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Novelty and its responsibility for Manufacturing in today's Consumer Service Economy with Creativity

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Abstract

The growing importance of services in Western economies has led to decline in manufacturing industries. On the other side Asian giants such as China along with countries such as Taiwan and Vietnam have become a global manufacturing hub. India after a long history of being specialized in IT services has started focusing on manufacturing sector. This sudden interest in manufacturing also simultaneously posed a challenge and an opportunity for the managers in manufacturing sector. This paper reviews the current state of novelty to see how manufacturing can leverage from the advancements in technology and type of novelty. It is important from Asian context as the novelty literature till now focused more on Western economies. Technology growth has benefited services in a radical manner as it facilitates the maintenance of networks with customers and partners within and outside the organization. So, manufacturing has to manifest superior value in the customer-driven marketplace along with the novelty. The paper concludes that novelty will only help manufacturing if the firm is able to focus its entire energies to think on behalf of the customer.

Keywords: Manufacturing, Novelty, Consumer Service, Creativity

1. Introduction

The increasing and growing importance of services has led to Western economies as service economy. The emerging concepts as Service Dominant Logic (Vargo and Lusch, 2004) have provided a different lens to manufacturing versus product debate. Irrespective of growth in services, manufacturing remains a core competency and development imperative for many developed and developing countries. China is one of the best examples, which showed the

world the power of manufacturing sector. This has prompted other Asian countries to restart focus on manufacturing. Indian Government‘s latest call for ―Make in India‖ is an attempt to build manufacturing capabilities in the country.

There is a growing consensus that economic growth, a higher disposable income, and technological advancements in emerging economies will lead to rapid growth in manufacturing-sector (Jayaram et al., 2014; Paiola et al., 2012)

This is a conceptual paper focusing on the novelty literature and its contribution. The objective is to synthesize this body of knowledge and develop future directions for growth in manufacturing with a focus on new age customer.

2. Theoretical Background

The process of translating an idea or invention into a good or service that creates value or for which customers will pay is known as an novelty. To be called an novelty an idea must be replicable at an economical cost and must satisfy a specific need. Novelty involves deliberate application of information, imagination and initiative in deriving greater or different values from resources, and includes all processes by which new ideas aregenerated and converted into useful products.

In business, novelty often results when ideas are applied by the company in order to further satisfy the needs and expectations of the customers. In a social context, novelty helps create new methods for alliance creation, joint venturing, flexible work hours, and creation of buyers' purchasing power.

Novelty are divided into two broad categories:

- Evolutionary novelty (continuous or dynamic evolutionary novelty) that are brought about by many incremental advances in technology or processes
- Revolutionary novelty (also called discontinuous novelty) which are often disruptive and new. Novelty is synonymous with risk-taking and organizations that create revolutionary products or technologies take on the greatest risk because they create new markets.

2.1 Sources of novelty

There are, of course, novelty that spring from a flash of genius. Most novelty, however, especially the successful ones, result from a conscious, purposeful search for novelty opportunities, which are found only in a few situations. Four such areas of opportunity exist within a company or industry:

a) Unexpected occurrences

Unexpected successes and failures are such productive sources of novelty opportunities because most businesses dismiss them, disregard them, and even resent them.

b) Incongruities

An incongruity between expectations and results can also open up possibilities for novelty. Such an incongruity within the logic or rhythm of a process is only one possibility out of which novelty opportunities may arise. Another source is incongruity between economic realities. For instance, whenever an industry has a steadily growing market but falling profit margins.

c) Process needs

Anyone who has ever driven in Japan knows that the country has no modern highway system. Its roads still follow the paths laid down for –or by –ox carts in the tenth century.What makes the system work for automobiles and trucks is an adaptation of the reflector used on American highways since the early 1930s. The reflector lets each car see which other cars are approaching from any one of a half-dozen directions. This minor invention, which enables traffic to move smoothly and with a minimum of accidents, exploited a process need.

d) Industry and market changes.

Managers may believe that industry structures are ordained by the good Lord, but these structures can–and often do –change overnight. Such change creates tremendous opportunity for novelty. When an industry grows quickly – the critical figure seems to be in the neighborhood of 40% growth in ten years or less –its structure changes. Established companies, concentrating on defending what they already have, tend not to counterattack when a newcomer challenges them. Indeed, when market or industry structures change, traditional industry leaders again and again neglect the fastest growing market segments. New opportunities rarely fit the way the industry has always approached the market, defined it, or organized to serve it. Innovators therefore have a good chance of being left alone for a long time.

Three additional sources of opportunity exist outside a company in its social and intellectual environment:

1) Demographic changes

2) Changes in perception

3) New knowledge.

These sources overlap, different as they may be in the nature of their risk, difficulty, and complexity, and the potential for novelty may well lie in more than one area at a time. But together, they account for the great majority of all novelty opportunities.

2.2 Factors effecting novelty

An important dimension of policy analysis is the extent to which market or other factors constrain the ability of enterprises to innovate successfully. These can be obstacles that the enterprise encounters while carrying out novelty activities as well as factors preventing novelty. Cost factors were the most cited, including the direct resource costs of novelty activities and the cost and availability of finance. In particular, obtaining affordable finance was more often a problem for SMEs than for larger enterprises.

More enterprises felt constrained by economic circumstances than by internal factors, although the lack of qualified personnel was viewed as one of the more important factors (refer Table 1) constraining novelty.

Table 1 Factors affecting novelty

Economic Factors	**Internal Factors**
Excessive perceived economic risk Direct novelty costs too high Cost of finance Availability of finance	Organization rigidities Lack of qualified personnel Lack of information on technology Lack of information on markets Lack of information on markets

Table 2 Effects of novelty

Product oriented	**Process oriented**	**Others**
Increased range of goods or service opened new market or increased market share Improved quality of goods or services.	Improved production flexibility Reduced unit labor costs Increased capacity	Reduced materials and/or energy per produced unit Improved environmental impact or health and safety aspects Met regulations or standards

2.3 Effects of novelty

Enterprises innovate to improve competitiveness, leading to enhanced profitability. The survey (refer Table 2) sought information about the intermediate effects of novelty, on the market position and internal processes and costs.

The striking feature of the results is the spread of responses across the range of impacts, with no single type predominating. Generally, product-related impacts were more often cited than process (cost) impacts, with quality enhancements top rated. This suggests a strongly customer-focused approach to novelty.

3. Types of Novelty

3.1 Technology novelty

Novelty refers to the economic application of new idea and technological novelty is described as a process which transforms idea to the commerce. Novelty also characterizes as —a change in technology which is manifested in the development of new produce. Change, competition, strategy concepts are get more important in 80‘s and technological novelty has become the strongest engine driving society since the 1980s. Yet, technological novelty is not a new phenomenon which suddenly emerged as part of the space age. It has been around and shaped our life for thousands of years. Today‘s companies gain their competitive advantage and economic benefits largely from novelty. The role of technological novelty in this point is for business success and in many industries technological novelty is now the most important driver of competitive success by the way technological novelty can create new industries and transform or destroy existing ones.

At the origin of the technological novelty process are inventions or discoveries. The criteria for success regarding inventions and discoveries are technical rather than commercial. Technological novelty is used to refer to the process through which technological advances are produced. Technological novelty has been considered as a process that generates information from information but also knowledge which reverts exclusively to the innovator. In the novelty surveys there are two main approaches to measure the performance of novelty activities.

While subject approach is analyses firm, in object approach technological novelty is the unit of analyses. Main criteria of classification in object approach is technological fields. In modern business organizations technological novelty is normally aimed at the development of new products and processes (Loveridge and Pitt, 1996; 209). Managers and scholars have been interested in the differences between radical and incremental novelty process in organizations.

3.2 Service novelty

The increasing importance and growth of services as a major global industry (Shugan, 1994) have been of interest to academics and practitioners alike.

There is a consensus that economic growth, a higher disposable income and technological advances have contributed to the rapid growth of service-sector enterprises (Mattsson, 1995; Patterson, 1995), and have substantially increased their economic importance.

Advances in technology have directly influenced the growth and importance of services, in terms of independent service offerings, and as components of product and service packages.

Technology directly cuts costs; more importantly, however, it‘s most radical impact has been on conceptual thinking, in terms of the designation of “resources“ by a firm or country. In fact, technology and its capacity to affect every aspect of our lives have always been major determinants of human progress.

It is technology that renders it possible for these amorphous networks of expertise to come together in cyberspace and work in very close relationships, although they might be thousands of miles apart physically. Technology thus acts as an unparalleled tool that makes it possible for service firms to extend their core capacity.

3.3 Product novelty

Product novelty has been recognized as a primary means of corporate renewal (Dougherty, 1992), and as an _engine of renewal‘ (Bowen et al., 1994). At the same time companies have been exhorted to develop more innovative rather than incremental products, and there has been an emphasis on the development and marketing of key words: product novelty; firm competences; dynamic capabilities; organizational learning; path dependency. Underlying this strong interest is the notion that _really new‘ products are crucial to firm survival in the current fast-changing business environment.

Product novelty is defined as the process of bringing new technology into use (Galbraith, 1973; Schön, 1967).

Product novelty can be separated into three basic categories:

- Line extensions
- Me-too products
- New-to-the-world products.

Line extensions are products still familiar to the business organization but new to the

market. Me-too products are considered new to the business organization but familiar to the market; that is, imitations of competitors‘ products. New-to-the- world products are considered new to both the business organization and the market (Booz et al. 1982; Olson et al. 1995).The emerging ―capabilities‖ approach in the strategic marketing literature (e.g., Day 1993, 1994) offers a useful theoretical basis for analyzing the relationship between market orientation and product novelty.

Product novelty contribute to firm renewal. Organizational renewal involves the building and expansion of organizational competences over time, often involving a change in the organization‘s product market domain.

Product development is a dynamic capability of the firm, because of its ability to alter the resource configuration of the firm. Product development is one of the mechanisms by which firms create, integrate, recombine, and shed resources.

Product novelty generates path dependencies by its effect on firm competences, which in turn influence the new products the firm is likely to develop and be successful at. The availability of competences relating to some technologies or customers promotes product novelty based on those competences, whereas the lack of competence relating to other technologies or customers leads to the neglect of other novelty possibilities.

3.3.1 Types of product novelty

Simultaneously considering exploitation and exploration of customer and technological competences leads to the matrix of new product types. This typology shows how technologies and customers as firm competences impact new product development and are themselves impacted by new product development, and how these resource dynamics influence what type of new products a firm pursues. The two types of competences required for product novelty constitute the two dimensions along which products can be new to the firm: a new product can draw on existing technological competences or require new technological competences, and draw on customer competences that the firm already has or require a new type of customer competence.

The typology consists of ideal types. In practice, specific novelty are more or less like the ideal types (cf. Doty and Glick, 1994). In pure exploitation, a firm uses both existing technological and customer competences. In pure exploration, the new product is a tool to build new competences relating to both customers and technologies.

There are also two intermediate cases. Both technologies and customers are firm competences that can be leveraged. Leveraging technology (exploiting technology/exploring customers) implies appealing to additional customers through developing products based on an already achieved technological competence, whereas leveraging customer competence (exploiting customer competence/exploring technological competence) involves building additional technological competences to appeal to a greater share of existing customers‘ needs.

Judging the viability of a new product has two main dimensions: technological assessment and market assessment. Technological assessment involves judging the technological feasibility of the product (i.e., can the firm produce the physical product with certain features). Market assessment involves judging the market potential of the product (i.e., will the firm be able to sell the product).

3.4 Radical and incremental novelty

The definition of novelty does not refer to the size and scope of the change to the product, process, or service. For example, introducing color television in the mid-1960s was clearly a major or radical change to the established black-and-white TV market. But what if a smaller change were made, such as changing the material of the television cabinet? Novelty can be classified as either radical novelty or incremental novelty.

3.4.1 Radical novelty

Radical novelty is about making major changes in something established. Focus is significant in relation to this issue. A change can represent a radical novelty when viewed at a technological level, but the impact may be only incremental when viewed at an organizational level (refer Figure 1). When we examine novelty, it is the impact at this level that we are interested in. The term radical often refers to the level of contribution made to the efficiency or revenue of the organization (McLaughlin, 1999). For example, by introducing the flat-screen television, manufacturers radically increased the demand for such products. We can visualize radical novelty as a step change in some measure of growth such as revenue or efficiency.

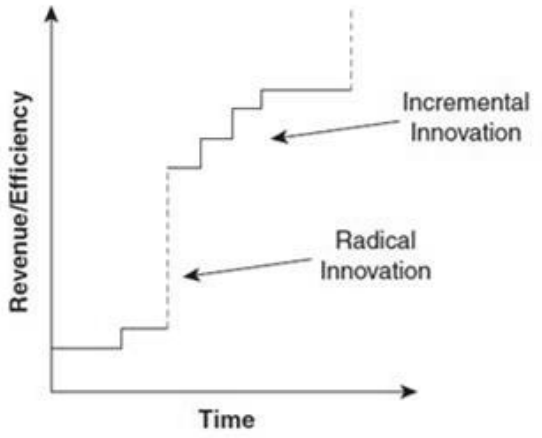

Figure 1 Novelty stages model 1

[1] Adapted from Managing Creativity and Novelty. Harvard Business Essentials. 2002, Boston: Harvard Business school Press.

Most organizations engage in some form of radical novelty over their lifetime. Radical novelty can threaten to transform the industry itself by destroying the existing market and thus creating the next great wave (Christensen, 1997; Utterback, 1996). Undertaking radical novelty can bring dramatic benefits for an organization in terms of increased sales and extraordinary profits, but it is also highly resource intensive and risk laden. Companies in the pharmaceutical industry can invest more than $400 million in developing a new drug (Light & Lexchin, 2003) and have no guarantee that it will ever pass clinical trials and make it to the marketplace. Because of the turbulence of the external environment, it is difficult for any company to say that a potential novelty will result in a radical impact; they can only pursue the novelty with the knowledge the scope exists for radical impact.

3.5.1 Attributes of Radical Novelty

Radical novelty has generally been characterized in two distinct ways. First, as rare events (Tushman and Anderson 1990) that result from a stroke of individual genius or luck rebellion and heresy.‖ (Mokyr 1990). These novelty can be unpredictable, incorporating a dimension of ―surprise‖ (Criqui, Martin et al. 2000). The historian Joel Mokyr (1990: 13) referred to macro-inventions as those that require one to step outside accepted practice and design ―an act of technological.

Second, radical novelty has also been described, in contrast, as a long and difficult process. Technological novelty is a risky undertaking and the development of a radical technological novelty is, in particular, often characterized as a lengthy, complex, and highly uncertain process, fraught with barriers and difficulties (Freeman and Soete 1997). These novelty have been associated both with high technical uncertainty (will it work, and at what cost?) as well as a high degree of market uncertainty (Freeman and Soete 1997). For example, Ettlie (1982) conducted of study of 40 federally supported novelty projects from five government agencies, and found projects were more likely to be commercially successful when the project involved incremental, as opposed to radical, technology. Radical novelty can take a long time—typically 10 years or longer—to bring to fruition (McDermott and O‘Connor 2002).Generally speaking, radical novelty, in their earliest incarnations, are usually quite crude. Their ultimate success nearly always depends upon gradual improvements, refinements, and modifications; the development of complementary technologies; as well as organizational change and social learning. In this sense, radical novelty is viewed as a process, rather than as a discrete event.

3.5.1 Incremental novelty

Although radical novelty often make headlines, most organizations spread the risk associated with novelty by also looking for small or incremental novelty to their products, processes, and services. In fact, some companies shy away from radical novelty altogether, preferring instead to invest in incremental novelty. Incremental novelty is less ambitious in its scope and offers less potential for returns for the organization, but consequently the associated risks are much less. Apart from using fewer resources, incremental novelty

consist of smaller endeavors, making them easier to manage than their larger counterparts. Incremental novelty such as increasing television speaker power or screen size often lead to small changes in growth. However, an organization may have to undertake more and more of these types of novelty to achieve the necessary growth to survive. If an organization successfully implements enough incremental novelty, then it can sometimes lead to the similar levels of growth driven by radical novelty. The drivers of incremental novelty initiatives can include approaches to continuous improvement such as lean manufacturing, total quality management, and world-class manufacturing.

4. Novelty and Creativity

In their paper Dreiling and Recker (2014) discusses that novelty is a capability required for long term sustainability of the organizations. The organizations need to build their capabilities and further maintained and replicated. They feel that novelty capabilities can be developed in a structured way and proposed a four stage model with set of guiding questions (refer Figure 2).

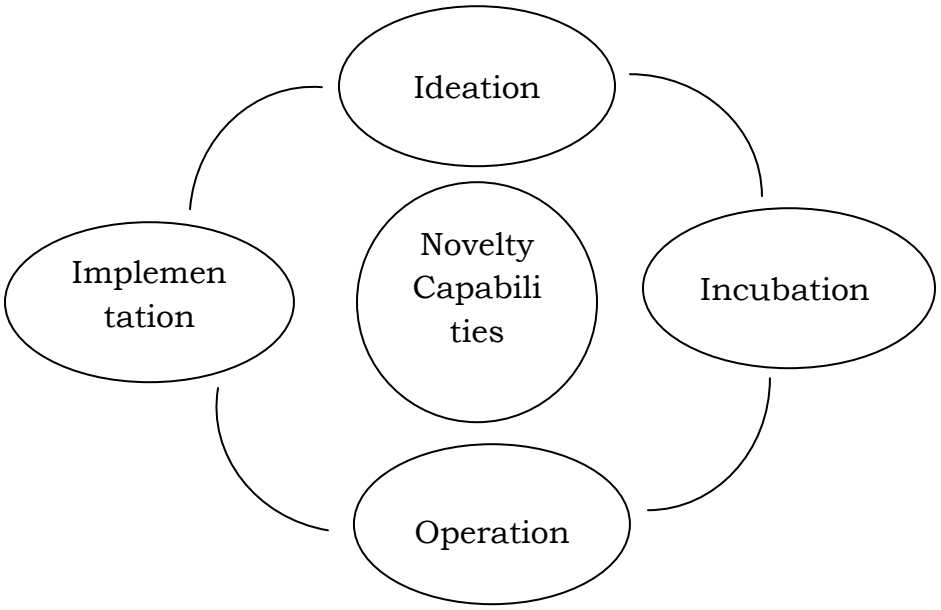

Figure 2 Novelty stages model

The questions for ideation stage are: what are the novelty artefacts? How to create ideas? How to build an novelty culture? Incubation stage include questions such as on funding or earning revenue, how to build and protect? Operation stage requires organization to develop, maintain and commercialization of novelty. Finally, in implementation the questions needed to be answered are: How to scale it? How to roll it out? And how to market?

The literature shows the need of novelty for the organization in a competitive global market using a systematic approach. This put organization in a difficult situation where the need of the hour is to reach the market at the earliest. If first entrant situation is lost in a

technology evolving market, the organization will take a long time to recover from this situation and may even lead to closure (Nijssen et al. 2006). Recker and Rosemann (2014) proposed certain strategies which will lead organizations to examine who is innovating and from where innovative ideas are generated. They proposed an organizational novelty framework (refer Figure 3) distilled around four cornerstone strategies.

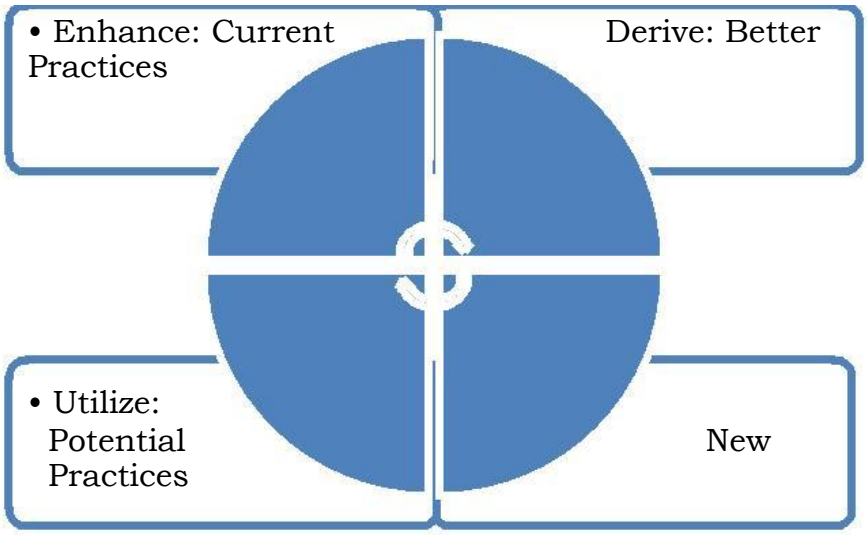

Figure 3 Organizational novelty Framework

They stress that only having strategies will not assist organizations in realizing innovative products, processes or services. The organizations have to understand where they need to innovate and also developing strategies to identify potential novelty (refer Figure 4). Thus, the organizations need to focus on a balanced path between a systematic approach and quick win strategies. But in both the cases the focus has to be on understanding the need and identifying novelty aligning with organization's requirements.

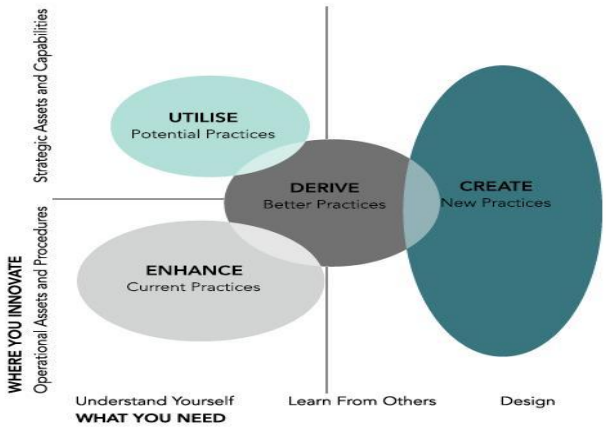

Figure 4 Organizational novelty frameworks

Distinction between Radical and Incremental Novelty

―The distinction between radical and incremental is easier to intuit than to define or measure.‖ As a result, studies tend to define radical novelty differently, and sometimes not at all (Dahlin and Behrens 2005). In general, the definitions and descriptions of radical novelty tend to characterize ―radicalness‖ either in a technological sense or in an economic sense. In a technological sense, radical novelty have been commonly defined as novelty that could not have evolved through improvements to, and modifications of, the existing technology (Helpman 1998; Lipsey, Carlaw et al. 2005). Radical novelty are based on a different set of science and engineering principles (Henderson and Clark 1990), and incorporate substantially different core technology (Chandy and Tellis 2000). Incremental novelty in contrast, improve upon and extend existing technology. Radical novelty are also commonly described as novelty that serve as the basis for many subsequent technological developments (Ahuja and Lampert 2001).

5. Conclusion

The paper presents an overview of the novelty literature. The state of the art is still debating about novelty and creativity. But there is unanimity that novelty leads to successful commercialization of product or service. There are ways through which novelty can be done in an organization. Again there are two thought processes in literature. One which values systematic or methodical approach to novelty. The other focuses more on pattern recognition either within or outside the organization.

Manufacturing organizations can look at both these thought processes and evaluate which is best according to the context. Finally, there are several success factors which actually attribute to longevity of innovative organizations. The success factors are: being aware of today and tomorrow, identifying market niches, observing and listening to customers, partnering and networking, getting the whole picture, value employees, promote a failure-friendly, inspirational company culture. Future works can look for empirical studies using any of the thought processes and identifying the factors attributing to success of innovative manufacturing organizations.

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