INNOVATION: A FRESH LOOK IN THE NEW MILLENNIUM

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With the new millennium well under way, there are many issues that arise within the rubric of innovation. All these issues may be categorized under four fundamental factors, and they are serendipity, scope, speed, and structure. Given the cardinality of innovation to organizations in general and marketing managers in particular, this paper elucidates these four factors, addresses some of the more timely issues from the vantage point of marketing management, and culls out key points for the marketing manager.

INTRODUCTION

The nascent millennium is making it clearer than ever before that, in all sectors of industry including academia, innovation is the key to survival let alone financial and market success. Whether a profit seeking manufacturing company or a not-for-profit museum, whether an airline or a car rental agency, whether a profit seeking research laboratory or a not-for-profit state owned university, whether a religious ministry offering a "promise of life after death" or an adult magazine company, each organization must constantly innovate its offering(s) and operations. However, within the rubric of innovation, mind-boggling leaps in technology have caused an explosion of new business models, products, and services that will take years to comprehend and absorb. This paper is an endeavor to aid the marketing manager in this regard.

Now is an opportune time to take a fresh look at innovation from both a conceptual and strategic perspective (Nataraajan and Bagozzi 1999; Bagozzi and Nataraajan 2000). With a new millennium under way, our expectations are colored by a century of technological progress whose magnitude is far greater than the collective progress experienced in all previous centuries of human existence on this planet. The 1980s brought use of Moore's Law, with the doubling of information processing speeds every 18 months. The introduction of "plug-and-play" architectures allowed for "make-to-order" personal computers and an industry in which prices decline an average of one percent per week. In the decade of the 1990s, revelations generated by Internet have brought forth a whole new slate of "laws" based technologies that have allowed a revolution in business models that is nevertheless in its infancy. Metcalf's Law poses that the value of a network increases as the square of its number of users. Gilder's Law states that the available bandwidth doubles every 6 to 12 months. Negroponte's Law argues the superiority of "bits over atoms" as we digitize business activities. Smith's Law argues that the goods, services and labor are becoming commodities with low costs and tight margins. These "laws" are facilitating the globalization of industries and competition, and putting increasing pressure on businesses to innovate everything. On top of this, the new millennium introduced completion of the even more stunning "mapping of the human genome" in genetics, an endeavor that will change the basic structure and nature of the pharmaceutical industry. It is therefore timely to dwell on the issues facing innovation. These issues have to do with the "planning" for innovations, the "scope" and "structure" of innovations, the "speed" of innovations, and the "management" of innovations (Crawford 1997). The first issue is whether innovation should be a planned or an unplanned process. The second issue is how widespread organizational innovations should be within an organization. The third is the speed with which innovations will occur in the new millennium. Finally, the fourth issue is how structured

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innovations should be. Prior to delving into these issues, it is necessary to elaborate on several aspects pertaining to the meaning and/or nature of the term "innovation" and we do this in the next section.

The Term "Innovation"

It should be understood that an innovation refers to anything new in a relative sense; if it is perceived as new by the individual, then whatever is experienced becomes an innovation to that particular individual. For instance, while it would be considered trivial and anything but new in the western world, as simple as the introduction of the act of boiling water to kill microscopic parasites became an innovation to the natives of the Peruvian Andes as they had never done that before (Rogers 1962). Innovation is not invention, but the application of existing knowledge in a new way. By applying the Internet to existing business, we have generated a whole new range of innovations, the consequences of which will be seen for many years into the future.

In this paper, however, we use the term innovation in a more specific sense; it refers to new offering(s) that an organization puts out on the market. The term "offerings", in turn, refers to products and services. An offering will exhibit both tangible and intangible characteristics. Further, any offering, which is predominantly tangible, is deemed a product and that which is predominantly intangible is called a service. Coffee, for example, has tangible (e.g., the coffee powder, container etc.) as well as intangible (e.g., aroma, the after-effect of caffeine etc.) elements. Despite this duality, coffee is called a product because it is mostly tangible. As another example, a car rental agency, commonly understood to be a service, has both tangible and intangible elements. The cars themselves are tangible. But how the staff interacts with customers as well as the program(s) features are intangible. In a fundamental sense, all offerings are essentially only services with varying proportions of tangible elements. Having e-mail requires a basic infrastructure to be in place that includes some form of terminal that has some form of connection to a network, such as the Internet. A firm provides such services, but only after the infrastructure has been developed. Telephone services and electricity continue to be examples of such services. Without paved roads, our transportation services might sport an entirely different look today as the transportation systems and products might be quite different.

Finally, an innovation could be radical (e.g., new-to-the-world products) or incremental (e.g., a new cavity resistant feature of toothpaste). Whereas radical innovations are few and far in between, incremental innovations abound. Given that monopolistic competition (a large number of firms selling similar products with minor or incremental variations in product differentiation and/or positioning) is widespread, incremental innovations will most likely dominate in the foreseeable future. That is not to say that some incremental innovations will not significantly impact our lives. The rapid takeoff of wireless technologies have added flexibility and pervasiveness to communication systems. Nanotechnologies and semiconductors have opened the door to all forms of miniaturization and portability of products too cumbersome to move. The merging of technologies, like communications and computers, opens a whole new range of offerings.

ISSUE 1: CAN INNOVATIONS BE PLANNED?

Traditional thinking dictates that the process of innovation should be highly "structured" with neat stages and checkpoints. This is based on the premise that for the innovation to be a planned process, it will necessarily have to be structured and orderly. Taxonomies abound but in general the stages are *Idea Generation, Screening, Concept Development and Testing, Marketing Strategy, Business Analysis, Product Development, Market Testing,* and *Commercialization* (Kotler 1994). The benefits of structure include clarity for stakeholders, congruence with the company mission and ease in pinpointing and defining problems. A planned process with neat stages and clear checkpoints may exhibit great clarity but it is not without its downside.

Drucker (1998) has contended that much of innovation has occurred as a result of a systematic and disciplined search. Relying solely on serendipity

was a practice of the distant past. Since innovation is a risky and therefore a costly process, it cannot be left to chance. Sony Corporation's cost for new product innovation has continued to escalate over the years. For example, Sony's initial success, the transistor radio, cost only $1.2 million in 1955. By 1985, the cost of developing the 8mm camcorder cost $1 billion. While such products have been the mainstay of Sony, few small firms could afford such developments. Consequently, product innovations must be planned so as to have control over the risks and development costs, and this is reflected in Figure 1.

A study completed by the Battelle Institute in 1973 describing such innovations as the heart pacemaker and video tape recorder, found that the average innovation took over 16 years to complete. The high cost of Sony's 8mm camcorder was caused by the 16 years it took to develop its charged-coupled device (CCD), which allowed digital translation of pictures to a level of acceptable quality. Sony's strategy was to achieve large scale innovations by focusing corporate R&D activities on developing new technologies into next generation components that can revolutionize a product category. The CCD has rendered old vacuum tube systems obsolete and reduced both the weight and size of video cameras. As shown in Figure 2, such new components become the core technology for next generation products, such as Sony's 8mm camcorder, a product category that Sony continues to dominate. Once the next generation product, often referred to as a new platform, is introduced, a variety of product versions can be introduced to provide customers with different features and price offerings. For example, Sony offers a variety of shock resistant sports versions of its cameras in different colors or fitted for underwater applications.

On the other hand, excessive control can discourage if not obliterate serendipitous innovations. While some executives and academics believe that "creativity can be taught", others argue against the assumptions that "serendipity can be planned". However, serendipity can at least be encouraged by cultures if not induced. 3M Corporation has been well known for its "Post-It" notes innovation, the serendipitous result of having developed a glue that didn't stick well. At W.L. Gore & Associates, Inc., most products were developed by employees to solve unique problems, such as the Gore-Tex arterial graft to replace human tissue. Such innovations were never planned, but were solutions that employees found for specific problems that utilized the company's core technology, Teflon materials. It would be prudent therefore to maintain a balanced perspective. Organizations must ensure an appropriate process to support large-scale innovations, particularly as innovations become more and more complex. Large and complex innovations require some level of structure and planning, or development delays and costs would lead to financial crises. But organizations must also encourage serendipitous innovations along the lines of W.L. Gore or 3M Corporation.

3M managers argue that the catalyst and/or promoter for serendipitous events are grounded in the corporate environment. The corporate culture must encourage creativity and reward innovation. This can begin with the recruitment of more entrepreneurial and creative employees and then continue with company policies that provide the freedom to be innovative. An astute recruiting staff will look for potential innovators who may have a trail of accomplishments already or who at least exhibit tendencies in this regard. After the hiring process is completed, the company must provide an up-beat and favorable environment to encourage creativity. Innovation is based on experimentation, and without acceptance of failure, employees will soon learn that creativity can be "dangerous to their careers." It is common knowledge that 3M invests a sizable percentage (6.5%) of their sales in R&D, but also permits all employees to spend up to 15% of their time working on projects of personal interest. It is this type of freedom that generates creative thinking that can result in innovations.

ISSUE 2: THE "SCOPE" OF INNOVATION IS EXPANDING!

The introduction of Internet-based technologies has spurred application intensive innovations. The development of new business models, often based on Internet technologies, is changing the very nature of a firm's offerings and services. It is becoming

FIGURE 1
Is Innovation a Linear Process?

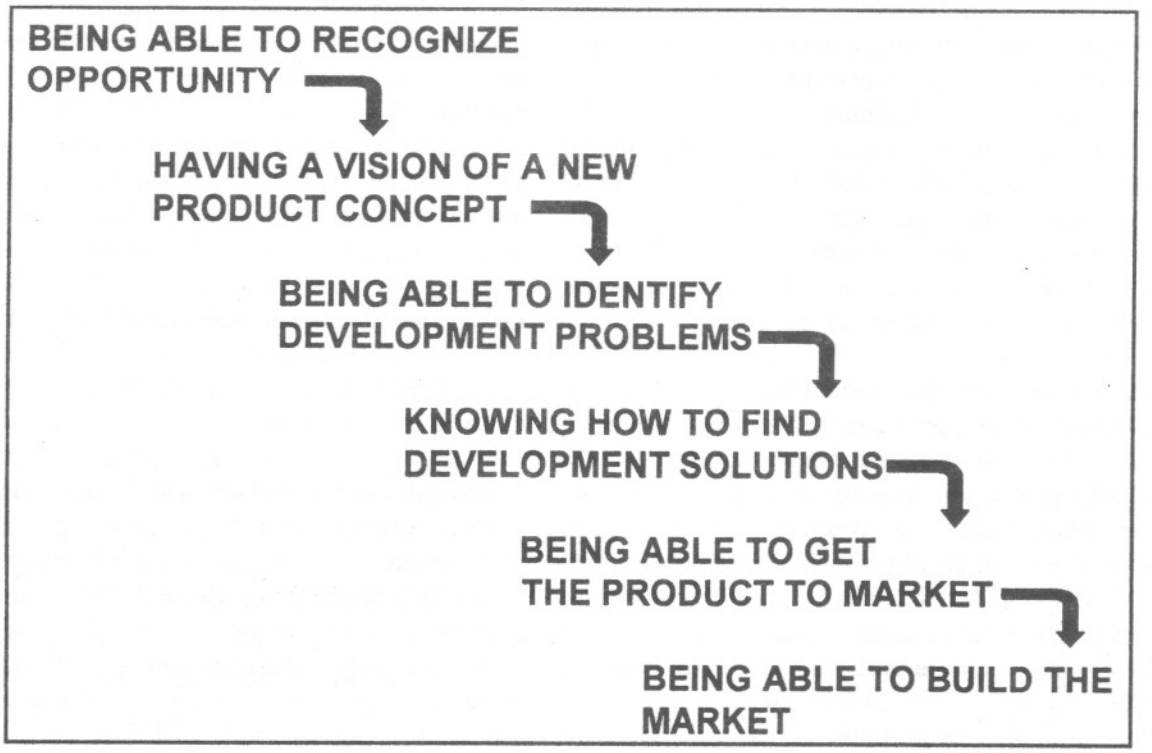
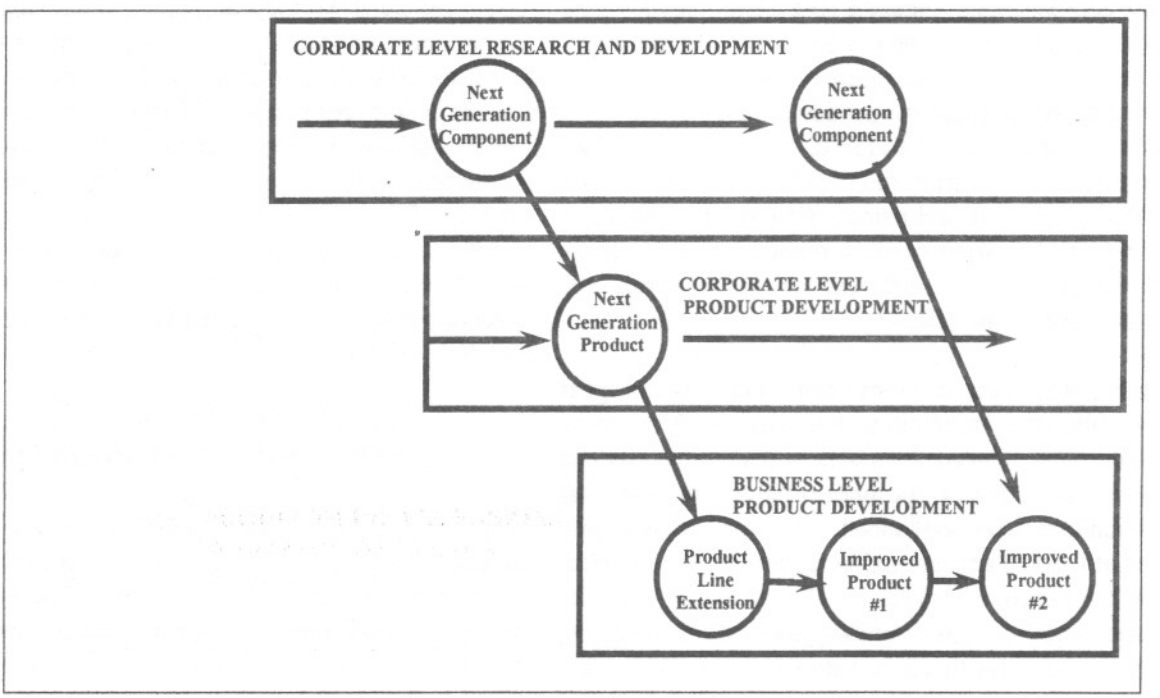


FIGURE 2
Technology and Product Development Planning



Source: Boulton (1995)

increasingly difficult to determine what the market will require as the "complete" offering in the future. The "one-stop-shop" model that has been so successful for Wal-Mart appears to be developing on the Internet. While the concept may not be an innovation, the application using Internet-based technologies provides a completely new approach to market access. The "one-stop-shop" on the Internet is called a "portal" such as seen at AOL.com and Yahoo.com. While these portals are attempting to be all things to all people, there are more focused portals that meet a specific set of needs. For example, AutoTrader.com and Edmunds.com provide a full range of services relating to finding and buying automobiles, from providing auctions for used cars to offering finance and insurance products (see Figure 3). AutoTrader.com is offering a full range of services for car buyers. It combines new car reviews, buying, financing, and insurance services in a one-stop-shop on the Internet. Such portal models put automobile dealers in the position of offering little more than routine maintenance and product trial services. Once the consumer decides on the vehicle for them, they need only search for the lowest cost supplier of the complete set of services needed to purchase the vehicle.

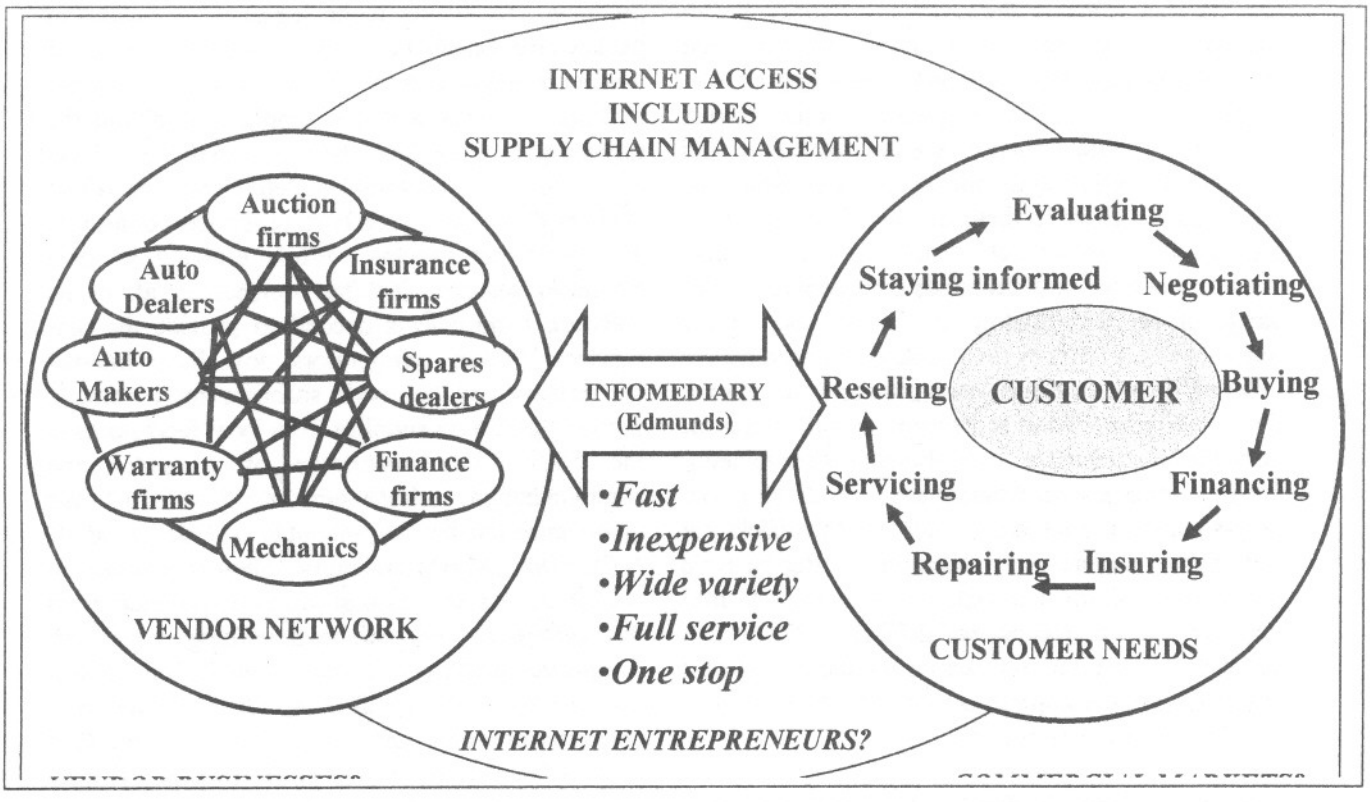
Amazon.com was the first to shock the "brick and mortar" world of book sellers by offering sales over the Internet. Amazon.com provides innovative processes that include rapid purchase features and recommends "books that similar buyers found of interest." Amazon.com now offers a wide range of other products, including CDs, videos, and electronics products. In addition to Internet-based sales, some firms (e.g., eBay.com) provide online auctions for individual sellers. eBay.com provides an alternative retailing platform for small business owners, who can now work directly from their homes without the overhead and limitations of a physical retail outlet. PriceLine.com allows customers to offer prices to airlines for travel on available flights. The old "brick and mortar" business models are being challenged to find new innovative ways to respond to these new Internet-based models.

At the product level, we see an equal explosion in technology-intensive innovations. Electronics are rapidly becoming an increasing proportion of all products, while they add new features at extremely low costs. Three decades ago, firms could master the five or six key technologies needed to make their products. Today, key technologies are embedded in the key components that make up a product, most of which are acquired from outside vendors. Firms use strategic alliances and key suppliers to obtain the technologies or components central to their products or services. For example, Dell Computer offers Website development and hosting services for as little as $14.95 per month. While utilizing its own advanced servers, Dell has outsourced all of its software requirements needed to provide the new services. Even refrigerators now have Internet connections and bar code scanners for automatic reordering of food supplies from local food stores in the UK. The integration of computer and communication technologies into mobile Internet communication devices is about to explode. In Japan, NTT's DoCoMo iMode hand set allows consumers to search the web for the best prices on products from their cell phone. Progress in developing inexpensive "chip-scale-packages", wireless systems, hard drives, and microprocessors will allow for completely new consumer products that will result in a new round of product innovations. Samsung Electronics, a Korean firm, has introduced a cell phone with an integrated Palm pilot that allows for continuous Internet connectivity, as well as PDA and phone functions. Products utilizing a new combination of component configurations with Internet-based technologies will spearhead an interesting first decade of innovations in this new millennium.

ISSUE 3: THE "SPEED" OF INNOVATION IS INCREASING!

Innovation was typically a slow process but it has become significantly faster within the last decade and a half. Today, many firms have access to the components needed to make full or final products (e.g., camcorders). As a result, shortened product life cycles (PLCs) and the growth in competition are making the innovation process "speed" paramount for many industries. The need for shorter development cycles is forcing changes in product development methods. More products are adopting computer-like

FIGURE 3
How Will the New Automobile Sales Meta-Business Model Affect the Industry?

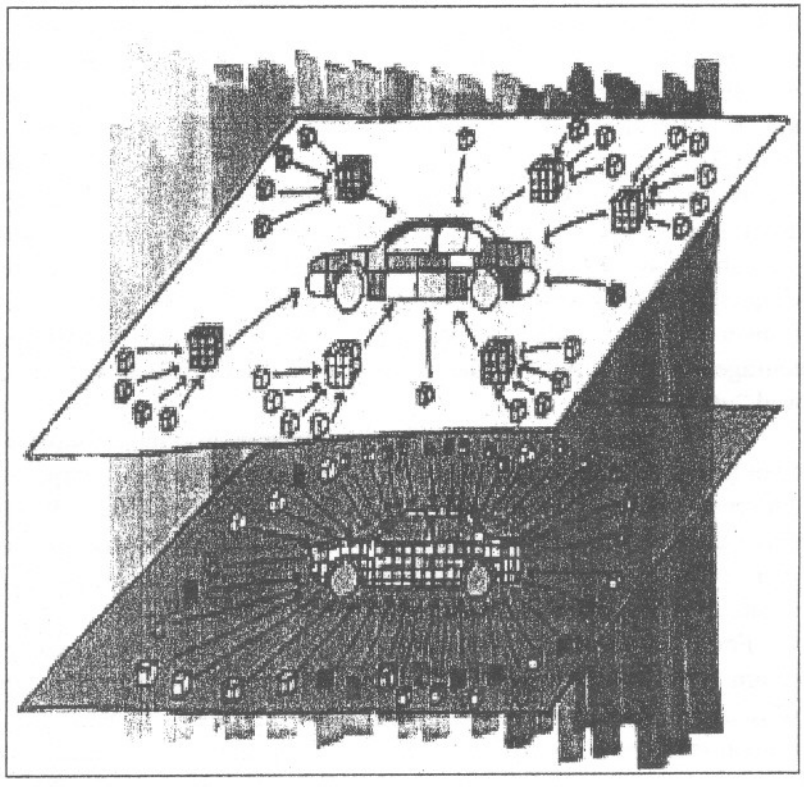


Source: William R. Boulton & Associates, Inc.

"plug-and-play" architectures that allow supplier components to be more easily adopted as upgrades are introduced. Even automakers have reduced their product development cycles from five to two years. Ford's new Focus was developed from concept to market in 18 months. Figure 4 depicts this change in product architectures for automobiles. For example, the BMW 1999 3-series platform contained 4500 different components, as suggested in the lower layer of the figure. In contrast, Mercedes Benz accounted for only 1250 components in the development of its M-class SUV. To facilitate more rapid development, suppliers must get involved in the development process so that more comprehensive components can be more rapidly integrated into the new model designs, as suggested in the upper layer of the figure. For Mercedes M-class SUV, for example, the completed dashboard, with all of its electronics, is a single component that is assembled and delivered to the factory on a just-in-time (JIT) schedule. In Brazil, Ford has one supplier that provides the complete frame and wheel assembly to its factory.

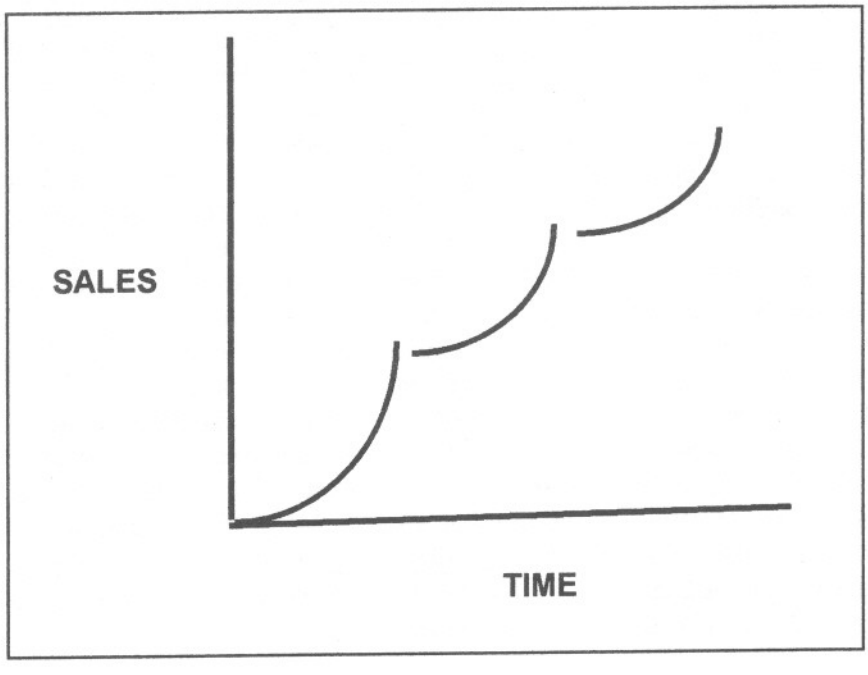
One can argue that development time is being compressed for all companies, although development "speed" varies from industry to industry. At one extreme, high-tech industries benefit from their technology-intensive environment, while food or hand-tool producers have been less innovative. As shown in Figure 5, high-tech products seldom reach the maturity stage of their product life cycle (PLC). Continuous innovation in components causes hig

FIGURE 4
Changing Product Architectures



Source: William R. Boulton & Associates, Inc.

FIGURE 5
Product Life Cycle for a High-Tech Product



obsolescence rate in the high-tech products, such as computers and cell phones. Technology changes so fast that, many a time, the current product never completes its growth stage as a new product replaces it. In an effort to shorten its development cycles, Microsoft makes beta-versions of its software available for testing by customers, letting early users find most of its software problems and evaluate the combination of features. This strategy allowed Windows 2000 to be introduced more quickly to the market, even though product testing was still incomplete. This high-speed development environment does not allow firms to wait to introduce a "perfect" product, but encourages them to "fix" it on the fly, or introduce improved "versions" more rapidly.

Products like food or hand tools have longer life cycles than computers. After all, Procter & Gamble (P&G) took 15 years to develop Pringles potato chips. But even food marketers are under pressure to introduce new products in order to sustain consumer interest in their offering(s). For example, Breyer's "Soft' n Creamy" ice cream was an attempt to satisfy customers who were tired of rock-hard ice cream that bent their spoons upon scooping (Lukas 1997). Lays WOW potato chips was the first to use Olestra, the fat replacement oil created by P&G. P&G was a follower with its Pringles fat free potato chips, thereby relinquishing leadership to Frito-Lay in this product category. In sum, Kessler and Chakrabarti (1996) opine that global competition, exponential advancements in technology, and the frequently shifting nature of customer demand have collectively made companies realize the importance of speed. In this millennium, we can predict that "speed" will continue to be a competitive weapon.

In the global arena, with consumer spending rising, barriers to market entry waning, technological gaps between countries closing, and Internet use spreading, every company will be challenged in developing new products and services and in bringing them to markets rapidly. Companies striving to become more innovative, often find they are imitating others (Levitt 1966) while trying to give the impression of innovation (Nataraajan and Sersland 1993). Benchmarking only encourages more rapid imitation, but competitive differentiation is less easy (Porter 1996). Leaders such as Microsoft or Amazon.com may enjoy a decisive advantage over other players in the global economic arena because of their reputations and brand image. Significant resources, such firms like Intel and IBM have garnered, allow for rather significant mistakes. Smaller players lack the luxury of major mistakes, and must be more flexible and innovative to survive. Unfortunately, unless small firms are both fast and accurate, success will elude them. In any case, today's technology intensive environment combined with the constant human craving for something new, and the globalization of competition will ensure that innovative products and services continue to enter the marketplace at an increasing pace. However, environmental and resource concerns, societal values, public opinion, and corporate inertia may mediate such speed (Lukas 1998) and the nature of innovations (e.g., green products, washing machines that conserve water, zero emission cars, etc.).

The above notwithstanding there is a cardinal connection between "speed" and failure. Enhancement in "speed" automatically brings about an escalation in failure rates of new products (Khirallah and Murphy 2000). This is mainly due to a lack of adequate testing owing to a paucity of time. Although this would be truer in the high-tech sector, the positive correlation between "speed" and failure rate may be a common feature among all industries, albeit in varying degrees. Take the example of on-line marketing by Toys 'R Us. Toys 'RUs.com was a hastily created incremental innovation in response to panic on the part of Toys 'R Us in the fall of 1999, when they saw Internet shopping for Christmas 1999 exploding. Their quick, but poorly planned response, resulted in a major fiasco as they could not keep up with the demand over the web and ended up with angry and disappointed customers. So while "speed" has become important, it has its downside; true to the adage, "haste makes waste". In contrast, iWon.com, the new portal that gives away money, outsourced its development and was developed and operational in about four months. It too had some start-up problems, but became one of the top ten portals within six months. Such speed, however, is not the benchmark for future competition. As Meyer (2003)

reiterates, it is not enough to be first to market; one should also strive to be first to market acceptance.

ISSUE 4: CAN INNOVATIONS BE MANAGED?

In new product development, there are often stages after which go/no-go reviews are held. It requires a target definition upon which the concept definition and development are derived (see Figure 6). After concepts become explicit, the basic platform and corresponding production processes can be completed for initial production. Once the next platform is completed, further variations or versions can be planned and implemented.

In contrast, many unplanned innovations derive from overlapping processes and stages/phases that occur simultaneously in varying intensity. In a sense, rigidity in structure is against the notion of innovativeness as it breeds "run of the mill" thinking. In an overlapping process, there is greater explicit participation of all parties concerned, particularly as New Product Development Teams (NPDs) are becoming more and more cross functional in composition without dominance on the part of any one section of a company (Crawford 1997). This is not to say that such cross functional teams constitute the sole center of innovations.

There have been a number of organizational proposals for managing new product innovations. What may work for one company may not work for another. Particularly, as we move toward more and more freedom in operation, the idea of one standard structure is slowly but steadily becoming a myth. For example, if the center of innovation is the development of a specific technology, such as Sony's CCD, the majority of work need only be carried out within engineering. Under such narrow developments, functional managers can be responsible for the innovation process (see Figure 7). Even in broader developments, it may be a specific technology that becomes the bottleneck for development, and needs intensive attention from only a single engineering area.

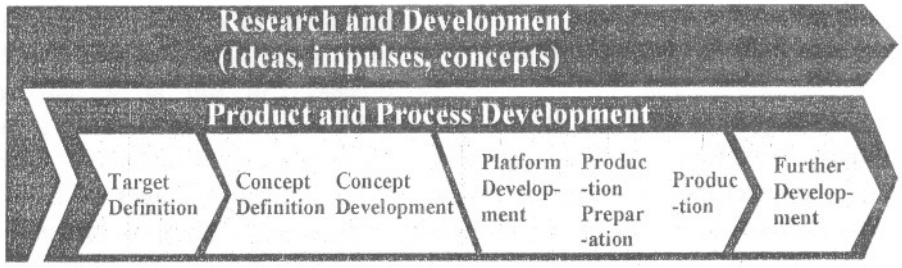
However, more structured stages of the new product process can ensure that all aspects of development are considered. Any short-cuts would erode the thoroughness of the process. Similarly, an overlapping format of stages requires stronger leadership of cross-organizational boundaries. It may be the modern way but, if left unbridled, the process can run amok and cause tremendous confusion. The key therefore is to be structured yet remain fairly fluid and allow overlapping. This way the fundamental stages of the NPD process can remain intact while allowing a particular organization to weave its own web around it. The result is a tailor-made process that is best for the particular organization. The preferred structure for such development is what we refer to as heavyweight team structures.

As shown in Figure 8, the project manager in a heavyweight team is the concept champion and leader of a cross functional team. It is called heavyweight because the project manager is generally a senior manager who has access to the organization's leadership and can obtain the resources and personnel needed to complete the development process.

In contrast with heavy technical developments, and platform developments, most innovations are incremental. They are extensions of platforms with new features or versions. For example, the BMW 3-series platform began with a sedan version. The next year, a coupe and station wagon version were introduced. In addition, the initial sedan required left and right hand steering versions, and offered alternative sports and premium options to broaden the market attraction. Then, each year, new features like automatic door locks and daylight running lights had to be added to keep the sedan fresh and up-to-date with competition. Such less significant innovations can be carried out with lightweight team structures (see Figure 9). In such cases, the team need only include functional liaisons required to access personnel who can provide the expertise to make the necessary incremental changes to an existing platform or version. As a result, lightweight teams provide an excellent training ground for future project or product development managers.

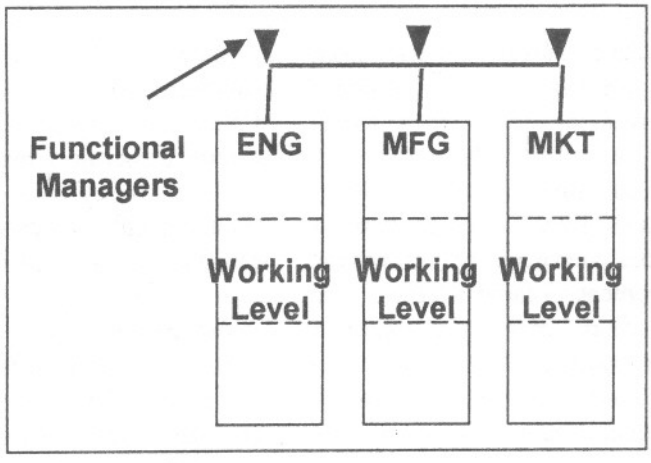
By planning a company's product development roadmap, a portfolio of projects can be established

FIGURE 6
Product and Process Incomplete Development Stages



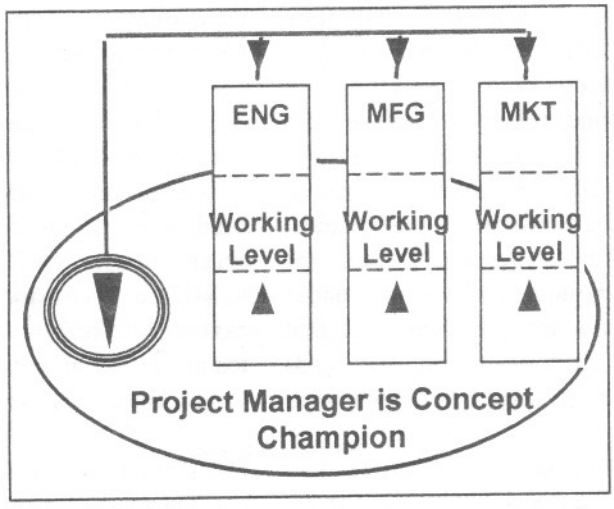
Source: Boulton and Dowling (2000)

FIGURE 7
Functional Team Structure



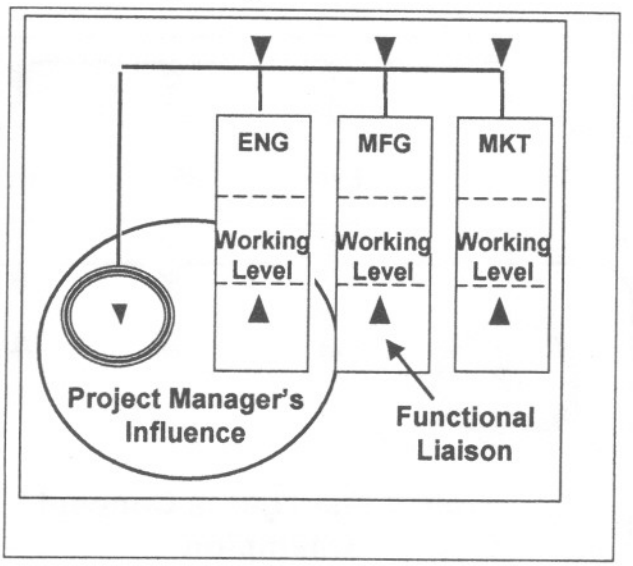
Source: Wheelwright and Clark (1992)

FIGURE 8
Heavyweight Team Structure



Source: Wheelwright and Clark (1992)

FIGURE 9
Lightweight Team Structure



Source: Wheelwright and Clark (1992)

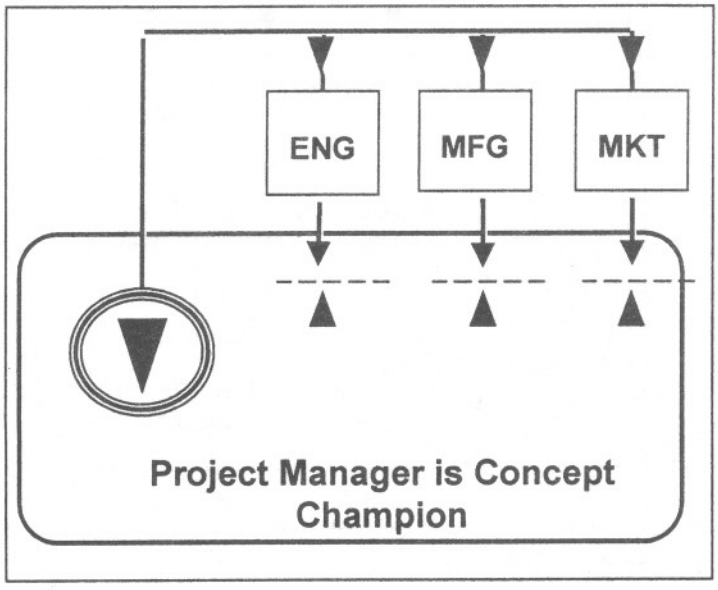
that includes long-term corporate investments in R&D having the mission to develop next generation components to provide significant advantages to future products. The introduction of such components into next-generation products can result in new platforms that provide opportunities for product variations. The continued improvement and extension of such products can sustain market acceptance and growth. As suggested here, each type of product development requires a different organizational structure and approach to management.

There are still those occasions when new innovations require a "white paper" approach. When the outcome is totally unknown and experimental in nature, the "autonomous tiger team" structure may be required (see Figure 10). This has no predefined structure or outcome and requires empowerment of the team that is independent of existing organizational units. Such teams become critical for radical innovations that may compete with existing product or service paradigms, and which may be resisted by the existing organization.

From the foregoing four structural alternatives, it should be apparent that there is no single way to manage innovation. Instead, management approaches and structural decisions are contingent upon the nature of the innovation and development process required. The more incremental the innovation, the more structured the process. The less predictable the outcome, the less structured the process.

Three points need to be mentioned in this regard. First, structural rigidity can give rise to bureaucracy and administrative bottlenecks. If innovation stages must be sequenced, then sequential delays become bottlenecks. Second, well planned processes will never resolve all uncertainties. For example, product costing models can never be fully validated until products actually get produced. If all costs must be resolved before moving on to the next stage, it is unlikely that developments will be timely. If the process is too rigid, downstream processes cannot provide needed value additions. Finally, no single structural format will suit every organization or every project; in other words, there is no OBW (one best way). Instead, there are a portfolio of management techniques and structures that are dependent on the nature of the project or product being planned. With the advent of the Internet and the integration of computer and communication technologies, every type of innovation will be seen and every form of structure will be needed. Flexible and insightful management will be key.

FIGURE 10
The Autonomous "Tiger" Team Structure



Source: Wheelwright and Clark (1992)

KEY POINTS FOR THE MARKETING MANAGER

The foregoing elucidation has hopefully offered some food for marketing management thought. The issues considered in it assume rapid innovations in the new millennium as new components provide a plethora of new product innovations and platforms. Given the globalization of competition, the quest for incremental innovations and radical innovations should explode. Given the need to be fast in innovation, who will invest in fundamental research and next generation component technologies? If history serves as a roadmap, we can expect new technical leaders to emerge and provide the critical components like Intel in microprocessors, Microsoft in operating systems, Sharp in liquid-crystal displays, or Texas Instruments in digital signal processors. It will be consumer driven firms that will find ways to build advanced products and provide value in incremental product configurations as firms like Dell and Gateway are doing in computers. The only question to answer now is who will be the next generation leaders?

The above notwithstanding several key points can be culled out for the marketing manager. These are:

1. **Innovate you must**. It is no longer a choice. If you don't do it well, it will only mean an express, involuntary, and rather unceremonious exit from the economic arena.

2. **Maintain a balanced perspective**. While large and complex innovations require some level of structure and planning, a marketing manager must nevertheless encourage and promote serendipitous innovations. Since the catalyst and/or promoter for serendipitous events are grounded in the corporate environment, the corporate culture must encourage creativity and reward innovation. Recruitment of more entrepreneurial and creative employees and sustaining this initial momentum with supportive company policies would greatly help in this regard.

3. **Be ready to respond to the new Internet-based models**. As pointed out earlier, the old "brick and mortar" business models are being challenged to find ways to respond to technology-intensive innovations utilizing new Internet-based know-how.

4. **Know that speed is important**. While development "speed" varies from industry to industry, in general, the combination of shortened PLCs, growth in global competition, and last but not the least, the increasing human craving for something new has rendered "speed' a competitive weapon. But haste can make waste. While firms with significant resources can afford to make monumental errors from time to time, smaller firms cannot afford that luxury. The latter will simply have to be both fast and accurate to avoid potential doom. A smaller firm lacking speed could emphasize the importance of "accuracy" in its promotion of its offering(s). In this regard, it would add to the effectiveness of its promotion if it can possibly and relevantly tie its "accuracy" to environmental and resource concerns, societal values, and public opinion supporting these noble causes. Such efforts may help it to be the first to "market acceptance" if not to the market.

5. **Be structured yet remain fluid**. In general, the more incremental the innovation is, the more structured the process should be, and the less predictable the outcome is, the less structured the process should be. Further, while rigidity of structure in the NPD can certainly ensure the active consideration of all aspects of development, it can create undesirable bottlenecks. Similarly, while an overlapping format of stages may be the modern way, it nevertheless has the potential to cause confusion if not downright chaos. It is therefore best to be structured yet remain fairly fluid with allowance for overlapping.

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