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Solutions-Driven Marketing

Navigating the maze of options and providing a link between product customization and e-commerce.

The Internet and the Web provide an electronic infrastructure that has changed the operational and strategic dynamics of many businesses. As an electronic medium, the Web facilitates interactive selling approaches such as auctioning and market-making. The Web also facilitates personalized marketing whereby information and product offerings can be tailored to individual customer preferences [3, 4]. Moreover, it allows customers to easily gather, retrieve, and analyze product information [7]. Ultimately, the Web provides the ideal vehicle for delivering online analytical tools directly to customers; yet most commercial Web sites do not make use of such customer decision support systems.

A customer decision support system (CDSS) has long been viewed as a promising selling tool, but until recently, one with limited application. Now, a CDSS has the ability to offer significant value to the entire customer decision-making process [8], especially in the Internet era of self-service, configure-to-order buying. The complexity of configuring and selecting the customizable goods and services sold on the Web suggests there is particular value in an interface that guides and directs customer choices. With a focus on such a Web-based interface, the value of a CDSS is framed here within a solutions-driven approach to marketing complex and customizable products.

The well-known successes of companies such as Dell Computer emphasize the importance of the Web as a medium for marketing and selling customized products. Not only does the Web enable customer input and the online specification of choices from among a set of products and attributes, but the Internet also provides an infrastructure for data communication that enables custom-configured online orders to be efficiently fed into production. Assisted by other IT-enabled production and planning processes, manufacturers can effectively mass customize and market products to meet individual customer needs. Web-enabled customization also extends to the service industry, where increasingly common personalized marketing efforts such as Charles Schwab's "MySchwab" (www.schwab.com) provide a front end for the custom selling of services. In many ways, an e-commerce strategy is an important enabler of a product customization strategy. As illustrated in Figure 1, the importance of this strategic interrelationship is emphasized by the extent to which Web-enabled customization translates into increased profitability not only due to product customization, but also due to the Web-assisted marketing of customized products [4].

The cost savings from Web-enabled customization follow from two sources. Customization can reduce inventory levels and, as exemplified by Dell's build-to-order strategy, enable comparatively lower inventory costs. The automated sale of customized products can also greatly reduce marketing time and cost. For instance, Bally Engineered Structures, a manufacturer of custom-made storage units, was able to reduce sales and ordering time from weeks to just hours by employing artificial intelligence software to capture the decision rules of its configuration experts [9]. Such efficiency decreases the cost of selling by automating the expertise of sales representatives, thus reducing labor expense. These savings can be magnified in a Web-based environment by empowering the

customer to manage the purchase process.

The time efficiencies due to Web-enabled customization also can foster improved customer satisfaction and price premiums. Such revenue enhancement opportunities are the primary motivators of a product customization strategy [9]. One study [5] showed that, in the context of product variety, customer satisfaction is determined in part by the ease or difficulty of the process by which a customer makes choices. Another study [2] showed individuals were willing to pay more for a product when it took less effort to evaluate, particularly when the individuals were less skilled at the evaluation task. Product variety and choice have the potential to add significant complexity to the selling process, thus making the process more difficult for the consumer. Confusion from the complexity of customization might even lead to purchase abandonment. Thus, it is important to go beyond the offering of a huge variety of customized options and to efficiently guide customer efforts to the particular solutions that best meet their needs.

User effort considerations have been found to have a major impact on the use of decision support tools [10]. In particular, decision support can be used to reduce the complexity and effort often associated with the purchase of a customized product. In this context, decision support or configuration tools often are employed by sales representatives; but with universal access to the Web, the deployment of online support tools is not limited to the sales force. For example, Dell manages its corporate customer relationships via customized Web pages. As an electronic selling channel, the Web affords companies a unique opportunity to embed decision support tools into an online interface. In turn, the online support of customer decision making can facilitate a solutions-driven approach to marketing.

Solutions-Driven Marketing and Selling

Solutions-driven marketing arises from a "needs-based" approach to selling. Such a strategy of identifying the needs of a customer and then recommending a product to meet those needs is common in the financial services industry. For instance, needs-based selling is important to achieving a balanced enrollment in voluntary group insurance plans, where the goal is to reach beyond those who already understand (and are most likely to consume) the benefit. Needs-based selling also is important to the cross-selling of banking products, where the use of one product (such as maintaining a high average balance in a checking account) might suggest the opportunity to sell another product (such as mutual funds). In the context of any complex good or service, an assessment of needs will serve to guide customers toward solutions appropriate to their situations.

Figure 1. Paths to profitability through Web-enabled customization.
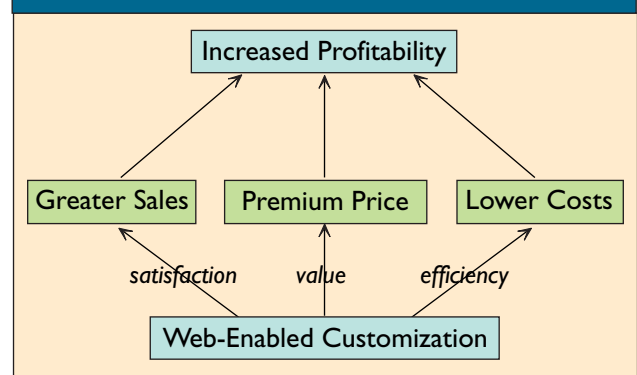
Figure 2. Solutions-driven marketing as a missing link.
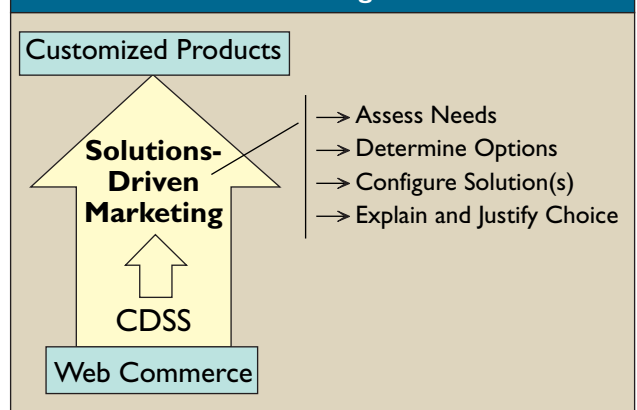
Since the needs-based approach is an effective strategy for marketing a complex good or service, it would be particularly useful with respect to configuring and marketing customized products. At a general level, customers may recognize the need to purchase a product; but they may not be able to determine the specific product features required. By identifying the needs of a customer, product options can be better determined and a solution can be more appropriately configured. In addition, even if customers understand their need for certain options, they might not understand the process required to configure the correct solution or to make the best product choice. Thus, configuration and selection are important standalone stages with respect to the selling of a customized product. As depicted in Figure 2, solutions-driven marketing and selling encompass all of these stages of the custom purchase process, each of which can be supported by a CDSS that can be deployed via a Web interface.
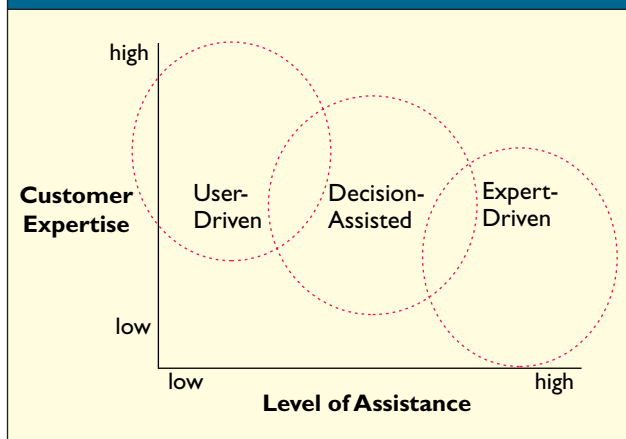
Solutions-driven marketing offers a value-added link between Web commerce and product customization. Today, such a link rarely is utilized in a comprehensive manner; though there are some Web sites that employ needs-based selling tools. For example, Schwab's site offers investment and retirement planning advice that

includes translating a customer's risk preferences into a recommended allocation of assets. However, the recommendation is generalized to broad categories of investors and it is disconnected from individualized monetary needs. Moreover, it stops short of naming specific financial products that might meet those needs. Conversely, Dell's site (www.dell.com) recommends specific computer configurations and models, but the recommendations are based upon broad categories of customers and the site relies a great deal upon the customer's ability to configure an appropriate solution. Although these examples are among the most successful commercial Web sites within their respective product classes, they still have not harnessed the full capabilities of Web-enabled customization to comprehensively assist the consumer in evaluating options, configuring solutions, and making a final purchase.
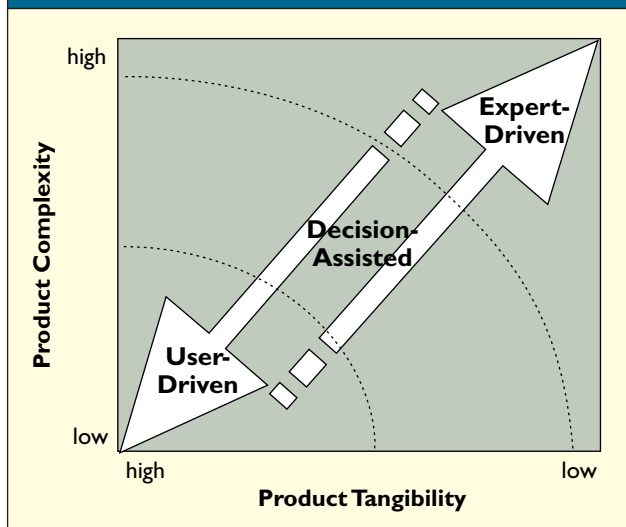
At the most comprehensive level of support, Web-

Figure 3. Interface design relative to customer expertise.

Figure 4. Interface design relative to purchase complexity.

assisted needs-based selling should build on information specific to individual customers and their anticipated use of the product. To that end, it should not rely simply on customer input regarding stated preferences for product features. Rather, it should guide customers to appropriate solutions in a manner analogous to an expert recommendation. The needs-based approach also should explain and justify a recommended solution so the customer can understand the selected configuration, particularly if the needs were identified for—not by—the customer. For example, Schwab's Web site concludes the risk profiling process by describing asset allocation plans in terms of relevant types of investors and their goals. Fittingly, the process does not rely on customers to characterize their own risk tolerance; rather it utilizes questions that ask how the customer would behave under certain circumstances (for example, if the stock market dropped 25%).

Web-Assisted Marketing Strategies

Solutions-driven marketing strategies can be implemented along a continuum characterized by three types of Web-based customer decision support: expert-driven, decision-assisted, and user-driven (see the sidebar "Approaches to Web-Enabled Customer Decision Support"). With a user-driven interface, customers specify the product options they want based on information provided by the vendor. The decision process is almost entirely in the hands of the user. With a decision-assisted interface, customers specify what features they want in a product and the system helps to narrow the available choices and suggest configured solutions. With an expert-driven interface, customers provide information about themselves and how they will use the product, and the system recommends configured solutions from which the customer can make a choice.

Since the three types of interfaces vary in the degree of assistance offered, each may be appropriate to different customers depending upon their level of product knowledge. In addition, certain interface designs may offer advantages and disadvantages depending upon the nature of the product being sold [6]. Therefore, interface effectiveness can be considered relative to both customer expertise and purchase complexity.

Customer Expertise. Figure 3 positions each type of interface with respect to the level of assistance it offers and denotes the best fit (the oval regions) relative to the expertise of the customer. The effective domain of each strategy overlaps the next, suggesting there are a variety of approaches that may be appropriate across a range of customer experiences and expertise. In general, a novice needs more assistance and an expert requires less. As such, a passive interface that offers minimal guidance or advice may be ineffective for a novice; and

an active interface that offers a lot of assistance may be annoying and inefficient for an expert. Thus, the explicit consideration of target customers and their level of knowledge can offer important insights into the appropriateness of alternative interfaces.

Consider the problem of needs assessment in the purchase of a personal computer. Customers with limited computer expertise may not understand the relationship between the intended uses of a PC and the specific technical capabilities required to support that use. This emphasizes the value of an expert-driven needs assessment based upon information about a customer and the intended use of the product. Thus, custom PC builders might go beyond the idea of matching a configuration to a general type of user (personal, corporate, home office) and instead infer customers' needs from more specific information. Such an expert-driven inference could be based on a customer profile (including information such as age, education level, occupation, income, hobbies, number of children, and so forth) as well as intended uses of the PC. Ultimately, PC "e-tailers" with a substantial home-user customer base should emphasize an expert-driven interface for assessing needs. Yet today, most PC e-tailers focus more on a user-driven strategy, leaving customers to make complex choices with limited assistance or guidance.

Approaches to Web-Enabled Customer Decision Support

The degree of online support for a custom purchase is reflected in the interface design of a Web-based CDSS. As depicted in the accompanying figure, the level of support is determined by the point at which the CDSS is applied to the purchase and selection process. "User-driven" support is relevant to the end of the process. It assists with the specification and configuration of product options, relying on the assumption that users are able to determine the options they require. Conversely, "expert-driven" support assumes no user expertise, so it initiates the selection process with a needs assessment based on a description of the customer and/or the intended use of the product. In between, "decision-assisted" support assumes customers are capable of specifying their needs, so it begins by translating those needs into specific product options.

User-driven interfaces offer a basic level of support by employing configuration tools such as constrained menu choices to facilitate user selection of product options. Decision-assisted interfaces provide more comprehensive support by using a DSS to help customers choose the options or configurations that fulfill their needs. A model-based DSS would analyze and summarize information to assist the customer in making choices. Expert-driven interfaces provide the most comprehensive level of support by using an expert system (ES) to perform needs assessments and to offer recommendations. An ES would simulate the judgment of an expert in order to recommend configured solutions. Each type of interface is further explained here.

Expert-Driven. For comprehensive needs-based selling, a set of rules serves to interpret customer-specific information or intentions into a recommended product configuration. The interpretation requires intelligence (such as an asset allocation model that determines investment profiles) to be built into the Web site. The use of an expert model or system can be likened to the use of an intelligent agent that searches the Web for a product that matches customer-specific requirements. Such agents can provide the basis for an Internet-wide "interactive home shopping" system.[1] Likewise, expert-driven recommendations can provide the basis for configuring and selling customized products. In particular, expert-driven assistance can uncover individual needs so as not to rely on customer expertise or product knowledge.

While a comprehensive expert-driven approach is not common, online investment sites favor such an approach. Financial Engines (www.financialengines.com), an online provider of automated 401(k) planning, uses a sophisticated model that generates thousands of economic scenarios based on an individual customer profile. Not only does the model make specific recommendations for allocating assets across actual investment products, the recommendations also are customized to specific retirement goals, risk tolerances, and available investments.

Decision-Assisted. Another category of tools can serve to translate customer preferences into alternative product configurations. In this context, the customer—not the system—would identify preferred features or capabilities. A variety of choice models, including conjoint analysis, decision trees, and other preference-oriented methods, could be used to support such a process. A DSS can consider the relative compatibility between preferences and features and could map customer preferences to compatible product features and configurations. In addition, preferences can be weighted based upon their importance to the customer.

Although not widely used to sell products on the

[1]Alba, J., Lynch, J., Weitz, B., Janiszewski, C., Lutz, R., Sawyer, A., and Wood, S. Interactive home shopping: Consumer, retailer, and manufacturer incentives in electronic marketplaces. *Journal of Marketing* (July 1997), 38–53.

Purchase Complexity. Further insight into the effectiveness of an interface can be gained by looking at the complexity of the purchase process. The complexity of purchasing a customized product depends on a number of factors that can combine to make finding an appropriate solution more difficult. The complexity of the product and the tangibility of the solution should be considered as two important dimensions of purchase complexity. As summarized in Figure 4, an increase in the amount of product complexity or a decrease in tangibility corresponds to the need for more assistance from the selling interface.

Complex products with a large number of configurable components may require expert-driven techniques that use customer preferences to filter out irrelevant or undesirable choice options. When the set of options is small, a user-driven approach may be sufficient. At the same time, if there are significant relationships in component choice where the effectiveness of one component is dependent upon the choice of another, then complexity can increase dramatically. In such circumstances, expert-based assistance may be most appropriate for determining the viability of different attributes and the associated performance of the resulting product or service. Consider a telephone plan where long-distance service providers offer expert advice

Web, decision-assisted selling has been effectively employed by online reservation brokers. For instance, Travelocity.com offers customized searches of the Sabre reservation system allowing customers to specify not only dates and locations, but also preferences with respect to cost, schedule, and airline. Solutions

assist customers by guiding them through the selection of product features. In this context, users specify the needed product attributes and options while the system guides the purchase process to feasible solutions. Drop-down lists of options often are accompanied by hypertext explanations of product features.

This user-driven process can be enhanced further by dynamically formulating menus of potential options based upon previous selections.

Dell and other computer sellers utilize these online tools to provide user-driven customization alternatives to their decision-assisted Web strategies. Not only does a user-driven interface allow customers to build a self-designed PC, it also provides for a self-guided design process. However, the complexity of PC components requires significant user knowledge of product and configuration options. In that respect, a user-driven approach perhaps is

Levels of customer decision support.
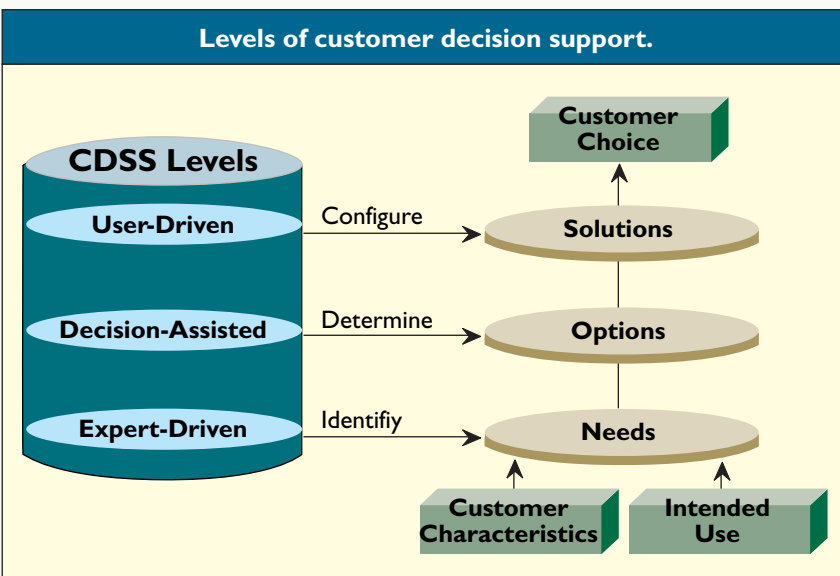
(specific flights) are suggested to the customer and prioritized with respect to the degree to which they meet the specified needs. American Express (www.americanexpress.com) offers another example of decision-assisted selling with a "Help Me Find My Perfect Card" tool that asks customers to specify preferences with respect to reward programs, billing features, and credit line. The Web site provides alternative solutions (specific cards) as well as explanations of the alternatives.

User-Driven. At a basic level of support, online order forms with pull-down menus often are used to

best suited to customizable products consisting of simple, easy-to-understand components.

User-driven configuration tools represent a common form of support for the Web-based marketing of customizable products; but such tools provide only a basic level of customer decision support. Decision-assisted and expert-driven interfaces offer more comprehensive support to the custom purchase process. Frequently overlooked, these types of interfaces represent an opportunity to harness the power of the Internet to effectively market a variety of customizable products to a variety of customers. **C**

to determine the most cost-effective plan based upon a customer's previous usage.

Complexity—and the need for an expert-driven interface—also can increase when there are a large num-

Figure 5. Positioning Web storefronts.

	Manufacturer	Broker	Service Provider
high	Custom PC Builders	Investment Brokers	Web Site Designers
	Clothing Outfitters	Ticket Agents	Banks
	Automobile Dealers	Book Sellers	Educational Institutions
low	Card Shops	Auction Houses	News Providers

Product Complexity (vertical axis)

good — **Product Type** — service

ber of alternative products or services to consider. For example, since Internet booksellers offer enormous product variety, their customers face significant complexity in making a product choice. Consequently, Amazon.com employs a tool that generates expert-driven recommendations based upon customers' opinions of previously read books. With mechanisms already in place to search for books by subject or author, a decision-assisted interface also could be employed to generate recommendations that take into account preferences with respect to price, length, year, and other attributes. Barnesandnoble.com offers such a multifeature search of their network of out-of-print book dealers so that a customer can specify preferences for first editions, dust jackets, and signed copies.

A decision-assisted or expert-driven interface is particularly important when a customer is choosing among alternative suppliers where a large number of potential solutions may not be described in a consistent way. In such cases, expert-driven systems may be required to guide the customer toward a common language of expression for comparing alternatives. For example, online real-estate brokers such as Realtor.com offer a common format for finding and comparing houses based upon preferences for a wide variety of interior and exterior features, price, and floor plans. Conversely, Internet auction sites such as eBay generally employ traditional methods of searching for specific features within the product descriptions. In this case, a lack of consistency in wording can result in an ineffective search and comparison.
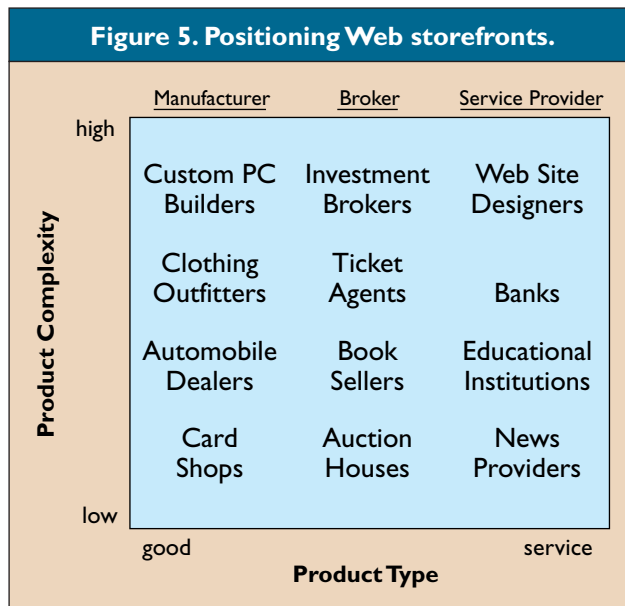
In addition to generating the best product choices for customers, expert interfaces must be able to explain why the choices are suitable. This capability has been found to be essential to the acceptance of online expert advice [1]. As such, expert-driven and decision-assisted strategies must go beyond product descriptions when justifying a customized solution. For example, with reviews and synopses accompanying each title, Internet booksellers have a built-in mechanism for describing recommendations; but these e-tailers could provide a more direct justification by explaining why a book is on a recommended list. Explanations are particularly important given a recommendation based on product attributes that are intangible. Since the tangibility of the product influences how readily it can be described and understood, interface design choices may need to differ for goods and services with different levels of tangibility. Less-tangible products are more difficult to describe and understand, thus they would tend to require more of an expert-driven interface. Therefore, decreased tangibility corresponds to the need for more assistance from the selling interface.

Although expert-driven selling provides the most powerful interface, it is not always the most appropriate strategy. For instance, it may not make much sense to recommend a custom-equipped car based on an individual's lifestyle, but it still may be beneficial to assist the customer's decision-making process. Yet automobile manufacturers and dealers generally limit themselves to a user-driven Web interface such as the "Interactive Pricing Center," a tool that Saturn Corporation had employed on their Web site (www.saturn.com). Given the customer-centered business model of Saturn, a decision-assisted selling strategy might offer some value. Such an interface could generate a custom-equipped model based on preferences involving price, power, safety, and other features. In this context, a decision-assisted interface might be combined with a user-driven interface to provide a recommended configuration as a starting point for further customization. In fact, Saturn now employs a "Help me find the right Saturn" tool that feeds into a "Design and Price" tool.

Transforming Marketing and Selling

As a step toward identifying how specific businesses might exploit the power of solutions-driven customer interfaces, Figure 5 considers the positioning of some of the most common Web businesses with respect to the nature of the product being sold. These businesses are grouped into three broad categories: manufacturers who sell goods directly to consumers, brokers who facilitate the purchase of goods or services they do not themselves produce, and service providers who offer services that

may be consumed online. Each of these groups may exploit the Internet in a different way depending on the types of goods and services they sell and the nature of the customer base they sell to. However, Web sites can be transformed in order to better exploit the interactive medium of the interface [11].

In particular, all of these businesses may be able to employ a Web-based customer DSS to transform the nature of the products they sell by focusing on bundled solutions as opposed to individual items. Such bundling would lead to goods or services being treated as customizable packaged solutions rather than standalone products. For instance, an education is not just a course—it is a customized collection of courses that accomplish a learning objective. In this context, learning objectives might be identified through a needs-based assessment of an individual; and a decision-assisted tool might help to configure a plan of coursework. Similarly, banking is more than just checking and savings accounts—it is a collection of cash and asset management services. As such, online banks might utilize an expert-driven or decision-assisted interface to help customers create a customized portfolio of financial products.

A holistic solutions approach is common among certain types of brokers. For example, airline reservations are based on a customized collection of flights that serve to transport a customer from one location to another. At a more advanced level, investment firms provide advice on creating a customized portfolio of investments. In fact, as a financial service, investing can be combined with banking so a company such as Bank of America (www.bankofamerica.com) offering both types of products can fully exploit a Web-enabled customization strategy. Given the right interface, customers would be able to manage almost all of their financial needs. By using a customer-based DSS to bundle service solutions together, organizations can further reinforce the marketing power of their Web interfaces.

The clothing industry provides an example in which retailers can exploit a holistic product strategy. Mass customized clothing first gained attention when Levi Strauss and Company began manufacturing made-to-order, custom-fitted jeans under the "Personal Pair" label. Now, clothing e-tailers can pursue a customization strategy by thinking in terms of outfits and wardrobes as opposed to individual articles. For instance, Lands' End has become part of the customer process by providing customized recommendations with the help of a "Personal Shopper" Web interface (www.landsend.com). The interface begins by creating a personal profile based on a customer's preferences for certain outfits. Then, after the customer creates a dressing model by choosing among several body shapes, skin tones, and hair colors and styles, the expert-driven interface can recommend outfits appropriate for the model. In essence, Lands' End has exploited the electronic medium of the Web to become an assembler of outfits, thus positioning the business as a custom "outfitter" (in a sense, a manufacturer) as opposed to just another e-tailer.

By enabling custom bundling, Web-based interfaces and customized sales support provide opportunities for increased revenues without a significant increase in transaction costs. Ultimately, the value of a solutions-driven interface is magnified by a company's Web-enabled customization strategy. Once the domain of an expert sales staff and appropriate only for complex, high-end, high-margin products, customized marketing through decision support technologies can be made much more widely and more economically available to consumers. As such, the Web can offer more than just promotion, electronic order forms, and data transfer—it can facilitate the use of decision support tools that actually configure or define the product based upon individual customer needs, thus guiding the purchase process toward effective solutions. Such a solutions-driven approach can be an important way to differentiate an organization's Internet sales strategy—an opportunity organizations have only begun to exploit. **C**

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