	IBM	Personal Computer
	Seiko	Quartz Watch
	Matsushita	VHS video Recorder
<b>Losing Innovators</b>	RC Cola	First to market with a diet cola
	EMI	CT scanner
	De Havilland	Comet
<b>Losing imitators</b>	Kodak	Instant photography
	DEC	Personal Computer

\* Source: Samson, D. (1991)

**CONCLUSION:**

This study indicates that the ability to profit and benefit from innovation requires a multiplicative factor of value adding which must be achieved through manufacturing, distribution and marketing. The companies that have had major successes through innovations have been those that were set up to exploit the new technologies fully. Also, any innovation in processes and products of any organization requires a systematic planning of the project because in the absence of such a planning, there increases the chances of failure of the innovation project.

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