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## CUSTOMERS AS CO-PRODUCERS

### Implications for Marketing Strategy Effectiveness and Marketing Operations Efficiency

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"The customer is always a co-producer" is one of the eight foundational premises of marketing advanced by Vargo and Lusch (2004a; hereafter V&L 2004a). Indeed, the outlook as well as the manner in which firms relate to their customers and suppliers has undergone a metamorphosis in recent years. Furthermore, the view that the role of the firm, its customers, and its suppliers are distinct and delineable has given way to the view that their roles are interchangeable. The following examples are instructive in regard to the role of customers as co-producers:

SBC Communications, a telecommunications firm, has achieved considerable success in motivating its residential customers to migrate to the Internet and sign-up for online billing and payment in place of paper based bills being mailed to the customer's home address. In an attempt to promote customer migration to the Internet, SBC offers its customers financial incentives such as a dollar off on their monthly telephone bills and non-financial incentives such as free services (e.g., reverse number look up directory) and enhancements (e.g., the ability to view past bills). Northwest Airlines offers customers in its frequent flyer program a discount of 1000 frequent flyer miles for redeeming frequent flyer miles for travel awards on its web site rather than calling a reservation agent via its toll free number. After the expiration of the one-year warranty period, Hewlett Packard charges its customers \$25 to \$30 for providing customer support for its hardware products over the telephone. However, its Internet based self-service customer support system is priced considerably lower (New York Times 2003, p. 5).

Paris Miki, a Japanese eyewear retailer, has developed a business environment that fosters dialogue and collaboration with its customers. The Mikissimes design system eliminates the need for customers to review myriad choices in order to select eyeglasses. First, the system takes a digital picture of the customer. Next, the system thoroughly analyzes the attributes of the customer and stated preferences regarding the kind of look they would prefer. In collaboration with the customer, the retailer works on adjusting the shape and size of the lens in order to achieve a perfect match. Finally, customers complete the design by selecting from a number of options for the nose bridge, hinges and arms (Gilmore and Pine 1997, p. 92).

An example that elevates the concept of the customer as a co-producer, to an even higher level, is a Microsoft initiative in the works that entails the use of the human body as a computer bus to communicate with various devices. For example, the initiative entails the use of physical resistance offered by the human body to input from a keypad or other input device. Complementing this initiative are efforts to use the human body to generate power for the network. For instance, a "kinetic power converter" in the wearer's shoe or wristwatch being used to produce electricity, much in the same way that an old fashioned self winding watch extracted energy from its owner's normal movements (The Economist 2004, p. 66).

As evidenced by the foregoing examples, the *motives, mechanics, nature, and extent* of customer involvement in co-production appears to be contingent on a host of factors. Collectively, in the first set of examples (SBC Communications, Northwest Airlines, and Hewlett-Packard), the mechanics employed to increase customer involvement in the co-production of service (by motivating customers to migrate to the online channel) encompass the use of monetary and nonmonetary incentives and disincentives. The overarching objective in all of these instances seems to be enhancing the efficiency of marketing operations, while ensuring that the effectiveness of the underlying marketing strategy is not compromised. In other words, customer resources are leveraged to increase customer involvement in co-production in order to lower costs (i.e., to enhance marketing operations efficiency). The Paris Miki example is illustrative of a business leveraging advances in technology to involve customers as co-producers in order to customize the product and achieve a closer fit with the unique preferences of individual customers (i.e., to enhance the effectiveness of marketing strategy). Here, *marketing strategy effectiveness* refers to the appropriateness of a business's decisions relating to the total amount of marketing resources deployed, types of marketing resources deployed, and pattern of deployment of marketing resources across resource types deployed to facilitate the achievement of competitive positional advantage(s) in the marketplace. *Marketing operations efficiency* refers to the minimization of costs incurred in implementing the chosen marketing strategy.

In reference to their foundational premise, "the customer is always a co-producer," V&L (2004a) note that the customer becomes primarily an *operant resource* (co-producer) rather than an *operand resource* (target) and can be involved in the entire value and service chain in acting on operand resources. Against this backdrop, this chapter explores how product characteristics, market and customer characteristics, and firm characteristics affect the extent of customer involvement with the firm in various activities spanning the value chain such as innovation and new product development, co-production, supply chain management, and customer relationship management. The catalytic effects of recent developments in the fields of communication technology, information technology, and self-service technology on these linkages are also explored. We then highlight the implications of customer involvement with the firm in various activities transcending the value chain from the standpoint of marketing strategy effectiveness and marketing operations efficiency.

The remainder of the chapter is organized as follows. First, we provide a brief overview of marketing strategy effectiveness and marketing operations efficiency. Next, we highlight the linkages between mass production and mass customization and customers as service recipients and customers as service co-producers. Third, we propose a conceptual model delineating factors affecting the intensity of customer involvement with the firm. We conclude the chapter with a brief discussion on directions for further research.

### MARKETING STRATEGY EFFECTIVENESS AND MARKETING OPERATIONS EFFICIENCY

Strategy exists at multiple levels in an organization, chief among them being strategy at the corporate, business unit, and functional levels. *Corporate strategy* refers to a firm's decisions pertaining to the business arenas in which it chooses to compete. A firm's corporate-strategy decisions manifest as its business portfolio and pattern of allocation of resources across businesses. *Competitive strategy* refers to strategy at the business-unit level and is concerned with where and how individual businesses in the firm's portfolio should compete in order to achieve and maintain defensible competitive positional advantage(s) in the marketplace. Cost leadership, differentiation, focused cost leadership, and focused differentiation constitute the broad generic competitive strategies that businesses can pursue. *Cost leadership strategy* refers to a business leveraging its skills and resources to achieve a defensible position of competitive cost advantage in the marketplace (i.e., being the lowest cost producer). *Differentiation strategy* refers to a business leveraging its skills and resources to differentiate its product offering from its competitors' product offerings to achieve a defensible position of competitive differentiation advantage in the marketplace (see Porter 1980, 1985). *Marketing strategy* refers to a business's decisions and actions relating to where to compete at a greater level of specificity (e.g., country markets, market types—business-to-business versus business-to-consumer—and market segments) and how to compete utilizing resources entrusted to the marketing function (e.g., market-based assets). Decisions relating to how to compete manifest as types of marketing resources to deploy, total amount of marketing resources to deploy, and pattern of deployment of marketing resources to facilitate the achievement of competitive positional advantage(s) in the marketplace.

Pursuit of a cost leadership strategy does not necessarily mean an intention on the part of a business to sell its product offering at the lowest price relative to competitors. It could well be a deterrent to competitors' using price as a tool to attract the business's customers. A competitive imperative for businesses pursuing a differentiation strategy is to make salient the nonprice attributes of their offerings to buyers. Toward this end, businesses segment the market into homogeneous groups and offer unique value propositions to each group such that heterogeneity in customer preferences is adequately met.

On one hand, the importance of achieving a sustainable competitive advantage as a means to achieving superior marketplace performance and financial performance seems to be widely underscored in the strategy literature. On the other hand, however, there seems to be a dearth of research focusing on business operations efficiency-related issues as well as a lack of appreciation of the importance of efficiently implementing a chosen strategy. As pointed out by Schendel (1985), a business, regardless of the strategy it pursues (i.e., cost leadership or differentiation), must strive to achieve a competitive advantage in an efficient manner.

All else being equal, a business pursuing a differentiation strategy will incur higher *manufacturing* costs relative to a business pursuing a cost leadership strategy. In addition, the former business is also likely to incur higher marketing costs as a consequence of the need to communicate effectively to customers the benefits associated with the unique and differentiating features of its offering. Efficiency in marketing operations can enable a business pursuing a differentiation strategy to be *price competitive* and less severely affected by rising factor costs associated with an inflationary environment (Miller 1984).

## FROM MASS PRODUCTION TO MASS CUSTOMIZATION AND SERVICE RECIPIENTS TO SERVICE CO-PRODUCERS: AN OVERVIEW

Over the past two decades, there has been a growing interest in distinguishing between mass production and mass customization as distinct ways of competing in the marketplace. In this genre, Hayes and Wheelwright (1979) offer a framework that matches the firm's product-market characteristics with the manufacturing process characteristics. They note that standardized products are best manufactured in assembly-line types of operations, whereas custom-made products are best manufactured in job shops. The reasons underlying such normative assertions stem from considerations of economies of scale and capital investments needed to produce goods in high volumes.

The success of firms such as Ford and Sears during the twentieth century is, in part, attributable to their pursuit of an undifferentiated marketing strategy—offering a standardized product, notwithstanding heterogeneity in customers' preferences. It is worth noting that the pursuit of an undifferentiated marketing strategy by large corporations gained primacy in the post-World War II era, more so due to the prevailing market conditions rather than businesses considering customers as objects of their action. That every customer is unique is a fact that long has been recognized by producers as well as marketing intermediaries. However, technology (information and manufacturing technology) that firms could employ to offer customized products to the specifications of individual customers at an affordable price was nonexistent. This, along with the need to make available low-priced goods in the post-World War II era forced firms to rely on economies of scale in manufacturing and distribution. Furthermore, customers seemed to be willing to trade off products customized to their unique needs for lower prices.

The issue of whether businesses could simultaneously pursue a strategy of differentiation and cost leadership has been actively debated for a long time. The success of mass customization strategy was impeded by the absence of mechanisms for interacting with customers and obtaining information about their specific needs and of flexibility (e.g., production processes) to alter the product in accord with the information pertaining to the preferences of individual customers. The significant progress in manufacturing technologies (e.g., flexible manufacturing systems, computer-aided design, computer-aided engineering) in the recent past implies that the factory is no longer a bottleneck to producing a variety of products. Likewise, developments in information technology (i.e., communication technology, database technology, and computing technology) enable customers to create value by collaborating with the firm. Consider the following case in point:

[General Electric's] plastics division recently launched a web-based initiative that shifted significant aspects of the innovation process to customers. This initiative forced GE to change the ways in which sales and marketing acquired information about and served its customers. GE does not design or manufacture plastics but instead provides resins that must match the end product as well as the manufacturing process employed. Since 1998, GE Plastics has enabled its customers to order plastics online and access its 30 years of proprietary knowledge through its website. Registered users are provided access to company data, engineering expertise and simulation software. By leveraging the available knowledge and technology to conduct trial and error experiments, customers are able to ascertain how a certain grade of plastic with a specific type of reinforcement would flow into and fill a

mold. The rationale for this initiative, which cost GE \$5 million, was the huge potential for cost savings, more so than the expertise of customers in this process. GE leverages the website to track prospects and transmit such information to the marketing staff. Fueling much of the growth of GE's plastics division are the one million visitors per year who are screened for potential sales which is approximately one-third of all new customer leads. The on-line tools have also enabled GE to enhance customer satisfaction at considerably lower costs (Thomke and von Hippel 2002, p. 79).

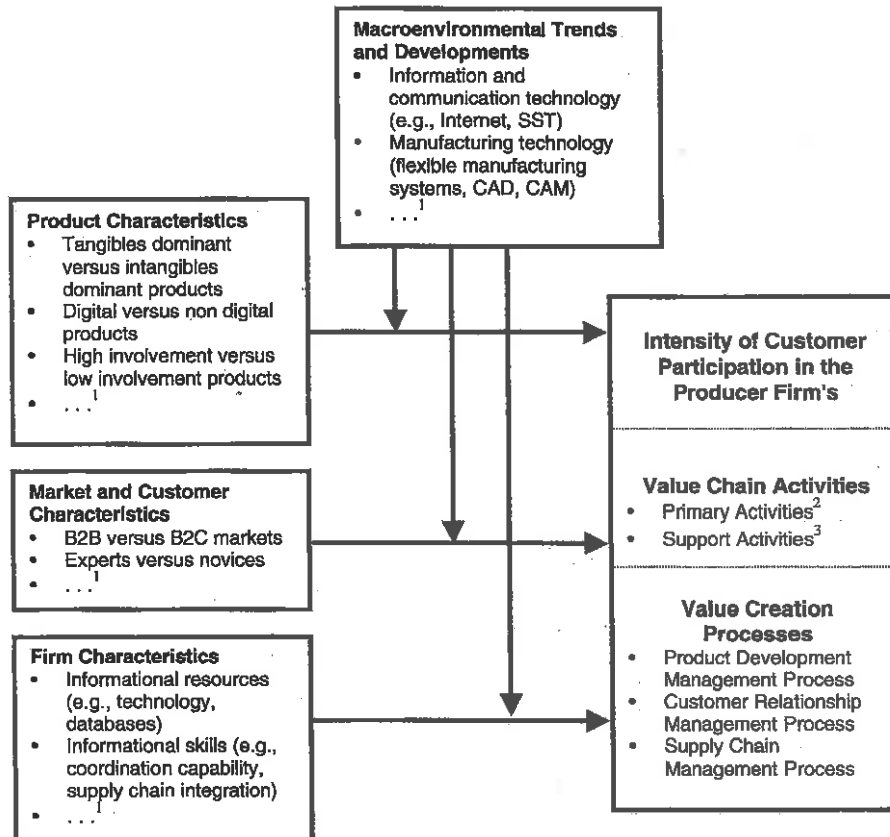
As can be inferred from the preceding example, the transition of manufacturing from a mass-production to a mass-customization environment and the transition of customers from being service recipients to service co-producers are closely intertwined. In the wake of increasing intensity of competition, in a growing number of industries, the viability of a strategy of cost leadership in the context of standardized products (coupled with the lowest price) is suspect. Needless to say, in certain industries and/or market segments in an industry, a standardized product offering at the lowest price (based on a strategy of cost leadership) might be viable. A more realistic scenario appears to be one in which mass-production and mass-customization strategies continue to coexist, thus providing businesses with flexibility in catering to a changing marketplace. A similar trend can be sensed from a demand-side perspective. It is conceivable that customers would choose to actively participate with the firm in co-creating value under certain contingencies and prefer to passively appropriate value in other situations. A detailed discussion of the factors influencing the intensity of customer participation with the firm follows.

#### **INTENSITY OF CUSTOMER PARTICIPATION WITH FIRMS: A CONCEPTUAL MODEL**

Figure 13.1 presents a conceptual model delineating the determinants of the intensity of customer participation with firms. A firm's value chain can be conceptualized in terms of primary activities necessary to physically create the product, market and deliver to buyers, and support and service after the sale is consummated, and support activities that provide the requisite inputs and infrastructure to perform the primary activities (Porter 1985). In reference to the value chain, *intensity of customer participation* with the firm can be conceptualized as the ratio of mental and physical resources contributed by the customer to that by the firm in the context of specific activities such as idea generation, product development, production, distribution, and postsale.

Alternatively, the intensity of customer participation with the producer firm can be conceptualized in terms of core business processes that are critical to the achievement of the organization's goals. Srivastava, Shervani, and Fahey (1999) conceptualize the creation of customer value in terms of development of new products (i.e., product development management process), acquisition and conversion of inputs into desired customer outcomes (i.e., supply chain management process), and development and maintenance of relationships with channel partners and end users (i.e., customer relationship management process). Each of these processes can be further disaggregated into subprocesses. For instance, the customer relationship management process can be disaggregated into customer acquisition, development and retention, and termination processes. The subprocesses can be further subdivided into specific activities and programs such as lead generation, lead qualification and customer referral (customer acquisition process), and cross-selling and customer loyalty programs (customer development and retention process). In summary, the foregoing conceptualizations highlight the broad scope of opportunities available to producer firms to co-opt customers in co-creating value.

Figure 13.1 Participation of Customers as Co-producers in the Firm's Value Chain: A Conceptual Model



*Note:* Participation of customers as co-producers can be construed in the context of either value chain activities or value creation processes.

<sup>1</sup>The items listed in the boxes are intended to be illustrative and not exhaustive.

<sup>2</sup>Inbound logistics, operations, outbound logistics, marketing and sales, and service.

<sup>3</sup>Firm infrastructure, technology development, and procurement (see Porter 1985).

The intensity of customer participation with the firm is modeled in Figure 13.1 as a function of (1) product characteristics, (2) market and customer characteristics, and (3) firm characteristics. In the interest of ease of exposition, although intrinsically continuous, a number of characteristics are shown in Figure 13.1 as dichotomous. The dotted line in each of the boxes serves to denote that the characteristics delineated constitute only a partial list and are intended to be representative rather than exhaustive. The model also explicates the positive effects of macroenvironmental trends in areas such as information technology, communication technology, and manufacturing technology on these linkages. That is, leveraging the potential of these technologies can enable firms to involve customer participation in various processes and activities to an even greater extent.

Consider for instance, the ability of customers these days to schedule the shipment of a package through a carrier such as United Parcel Service (UPS). At UPS's Web site, the customer can

schedule a time for the package to be picked up from a prespecified location, prepay with a credit card the cost of shipping, and print the shipping label for affixing on the package. After the package has been picked up, the customer can track the status of the package in transit and date and time of delivery by accessing UPS's Web site.

A detailed discussion of the rationale underlying the linkages explicated in Figure 13.1 follows.

### **Product Characteristics**

Product characteristics such as tangibles versus intangibles dominant, digital versus nondigital, and high versus low involvement can affect the intensity of customer participation with the firm in specific activities as well in the aggregate.

#### *Tangibles- versus Intangibles-Dominant Products*

The need to differentiate between goods and services in the context of marketing strategy was explicated almost three decades ago in a seminal piece by Shostack (1977). A key difference centers on the fact that whereas generally goods are first produced and then consumed, many services are characterized by the simultaneity of production and consumption. V&L (2004a, 2004b) note that such differences between goods and services are derived from a manufacturer's perspective and not from the customer's perspective. At a high level of abstraction, it can be argued that because both goods and services offer bundles of intangible benefits to customers; they are similar in nature. However, there are fundamental differences between goods and services even from a customer's standpoint that need further elaboration. Service-based solutions entail customers paying for temporary access, whereas goods-based solutions entail customers paying for ownership.

This is a nontrivial difference from the standpoint of both the firm and the customer. Consider for instance, a customer wanting to purchase (i.e., own) an automobile versus renting an automobile. Regardless, the automobile per se does not become more or less tangible. Although the core benefit derived in both of these situations is transportation, the customer is likely to evaluate these experiences differently. Whereas in the former, the customer is likely to place greater emphasis on tangible elements of the exchange (e.g., automobile features), in the latter he or she is likely to place greater emphasis on the intangible elements (e.g., ease of vehicle pickup and drop-off) of the exchange.

Similarly, consider for instance, a customer faced with the need to file his or her annual personal income tax returns. In this context, the choices of buying software (i.e., good) for income tax preparation versus buying the expertise of a tax consultant (i.e., service) might be viewed as substitutes. However, a closer examination reveals that using the tax preparation software provides the customer time utility (i.e., the ability to use it anytime), place utility (i.e., the ability to use it anywhere), and possession utility (i.e., the ability to reuse it a number of times). All else equal, leveraging the expertise of the tax consultant would require a greater amount of customer inputs (i.e., effort and time) in co-producing the outcome (i.e., tax returns), in light of the need for the customer to physically interact with the tax consultant to explain his or her tax history. Although use of the tax preparation software also entails customer participation in the co-production of the product, the extent of customer participation is relatively less because of the ability to preprogram the software to perform the bulk of the tasks entailed in co-producing the product.

In the context of health care, a credence good (Darby and Karni 1973), considerable information asymmetry exists between the health care service provider (the physician) and the consumer (patient). Nevertheless, the consumer is a participant in this service experience in that he or she is the object on which the service is performed. With the growth of the Internet, the diminishing

information asymmetry between the health care service provider and consumer offers the potential for better experiences for the consumer. Consider the following case in point:

News relating to the announcement of clinical trials for Gleevec, a promising leukemia drug by Novartis AG, diffused rapidly through patient communities resulting in thousands of patients wanting to participate in the trial. Furthermore, extensive activism by leukemia patients who were on early trials of this drug led to a speeding up of its production and the Food and Drug Administration (FDA) expediting its approval (Pralhad and Ramaswamy 2002, p. 4).

### *Digital versus Nondigital Products*

Sellers are generally faced with the dilemma of how best to respond to the heterogeneous needs of the marketplace. For example, should they modify the product, engage in persuasive communication (advertising), or offer incentives to align the market's preferences with its offerings? Among other factors, the cost implications of these alternatives are a function of the complexity of the product in question. However, for the most part, the cost implications are irrelevant in the context of customization of digital products distributed through the Internet. *Digital products* refer to products whose core benefits can be digitized. Newspapers, books, software, and music are examples of digital products. A fundamental difference between digital and nondigital products is the degree to which customers can potentially participate in creating value. Relative to nondigital products, digital products offer a broader range of opportunities for firms to engage customers to enhance the efficiency of marketing operations as well as the effectiveness of the underlying marketing strategy. Facilitating customers to access their Web site for purposes such as downloading software upgrades and patches and resolution of technical problems enables firms to lower the costs of their business operations without compromising the effectiveness of the strategy pursued. Case in point:

Claris, a spin-off of Apple Computer, in addition to employing web servers for external communication and dedicated servers for internal communication, employs bulletin board services (BBS) to communicate with its customers segments. The BBS serves as a central location for sharing of software files between the firm and its customers. During the launch of its first software, Claris leveraged customers as a resource to "debug" technical problems in the software by asking customers to download patches (i.e., software bug fixes) from its web server (Settles 1995).

The greater scope for customization of digital products also stems from the ability to aggregate (e.g., enabling a buyer to download a customized CD album that is a compilation of individual pieces selected by the buyer) and disaggregate (e.g., enabling a buyer to download a single song contained in an album rather than the entire album) at relatively lower costs. Similarly, a customer can create a customized electronic newspaper by requesting news alerts pertaining to mergers and acquisitions-related events, games featuring a favorite sports team, weather in specific cities, and reviews of new movies with favorite actors. Although, there is a nontrivial fixed cost associated with customization of digital products, the variable cost associated with customization is near zero.

### *High- versus Low-Involvement Products*

*Involvement* in a product category refers to a consumer's enduring perceptions of the importance of the product category based on his or her needs and values. A body of literature in consumer



behavior draws attention to the importance of this key product characteristic (high- versus low-involvement products) in reference to intensity of customer involvement with the firm (Bettman 1979; Petty and Cacioppo 1986). Realistically, the extent of customer involvement in the purchase and use of a product such as a house will be much greater relative to purchase and use of a product such as toothpaste. Customers are likely to be relatively unwilling to exert effort in the buying of low-involvement products because failure to exert effort is unlikely to have adverse consequences. V&L (2004a) note that regardless of whether the product in question is a good or a service, benefits cannot be realized without the involvement of the customer. Although consumption cannot happen without the involvement of the consumer, the resources expended by customers (i.e., cognitive and affective) will vary with the level of involvement in the product. Furthermore, the feasibility of involving customers in co-production and the potential for enhancing the efficiency of marketing operations through greater involvement of customers is greater for low-involvement, intangibles-dominant products than for low-involvement, tangibles-dominant products. Consider, for instance, a low-involvement, intangibles-dominant product such as air travel, and contrast it with a low-involvement tangible-dominant product such as toothpaste. In regard to the former, recent technological advances are conducive to greater customer involvement in co-production at multiple stages such as making flight reservations over the Internet, and checking in and printing of boarding passes at kiosks in the airport. In fact, as an alternative to printing of boarding passes at an airport self-service kiosk, several airlines allow customers to print their boarding passes at home, up to twenty-four hours prior to the scheduled departure time, using the customer's personal resources such as computer, printer, and paper.

### Market and Customer Characteristics

#### *Business-to-Business versus Business-to-Consumer Markets*

A key difference between business-to-business (B2B) and business-to-consumer markets (B2C) is the greater degree of interdependence between buyers and sellers in the former. The number of buyers in B2B markets being fewer compared with B2C markets makes sellers more dependent on buyers. Likewise, buyers are dependent on suppliers for a continued and stable supply of raw materials, components, or subassemblies that are essential for their business operations. In B2B markets, the product is an array of economic, technical, and personal relationships between buyers and sellers.

Along similar lines, von Hippel (1978) distinguishes between the *manufacturer active paradigm* (MAP) in B2C settings and the *customer active paradigm* (CAP) in B2B settings. In the former, the role of the customer is relatively passive, such as responding to questions posed by the manufacturer about needs for new products. In the latter, it is not uncommon for the customer to develop the entire product or solution and then approach the supplier to produce and commercialize the product. Specifically, customers provide product design data to the supplier along with information about the need for a new product. Consider the following case in point:

The "Solderless Wrapped Connection," a means for making a reliable, gas-tight electrical connection by wrapping a wire around a special terminal, was conceptualized and tested at Bell Labs. After years of testing, the hand tool portion of the system was built by Keller Tool, an independent supplier. Realizing the potential for marketing the solderless wrapped connection to some of its other customers, Keller requested and obtained a license to sell the hand tools in the open market. Currently, Keller is the major supplier of solderless wrapped connection equipment (von Hippel 1978, p. 41).

The growth of the Internet is enabling suppliers to serve clients *efficiently and effectively* in business markets by providing end-to-end solutions as opposed to being transaction oriented. Consider the following case in point:

Milpro.com is the website of Milacron Inc., an Ohio-based small machine tool manufacturer. Through Milpro.com, the firm sells high margin coolants, cutting wheels, and drill bits directly to small machine shops. In addition, the website also assists customers with a broad array of related *business* challenges, such as buying and selling used equipment, identifying new *business* opportunities, and troubleshooting problems. For example, the site includes a software wizard that guides customers through a set of questions about a process (e.g., grinding) and related problems (e.g., chatter marks) and then recommends particular products, much as an experienced sales representative would. Through such *services*, Milacron has been able to attract the attention and the *business* of small machine shops, a group that's difficult and expensive to reach through traditional channels. These shops, in turn, gain access to expertise that they could not otherwise afford and would not be available through a transaction-focused exchange (Wise and Morrison 2000, p. 92, emphasis added).

### *Experts versus Novices*

A firm's motivation to enhance customer participation notwithstanding, the idiosyncrasies of customers, such as their knowledge structures and receptivity toward the firm, affects their ability to contribute to the value-creation process. It has been observed that consumers generally have a disutility for cognitive effort; in other words, they tend to be "cognitive misers." The consumer behavior and psychology literature point out that expert consumers tend to have superior product category knowledge compared with novices. An implication of this difference is that expert consumers process information at levels above and below the basic level, allowing finer levels of discrimination. In contrast, novices process information at the basic level determined by concrete perceptual attributes (Alba and Hutchinson 1987). Along similar lines, research in new product development suggests that certain users face needs in the marketplace long before others (von Hippel 1986). As a result, there has been a tendency among firms in certain industries to involve lead users in developing and testing new product concepts. Consider, for instance, the development of Linux. A rudimentary version of the operating system was developed and posted on the Web by a student from the University of Helsinki. However, the credit for improving it significantly belongs to several expert users from all over the world who were able to download the software for free, test it for bugs, and modify it by adding new features. In such interactive product development situations, it is conceivable that users contribute more to value creation than the producer.

### **Firm Characteristics**

#### *Information Resources and Skills*

Competitive business strategy entails leveraging a firm's unique skills and resources to perform activities in the value chain better than competitors. Compared to the industrial era, during which a business's value chain was predominantly characterized by flow of physical goods and services, in the present, increasingly, the value chain is characterized by greater informational flows. In any industry, some firms are likely to be better at acquiring, disseminating, and utilizing

information than their competitors. The efficacy of a mass customization strategy depends on the technological skills and resources at the disposal of the firm to harness a vast amount of information about customers, tailor the product to the needs of individual customers, and deliver customized products. Consider for instance, the prevalence of recommendation agents in the electronic marketplace. Amazon.com recommends books by leveraging other customer's purchase data to create personalized shopping experiences. General Motors's Web-based virtual advisor provides recommendations based on information provided by customers about preferred attributes. Information and news delivered over the Internet to individuals' desktops are customized in accord with stated preferences.

Dell Inc.'s mass-customization strategy has received considerable attention in the business press. Dell's intranet sites, referred to as "Premier Pages," are customized to the requirements of more than 200 global customers and provide direct access to purchasing-related and technical information about specific configurations of its products such as desktop and laptop computers and servers. The Web site offers an interactive choice board that enables individual customers to customize their desktop or laptop computer based on the available alternatives. A problem that plagues and severely impairs the profitability of manufacturers of personal computers marketed through retail outlets is the obsolescence of the finished goods inventory at the retail level. By interacting directly with customers, PC manufacturers such as Dell are able to circumvent this problem as well as increase their inventory turnover as a result of being able to more accurately estimate demand. Real-time information about demand, in turn, allows providers of logistics services to better coordinate the transportation of the requisite number of components and sub-assemblies from the warehouses of vendors to the facilities of the PC manufacturer. Real-time information about demand also enables providers of transportation and logistics services to assemble related shipments from different facilities (e.g., the computer and monitor) and deliver them together to the customer (Magretta 1998).

The effectiveness of a firm's pricing strategy is also increasingly dependent on its skills at leveraging information about customers and bringing them to bear on its decisions in a timely manner. In the past, the absence of mechanisms to determine the reservation prices of customers implied that a firm's pricing strategy was frequently suboptimal, resulting in either loss of revenues due to low prices or lost sales due to high prices. With the information asymmetry that existed between firms and customers diminishing in an Internet environment, buyers are beginning to participate in the pricing process. The dynamic pricing strategy pursued by Priceline.com is illustrative in this regard. Instead of being passive recipients, customers indicate their initial reservation price and thereafter increase the price iteratively until the firm accepts the customer's stated price. Whereas the motivation for customers to *co-produce* stems from the desire to get the best price, the motivation for firms to enable customer involvement is to optimize the revenue realized.

In summary, it can be argued that underlying the ability of firms to increase customer participation in various stages of the value chain (e.g., inbound and outbound logistics, marketing and sales/service, operations) or in the core business processes (i.e., product development management, supply chain management, and customer relationship management) are its resources and skills that enable exchange of information, co-ordination with value chain partners (e.g., customers and suppliers), and delivery of the customized product to customers.

## FUTURE RESEARCH DIRECTIONS

This chapter highlights the nature and magnitude of customer participation in various activities spanning from idea generation to after-sale service with firms and its implications for marketing

strategy and marketing operations management. The increasing prevalence of customers as co-producers highlighted in this chapter raises several interesting research questions, most importantly, the likely adverse supply-side and demand-side outcomes of increased customer participation.

### **Supply Side Issues**

In general, increased customer participation in co-production has the benefit of enhancing the effectiveness of marketing strategy and/or enhancing the efficiency of marketing operations. However, managers must be cognizant of likely unintended consequences. For instance, the rapid proliferation of online customer communities has also resulted in customers actively interacting among themselves as well as being increasingly vocal in regard to their relationships with firms. The presence of consumer activist groups on the Internet poses unique challenges to managers in developing their public relations program. For instance, Markus Noga, a Lego Mindstorms customer, developed an unauthorized operating system for one of its microcomputers. By naming it LegOS, the ardent fan of the company made it available to everybody through online communities. The firm was faced with the challenge of how to respond to this initiative. On one hand, allowing customers to download this operating system could potentially damage the microprocessor in Lego Mindstorms's system. On the other hand, not responding raises the question of whether the firm should allow customers to override its code and claim intellectual property rights to their creation (Prahalad and Ramaswamy 2002). Amazon.com faced a similar public relations challenge when customers in online communities expressed their displeasure over being charged differential prices for identical products. While it is clear that the emergence of consumer advocacy groups in online communities is inevitable, explicating the mechanics for firms to engage with such online communities could benefit from further research.

Firms and customers relate to each other in several ways. In addition to being co-producers, customers could also relate to firms as competitors in either the same market or in a different market. For example, American Express and AT&T shared a buyer-seller relationship, in which American Express supplied AT&T with travel services for a long time. However, this situation changed dramatically when AT&T entered the credit card industry with its Universal Card in March 1990 (Carlin et al. 1994). Jack Welch, the former chairman and CEO of General Electric, rephrases the "Riddle of the Sphinx" and asks, "Who is my customer in the morning, my rival in the afternoon and my supplier in the evening?" (Bradley 1993). Hence, the need for research explicating the contingencies when engaging with customers rather than assuming that greater customer participation in co-production-related activities is always desirable.

### **Demand-Side Issues**

It has been pointed out that increased customer participation in co-production could have negative psychological outcomes for customers (Bendapudi and Leone 2003). Specifically, the self-serving-bias literature has been invoked to argue that situations in which the outcomes are jointly produced could have a detrimental effect on customer satisfaction. This is because of the tendency of customers to give themselves credit for positive outcomes but blaming the partner in the case of negative outcomes. Likewise, Dabholkar and Bagozzi (2002) note that consumer traits such as self-efficacy and need for interaction influence the degree to which customers are motivated to perform certain tasks in a dyad. There is a need for exploring the psychological processes affecting customers when they contribute in greater amounts to the value-creation process.

### Locus of Innovation

There is growing recognition that the knowledge required for generating breakthrough ideas in a number of industries no longer resides within a single firm. It is common in the field of biotechnology to find a single publication (e.g., identifying a candidate for the gene determining susceptibility to breast and ovarian cancer) involving researchers from varied fields such as medical schools, pharmaceutical companies, and government research laboratories. Producers of information products frequently rely on customers to beta-test new products. For instance, whereas Stata, the maker of statistical software packages, enlists the help of customers in writing software add-on modules for doing the latest statistical techniques, Bush Boake Allen (BBA) provides a tool kit to customers to develop their own flavors (Thomke and von Hippel 2002). According to the manager of Hallmark's knowledge leadership program, leveraging user communities helps it to "get out of the building and connect to the marketplace. The principles of innovation are based on the belief that innovation occurs out there just as much as it occurs in here" (Banks and Daus 2002, p. 184). The shift in the locus of innovation from firm-centric networks to user-centric networks (e.g., customer-initiated thematic communities) in certain industries (e.g., software, medicine, financial services, pharmaceuticals) constitutes an area for further research.

### CONCLUSION

The growing interest in the role of customers as co-producers is a consequence of the emergence of standardized and inexpensive communication networks (e.g., the Internet). Such macroenvironmental trends notwithstanding, the extent to which customers participate with the firm in co-creating value depends, as outlined in this chapter, on a host of factors. Whereas customer participation in the case of a live music concert is limited to the extent of the customer being present to experience the performance, a personal fitness program would entail greater customer participation in co-producing the desired outcome. This chapter highlights the extent of customer participation in a firm's core business processes and/or value chain activities and their implications for enhancing the effectiveness of marketing strategy and efficiency of marketing operations. We hope that the issues highlighted here also provide the impetus for further debate and discussion.

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