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Rethinking customer solutions: From product bundles to relational processes

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Rethinking Customer Solutions: From Product Bundles to Relational Processes

This study draws on depth interviews with 49 managers in customer firms and 55 managers in supplier firms and on discussions with 21 managers in two focus groups to propose a new way of thinking about customer solutions. Extant literature and suppliers interviewed for this study view a solution as a customized and integrated combination of goods and services for meeting a customer's business needs. In contrast, customers view a solution as a set of customer–supplier relational processes comprising (1) customer requirements definition, (2) customization and integration of goods and/or services and (3) their deployment, and (4) postdeployment customer support, all of which are aimed at meeting customers' business needs. The relational process view can help suppliers deliver more effective solutions at profitable prices. In addition, field research suggests that the effectiveness of a solution depends not only on supplier variables but also on several customer variables. Supplier variables include contingent hierarchy, documentation emphasis, incentive externality, customer interactor stability, and process articulation. Customer variables include adaptiveness to supplier offerings and political and operational counseling that a customer provides to a supplier. Several of these variables underscore the importance of suppliers developing social capital with customers. The authors discuss implications for solution suppliers and identify areas for further research.

> The winners will be those who deliver *solutions* from the users' point of view. That is a big part of *marketing's* job.
> —Jack Welch (Kumar 2004, p. 84, emphasis added)

Faced with intense competition, firms in diverse industries, such as information technology, chemicals, and financial services, are attempting to differentiate themselves by offering customer solutions (see Court, French, and Knudsen 2006; Wise and Baumgartner 1999). According to one report, 63% of *Fortune* 100 firms offer solutions rather than just predeveloped goods or services (Day 2004; Sharma, Lucier, and Malloy 2002). The move toward providing solutions mirrors the shift on the part of customers to outsource or "rent" access to expertise, goods, networks, and systems (Lovelock and Gummesson 2004). Customer solutions embody the new service-dominant logic (Vargo and Lusch 2004), represent a critical shift in product development (Srivastava, Shervani, and Fahey 1999), and present new challenges for choice models (Dhar, Menon, and Maach 2004).

What is a customer solution? The predominant view in the literature is that a solution is a customized and integrated combination of goods and services for meeting a customer's business needs (e.g., Davies, Brady, and Hobday 2006; Sawhney 2006). Notably, there is little evidence to suggest that this view reflects or is informed by how customers think about solutions. This is noteworthy because the purpose of a solution is to address a customer's business needs. If customers viewed solutions differently, it would require that suppliers rethink what they sell to, develop for, and provide their customers. Accordingly, the first objective of this study is to compare and contrast the extant view in the literature with that of suppliers and customers of solutions and to identify their implications for suppliers.

There is evidence to suggest that it is not easy for suppliers to provide effective solutions that are also profitable. For example, a recent survey of 200 executives at *Fortune* 1000 firms reports that about half of solution providers realize only modest benefits, and 25% actually lose money (Stanley and Wojcik 2005; see also Johansson, Krishnamurthy, and Schlissberg 2003). Indeed, Day (2004) concludes that the complexities of developing solutions are difficult to master and even more difficult to copy. Therefore, the second objective of this research is to develop insights into the variables that affect a supplier's ability to provide effective solutions to organizational customers.

Given the relatively sparse literature on the subject, we used a discovery-oriented, theories-in-use approach (e.g., Bendapudi and Leone 2002; Zaltman, LeMasters, and Heffring 1982). We conducted depth interviews and focus group discussions to tap into the insights of managers with

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experience as customers or suppliers of solutions. This study makes two key contributions: First, the study reveals that whereas the extant literature and suppliers tend to have a product-centric view of customer solutions, customers tend to have a relational process view of solutions. Consistent with extant literature, suppliers tend to view a solution as a customized, integrated bundle of goods and services (e.g., Galbraith 2002; Sawhney, Wolcott, and Arroniz 2006). In contrast, customers tend to view a solution more broadly as a set of customer–supplier relational processes comprising (1) customer requirements definition, (2) customization and integration of goods and/or services and (3) their deployment, and (4) postdeployment customer support. The difference in the two perspectives sheds light on why many suppliers underemphasize relational processes that customers consider crucial, such as requirements definition and postdeployment support. Suppliers' inattention to these processes arguably results in lost sales opportunities, dissatisfied customers, and lower profitability. This study suggests that solution providers could benefit from supplanting their product-centric view of solutions with a relational process view.

Second, the study addresses scholars' calls to identify specific variables that influence the effectiveness of a solution (e.g., Sawhney 2006). It emphasizes that solution effectiveness depends not only on supplier variables but also on customer variables. The study identifies supplier variables that have not been studied to date, such as contingent hierarchy and customer interactor stability. In addition, it elaborates on the customer's role in developing effective solutions, a topic infrequently discussed in the literature. Several customer variables, such as a customer's willingness to adapt to a supplier's offerings and to offer guidance into its political and operational environment, are identified as determinants of solution effectiveness. Importantly, the supplier and customer variables we identify are under managers' control and, therefore, are of direct importance to both solution providers and customers.

Research Method

Sample

Given the relatively sparse literature on solutions, we adopt a discovery-oriented, theories-in-use approach (e.g., Glaser and Strauss 1999; Zaltman, LeMasters, and Heffring 1982). We used a purposive or "theoretical" sampling procedure to recruit managers across functions and hierarchal levels in multiple industries (e.g., Bendapudi and Leone 2002; Kohli and Jaworski 1990; Menon et al. 1999). To recruit participants, we used the Dun & Bradstreet Million Dollar Database, contacts obtained from the Institute for Study of Business Markets, and personal contacts. We collected data over a one-year period, expending significant amounts of the time to gain access to managers with relevant experience as customers or suppliers of solutions.

We collected data from both customer and supplier organizations. Specifically, we conducted depth interviews with 49 managers from 25 firms involved in purchasing, deploying, and/or using solutions (customer organizations) and 55 managers from 29 firms involved in selling, developing, deploying, and/or supporting solutions (supplier organizations). In addition, we conducted two focus groups with 21 managers from 19 supplier firms in several industries. The interviews lasted between 21 and 95 minutes each, and the two focus group sessions lasted approximately 50 minutes each. The study participants had significant amounts of work experience and reflected a wide distribution of hierarchical levels, functions, and industries (see Table 1).

TABLE 1
Sample Characteristics

		Supplier Participants		Customer Participants
		Interviews	Focus Groups	Interviews
1. Title	CXO[a]	13	1	19
	Vice president	9	4	11
	Others	33	16	19
2. Experience (years)	Range	4–39	6–28	3–40
	Average	21.5	11.9	16.98
3. Functions	Marketing	15	3	10
	Sales	17	3	7
	Operations/information technology	16	10	20
	Finance/accounting	5	5	6
	Human resources	2	0	6
4. Industry (number of firms)	Information technology	12	9	10
	Health care	5	3	2
	Real estate	3	1	1
	Financial services	6	3	1
	Other	3	3	11

[a]CXO includes titles such as chief executive officer, chief information officer, chief marketing officer, chief finance officer, and chief operating officer.

Data Collection and Analysis

We used a structured set of questions for the interviews and focus group discussions (see the Appendix). The questions were carefully worded to elicit participants' responses in a nondirective manner to avoid "active listening" (McCracken 1988). Although the questions provided a general framework, they were followed up with additional questions requesting clarifications, examples, and more details into potentially interesting ideas. The participants declined requests to record interviews because of the sensitive nature of the subject. As such, we took detailed notes during the interviews. However, we audiotaped the focus group discussions.

As the data collection process progressed, we reviewed the notes from the interviews and focus groups and, in joint discussions, defined emerging ideas, identified specific themes, and highlighted directions for the subsequent field research. When the notes revealed insightful ideas, we contacted interviewees a second time to verify the accuracy of their comments and to obtain permission to quote them.

We based participants' insights and the themes we selected for discussion in the next section on three key criteria:

1. Is the idea or insight applicable beyond a specific context, such as firm or industry?
2. Did multiple participants mention the idea (see Bendapudi and Leone 2002)?
3. Does the idea go beyond the "obvious" to provide more interesting and useful conclusions (see Kohli and Jaworski 1990)?

Thus, we do not include ideas that are industry specific or mentioned by only one participant. For example, a supplier noted the importance of flexible source-code software as an enabler of effective solutions. We do not discuss this idea, because it is specific to the software industry and only one participant mentioned it. Similarly, we refrain from discussing obvious ideas, such as the need for talented employees; instead, we focus on factors that are not discussed in literature, such as contingent hierarchy.

Table 2 lists major themes that emerged from interviews with customers and suppliers. Two independent judges were given interview notes and were asked to verify the accuracy of the themes we identified from the field data. We assessed interjudge reliability by the proportional reduction in loss for 40 randomly selected customer and supplier interviews. The proportional reduction in loss in the current study is .82, which is well above the .70 cutoff recommended for exploratory research (see Rust and Cooil 1994). On the basis of the themes that emerged from the field research and ideas in the extant literature, we propose a new perspective on the concept of a customer solution and identify factors that influence solution effectiveness.

The Concept of a Customer Solution

Extant View

Table 3 summarizes the definitions of a customer solution that appear in the academic and practitioner literature. There are three commonalities across these definitions. First, a solution involves a combination of goods and services. Second, the goods and services in a solution are designed (or modified or selected) to address a customer's particular requirements; that is, they are customized. Third,

TABLE 2
Frequency of Themes Mentioned by Participants in Depth Interviews

Themes		Frequency: Suppliers (n = 55)	Frequency: Customers (n = 49)	Z Test of Proportions
Concept of customer solutions				
	Requirements definition	4 (7%)	37 (76%)	7.10*
	Customization and integration	40 (73%)	42 (86%)	1.62
	Deployment	2 (4%)	42 (86%)	8.46*
	Postdeployment support	2 (4%)	45 (92%)	9.02*
Supplier variables that influence solution effectiveness				
	Contingent hierarchy	11 (20%)	11 (22%)	.31
	Documentation emphasis	10 (18%)	3 (6%)	1.86
	Incentive externality	23 (42%)	10 (20%)	2.34*
	Customer interactor stability	4 (7%)	11 (22%)	2.19*
	Process articulation	15 (27%)	9 (18%)	1.07
Customer variables that influence solution effectiveness				
	Customer adaptiveness	1 (2%)	21 (43%)	5.11*
	Political counseling	5 (9%)	15 (31%)	2.78*
	Operational counseling	3 (5%)	19 (39%)	4.15*

*Absolute value of Z is greater than the critical value at $p \leq .05$.

TABLE 3
Extant Views on the Concept of a Customer Solution

Foote et al. (2001)	"In all sorts of industries, companies that traditionally have made and sold stand-alone products are changing their strategies. They are creating high-value solutions by integrating various products and services." (p. 84)
Galbraith (2002)	"A recent trend in business strategy is to offer solutions to customers instead of stand-alone products. The companies following a solution strategy bundle their products together and add software and services." (p. 194)
Johansson, Krishnamurthy, and Schlissberg (2003)	"A solution is a combination of products and services that creates value beyond the sum of its parts…, it is the level of customization and integration that sets solutions above products or services or bundles of products and services." (p. 118)
Brady, Davies, and Gann (2005)	"Recent business literature has shown how some of the world's leading firms have been changing their strategic focus to compete by providing solutions rather than individual products or services (Bennett, Sharma, and Tipping 2001; Cornel et al. 2000; Davies et al. 2001; Foote et al. 2001; Sharma and Molloy 1999; Slywotsky 1996; Slywotsky and Morrison 1998; Wise and Baumgartner 1999). This trend has particularly affected the high value, engineering and software-intensive capital goods sectors, where firms design, integrate, and deliver complex products and systems (CoPS) on a project basis in small batches or as one-offs for business users, operators, service providers and/or government agencies (Hobday 1998; Miller et al. 1995)." (p. 360)
Sawhney (2006)	"I define a solution as an integrated combination of products and services customized for a set of customers that allows customers to achieve better outcomes than the sum of the individual components." (p. 369)
Sawhney, Wolcott, and Arroniz (2006)	"A solution is a customized, integrated combination of products, services and information that solves a customer's problem." (p. 78)
Davies, Brady, and Hobday (2006)	A solution "involves the provision of tailored combinations of products and services as high-value 'integrated solutions' that address the specific needs of large business and government customers." (p. 1).

each good or service in a solution must "work with" other goods and services in the solution; that is, a solution consists of an integrated set of goods and services.

The majority of suppliers we interviewed for this study also view a solution as a customized and integrated combination of goods and services (see Table 2). For example, the head of solutions development at a supplier noted,

> Solutions are a complex combination of hardware, software, and services that are customized from a customer's viewpoint, are aimed at solving a customer's business problem, and are integrated to perform as a system.

Other supplier interviewees offered parallel ideas:

> Solutions are [a] combination of products and services that are integrated and customized to solve the specific business problems of customers. (Marketing manager, *Fortune* 500 firm)

> Remember, solutions are not a one-size-fits-all. There are no cookie cutters involved…. Solutions require customers who are open to the idea of considering the benefits of customization and formation of integrated systems. (Vice president of communications, information technology services firm)

To summarize, both the extant literature and the suppliers we interviewed view a solution as a bundle of products that are customized and integrated to address a customer's specific business needs. (Note that consistent with prior literature, we use the term "products" to refer to goods and/or services.)

Proposed View

In sharp contrast to the view that is dominant in extant literature and among suppliers, most customers view a customized and integrated bundle of products as only a part of a solution and, even then, not the most frequently mentioned part (see Table 2). As a senior manager at a customer asserted,

> A solution to me is when a supplier proposes bringing in value beyond the widgets. Rather than saying that here is a widget for $10, it's more about finding what I really need, figuring out the widgets that will be required, making sure that the widgets meet my requirements and work well with each other, bringing these widgets into my business, and making sure that they are around to ensure that the widgets do what they were required to do. It's simply soups to nuts for me.

As this exemplar quotation illustrates, customers expect a solution to include processes directed at understanding their requirements, customizing and integrating products, deploying them, and supporting them on an ongoing basis. As one customer put it,

> Some vendors could be great at conceptualizing the solution but lack the skills to execute. Others might be good at executing but not defining the requirements. For us, the

> ones that worked well were the ones who could manage the whole chain and not just one part or the other. It's important to remember that this is a complex chain, and you can't be good at it if you are working out only some parts and not the whole. If you can't have it all, it is not going to work.

As Table 2 indicates, the vast majority of customers point to four processes as essential parts of a solution: (1) requirements definition (76%), (2) customization and integration of goods and/or services (86%) and (3) their deployment (86%), and (4) postdeployment support (92%). Consistent with the work of Vargo and Lusch (2004), customers view goods such as software and hardware as mere "appliances" for serving customers. In the words of a customer (research laboratory),

> [The solution] is a fairly comprehensive set of software and attendant processes that go with it to solve a fairly broad problem addressing our business needs. It is not about a bunch of servers and software; it is about processes and procedures.

In striking contrast, few suppliers mentioned three of the four processes as parts of a solution. The frequencies with which suppliers mentioned these three processes are as follows: requirements definition (7%), goods and/or services deployment (4%), and postdeployment support (4%). Thus, there appears to be a significant difference between customers' view of a solution and that of suppliers (as well as that reflected in the extant literature) (for a summary of this discrepancy, see Figure 1). Given that the purpose of a solution is to satisfy a customer's business needs, we argue that it is useful to define a solution consistently with the views of customers. As such, we propose that a solution is a set of customer–supplier relational processes comprising (1) customer requirements definition, (2) customization and integration of goods and/or services and (3) their deployment, and (4) postdeployment customer support, all of which are aimed at meeting customers' business needs (see Table 4); we compiled these examples from descriptions the customers and suppliers provided.

Defining a customer solution as comprising four relational processes is useful for at least three reasons:

1. It is rooted in customers' views that have not been explicitly considered in prior research. Given that the purpose of a solution is to satisfy customer needs, it is desirable to define a solution from the customer's point of view.
2. Focusing on relational processes is consistent with the service-dominant logic that argues for a shift from product-centric to process-centric thinking (Gummesson 2006; Vargo and Lusch 2004) and from transactions to relationships (Ballantyne and Varey 2006; Cova and Salle 2000; Rust 2004, 2006). It implies that a solution is not just a customized bundle of products that is exchanged for a price; rather, it is an ongoing, relational process of defining, meeting, and supporting a customer's evolving needs (see Hafjikhani 1996).
3. The definition brings into sharp focus the four processes that constitute a solution from the customer's perspective. A solution provider must perform all four processes well to deliver a solution that a customer will consider effective. Indeed, Gronroos (1984) points out that in many cases, customers' perceptions of service delivery processes may be more important determinants of their assessments of service quality than the outcomes derived from the service delivery.

However, suppliers appear to define a solution primarily as a customized and integrated bundle of products. This likely leads to an underemphasis on the process, which the customers consider crucial. Indeed, several customers note that processes such as requirements definition and postdeployment support are key areas of weakness for many suppliers. As one customer complained,

> A lot of guys come in and say, "Hey, I am going to solve your problems," but how can you solve my problems, when you don't even know me?... A number of times they don't even understand my business—what I do on a day-to-day basis. It might be a great solution for them to run a million-dollar contract, but I know that they are just throwing a "cookie cutter" at me.

Similarly, speaking to suppliers' lack of attention to postdeployment support, a senior manager at a health care firm fretted,

> Support is the Achilles heel for most suppliers. They come, deliver, and go, but what happens when I am in trouble? We need solution providers, not fair-weather friends.

In the following discussion, we explicate the four processes that constitute a solution and relate them to extant literature.

Requirements Definition

Most customers note that requirements definition is a key part of a solution. However, field research suggests that this process is not as straightforward as it may appear for three

FIGURE 1
A Comparison of Extant and Proposed Views of a Customer Solution

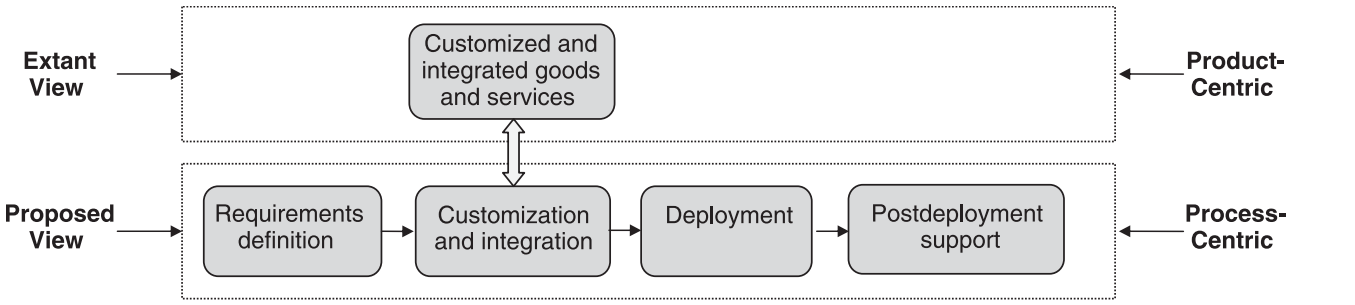


TABLE 4
Examples of Customer Solutions as Relational Processes

Supply Chain Solution for Farm Equipment Manufacturer	Sales Force Solution for Pharmaceuticals Developer	Procurement Solution for Industrial Chemicals Firm
Requirements Definition •The customer required "synchronizing the design, packaging, delivering, customs clearance, inventory management, warehousing, and shipping." •The supplier "was involved from the beginning. They were talking to our engineers from ground up. They even talked to our suppliers to get an idea of how things happen at their end."	**Requirements Definition** •Customer: "[Customer salespeople] were challenged with the problem of increasing our face time with clients." •Customer's sales supervisors and senior management needed real-time updates of sales funnel.	**Requirements Definition** •The customer requirement was for a comprehensive approach for managing the procurement of an essential but volatile and dangerous chemical. •Supplier recognizes political aspects: "If we were to deliver this to their plants, their purchasing guys needed to be comfortable with this. It was important that they did not feel threatened. That's why we asked them to be our guides, asked them for advice."
Customization and Integration •Hardware is customized to withstand high temperature and humidity in vehicles and warehouses. •The hardware and software are integrated to work as a system.	**Customization and Integration** •Supplier designs software that works well with laptops of salespeople and identifies sales strategies for different clients. •The software links up with the mainframe systems to send daily reports of sales funnel to top management.	**Customization and Integration** •The supplier develops a procurement system comprising reporting rules and technology products for purchasing, shipping, and delivering the chemical to multiple plant locations. •Supplier designs a training program to enhance skills of purchasing managers to use the procurement system.
Deployment •Supplier provides vehicles, warehouses, hardware, software, and training to customer employees. •Supplier runs trials to fine-tune the system. •Customer: "After obtaining approval of our suppliers and our engineers, they ran a couple of trials and prototypes. By the time we came to full implementation, it was just a matter of scaling things."	**Deployment** •Customer: "They trained us, gave us a lot of face time, and were accessible and responsive. It was very systematic, and we rolled out over nine months." •Software modified to accommodate migration of central system from mainframe to new technology.	**Deployment** •Supplier modifies reporting rules to address workload concerns of purchasing manager's union that arise during solution deployment in a country. •Rollout is completed across the globe after pilots work out in test countries.
Postdeployment Support •Customer: "They are responsible for running the system today and responsive to any contingencies that might happen."	**Postdeployment Support** •Supplier conducts regular workshops with salespeople to share new insights and update software and provides a 12-hour on-site response time.	**Postdeployment Support** •Supplier provides a dedicated hotline for unionized planters. •Supplier installs a satellite-based tracking system on delivery vehicles well after initial deployment.

reasons. First, customers frequently are not fully cognizant of their business needs and cannot easily articulate them to a supplier. For this reason, customers indicate that it is important for a supplier to ask the right questions and probe multiple stakeholders in a customer firm to identify its recognized and unrecognized needs. For example, the supplier of a supply chain solution held discussions with multiple internal and external stakeholders of a customer to define its requirements (see Table 4). This finding highlights the importance of developing social capital in the form of relational ties with a customer's stakeholders to generate valuable information (see Tsai and Ghosal 1998). Furthermore, several customers noted the important role of both suppliers and customers in the discovery process. In the words of a customer,

> It's about clearly identifying the problem I am facing. I might know something about it, but it's better if they can figure it out with me. Once you have figured it out, then it's about developing answers.

Second, customers point out that requirements definition is not just about asking customers for functional specifications of products. It is also about understanding a customer's broader business needs, including its internal operating processes, its labor situation, its business model, and so on. A director of campus infrastructure lamented about suppliers' failure to understand his obvious need to minimize maintenance expenses of a lighting solution:

> I need the bulbs to have a similar life span, so that I can replace them at one shot or by batch. Sporadic replace-

ment is very expensive for me. I cannot budget it well, and the labor cost of replacement is high. Also, as I changed the number of hours of utilization from 16 hours per day to 24 hours per day, I need to know the impact on the reliability of performance.

Third, requirements definition involves delineating a customer's current and future needs, such that these can be taken into account in the development of goods and services for the customer. Defining future needs is important because a customer's needs evolve over time and lead to revised customer expectations from a solution. As a health care facilities manager noted,

> Scalability is critical. Nobody wants to be stuck with a solution that is difficult to scale in the future. The vendor needs to plan out for at least three years. I bought a security solution based on [closed circuit television]. While a digital camera is currently not good enough and an analog camera is required to get a good picture, in the future, digital technology will catch up.

Customization and Integration

Most customer and supplier participants considered product customization and integration an integral part of a solution (see Table 2). This is consistent with the view adopted in the literature (e.g., Sawhney 2006). Customization involves designing, modifying, or selecting products to fit into a customer's environment. As the director of infrastructure in a customer organization pointed out,

> The solution offered has to jell with our existing system. Our existing high-performance computing cluster had 32-bit-based architecture. As we were trying to expand, one [value-added reseller] recommended a [Hewlett-Packard] server with [Advanced Micro Devices Inc.'s] 64-bit, architecture-based solution. A second one recognized our existing infrastructure and recommended an Intel-based, 32-bit solution. We felt more comfortable with the second vendor.

Commenting on the centrality of customizing products, another customer flatly declared,

> If they are not willing to change things around for me, then it is creating new problems and is not a solution.

Integration entails designing, modifying, or selecting goods and services that work well with one another. For example, the supplier of a procurement solution developed technology parts, reporting rules, and a training program that were "tuned" to one another (see Table 4). Commenting on the importance of integration, a systems analyst asserted,

> The package should be truly integrated as opposed to disparate pieces acquired to be sold together. The components should be designed together from bottom-up to seamlessly work together, and not just patched together.

Deployment

Most customers view deployment of goods and/or services as an integral part of a solution. For example, a senior manager declared,

> The proof of the pudding lies in implementation. It is a solution once it's delivered. Before that, it is all concepts and hot air.

Deployment refers to the delivery of products and their installation into a customer's environment. The installation process frequently surfaces new customer requirements that call for additional modification of products at this stage. For example, after having developed custom software for a customer, the supplier of a sales force solution later needed to modify it to conform to the customer's new requirements that resulted from its decision to migrate from a mainframe to a new technology platform (see Table 4).

Importantly, deployment processes include the management of "people aspects" in a customer firm. This involves understanding customer personnel's capabilities and providing them with appropriate information and training to enhance the utility they derive from a solution. For example, the supplier of a sales force solution dedicated some of its technical staff to understanding the customer's sales personnel and providing them with hands-on training to enhance the value they derived from the solution (see Table 4). In the words of a customer,

> It would really help if the vendor can help with increasing the utilization of the solution they sell us. We have invested a lot of money in the solution and the increased utilization will help us better justify the spending.

In a similar vein, commenting on a successful solution engagement, the general manager at an automobile distributor (customer) concluded,

> It integrated well with us. It just fit in very well with us, our people, equipment, and training requirements.

Postdeployment Support

Almost all customers interviewed for this study identify postdeployment support as a critical part of a solution. In the words of the chief financial officer at a health care firm,

> Quality of support and follow up are important for us. It does not make sense if they are here today, give you the latest and the greatest, and tomorrow they are gone. The key question I always ask myself is, Are they going to support you down the road?

Importantly, postdeployment support in the case of solutions is more than providing spare parts, operating information, and routine maintenance. Postdeployment support also includes deploying new products in response to evolving requirements of a customer. For example, long after the initial deployment, a supplier installed satellite-linked modems in a customer's trucks to enable the customer to track its shipments and provide real-time updates to its own customers (see Procurement Solution in Table 4). As a chief information officer in a customer organization pointed out,

> A solution is integrated with multiple facets in our environment. One or more of these facets can change over time. The challenge for a vendor is to respond to these changes without compromising the solution.

Customer emphasis on postdeployment support suggests that delivering solutions is better viewed as an ongoing relationship between a supplier and a customer than as a "one-off" project. This is consistent with the service-dominant logic that argues for a shift in marketing thought from transactions to relationships (Gunter and Bonaccorsi

1996; Rust 2004). Echoing this sentiment, a satisfied senior manager in a customer organization raved,

> They are there to give us updates on our network status. They are there to give us updates on security issues. They are there to cover up for us in case of disasters. They are there to cover up for us when our servers are down. They are there when we need them. They are our partners.

Factors Affecting Solution Effectiveness

Across industries, customers consider the fulfillment of their business needs a key metric for evaluating a solution's effectiveness. As the director of sourcing at a retailer elaborated,

> Is this doing what it is supposed to do? If our problem was maverick buying in different units, then does this solution ensure that integrated purchasing takes place? It might be state-of-the-art processes, etc., but in the end, if there is still maverick buying, it's just an elaborate system and not a solution.

Solution effectiveness refers to the extent to which a solution meets a customer's needs. Because a solution comprises four relational processes, solution effectiveness is a function of the extent to which (1) a customer's requirements are well defined, (2) goods and/or services are customized and integrated to address customer needs, (3) goods and/or services are deployed to address customer needs, and (4) postdeployment support is provided as the customer needs it. As a customer noted,

> Consistency across stages is very important. We don't want to fight fires at different stages. It is the whole process that matters; [it is] not good enough to be good at defining things to my requirements but not supporting us when needed.

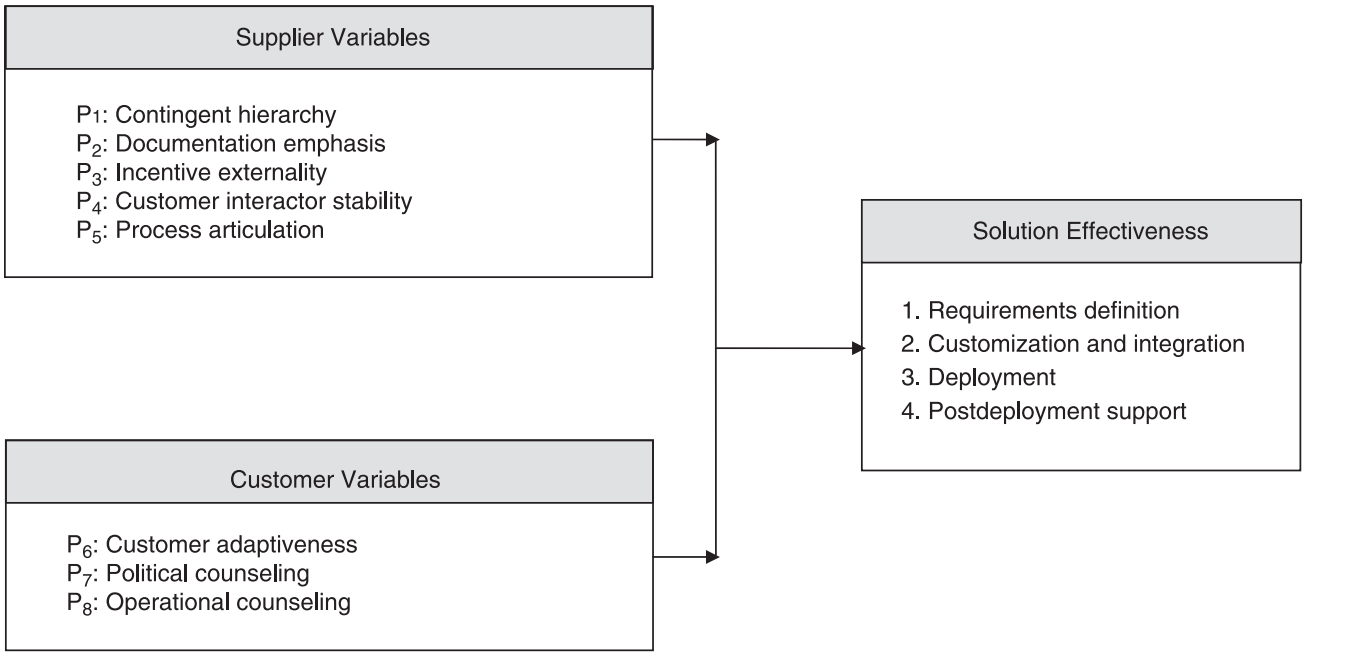
Thus, a solution's effectiveness is a function of factors that influence the effectiveness of the four solution processes. Figure 2 outlines variables that emerged from field research as predictors of solution effectiveness. Importantly, these include both supplier and customer variables. This is consistent with the cocreation perspective that is gaining momentum in the literature (e.g., Bendapudi and Leone 2003; Dahlgren and Soderlund 2001; Vargo and Lusch 2004). In the words of a customer involved in cocreating a solution,

> We took a proactive approach. We told them upfront, this is what we want. We challenged them, pushed the limits of their designs, explained to them what was needed for us today and, more importantly, where we wanted to be tomorrow so that we didn't end with a myopic solution. The key is to remember that we are not going to get the most effective solution if we are not involved in constructing the answer. After all, no one knows our business as well as we do.

Supplier Variables

As the fieldwork for the study progressed, it became clear that solution suppliers tend to have independent units (or divisions) that make and sell goods and/or services separately (and also as parts of solutions). Delivering a solution requires coordination of these independent units (or divisions). For example, a supplier of a Web site infrastructure solution must coordinate its server unit with its software unit to define customer requirements, customize and inte-

FIGURE 2
Supplier and Customer Variables Affecting Solution Effectiveness



grate the software modules with multiple servers, and deploy and support the customized and integrated servers and software modules. Coordination across independent units surfaced as a key challenge for suppliers in the course of the field research.

In addition, a solution supplier must coordinate its functions (or departments), such as sales, development, operations, and customer support. This is because different functions are typically responsible for requirements definition, customization and integration, deployment, and postdeployment support. For example, sales and development teams typically define customer requirements, with little or no involvement of the postdeployment customer support team. Indeed, customers view the lack of coordination across functions as a key weakness of many suppliers. In the words of the chief financial officer of a health care firm,

> These big conglomerates just didn't have their act together. Their people simply didn't talk to each other. I had to do their talking. It made me wonder whether I am providing them a solution or they are providing me a solution.

The field data point to several supplier variables that encourage coordination across units and functions and thus influence solution effectiveness. We discuss these issues next.

Contingent hierarchy. Firms typically have a stable hierarchical structure (i.e., stable reporting relationships; see, e.g., Rivkin and Siggelkow 2003). However, discussions with customers indicated that some suppliers adopt multiple and flexible hierarchical structures for developing solutions. Consider the experience of one customer:

> One of our vendors had a reporting structure where things moved from one project to the other. When we wanted a hosting solution, the server experts were in charge, and the software guys reported to them, but when we were looking at a portal solution, the software guys were in charge, and the server guys were reporting to them. It is a complex system to have, but in my experience, things get done well when those in the know are the ones in charge.

In this example, the superior–subordinate reporting relationship between the server unit and the software unit changes to ensure that the unit with greatest expertise in a customer's need is in charge of developing the solution. That is, the hierarchical structure between two units is contingent on the solution being developed. We term such multiple and flexible hierarchical arrangements "contingent hierarchy." Unlike changes in charters and spheres of influence of business units that Galunic and Eisenhardt (1996) discuss, changes represented by contingent hierarchy are temporary and instituted in response to the nature of solutions needed by a customer rather than broader environmental shifts. We expect that contingent hierarchy enhances solution effectiveness for three reasons.

First, a contingent hierarchy leads to employees of a unit with expertise in a customer's needs having the authority and responsibility for developing a solution. When experts are in charge, a supplier is more likely to be able to identify accurately a customer's recognized, unrecognized, and future requirements (see Bunderson 2003). As a director of information technology pointed out,

> We wanted to upgrade our systems from analogue to digital with [voice-over Internet protocol] capabilities. [The supplier] started out by allocating a team of experts to us and not just a sales guy. This was important because the complications are too much for a single or a bunch of sales guys to handle. These guys were good; they knew how to scope the engagement, figure the different touch points that needed to be integrated, and figure out what role this system plays in out daily lives.

Second, a contingent hierarchy leads to greater balance of power among a supplier's units (or divisions). Thus, in the previously cited example, the server unit enjoys power over the software unit in the case of a hosting solution. However, the power structure is the opposite in the case of a portal solution. Units are more likely to share information with each other when the power relationship between them is balanced (Lusch and Brown 1996). If units share information about their respective products with each other, it enables them to identify interrelationships among the products, which facilitates their integration. In addition, if units share customer information with each other, they develop a richer understanding of customer needs, which facilitates customization of their products (Murthi and Sarkar 2003).

Third, contingent hierarchy encourages reciprocity among units by creating a greater balance of power among them. This is likely to lead to greater overall supplier responsiveness to a customer's requests during and after deployment. For example, if the server unit is responsive to customers that request support for a portal solution (when the software unit is in charge), the software unit is likely to reciprocate by being responsive to customers that request support for a hosting solution (when the server unit is in charge), leading to greater overall supplier responsiveness. Thus:

> P_1: The greater the contingent hierarchy in a supplier, the greater is the solution effectiveness.

Documentation emphasis. Documentation emphasis refers to the extent to which supplier employees are required to document a solution's purpose, individuals' roles, work performed, and outcomes as they develop the solution. Documenting solution development for multiple customers builds a supplier's organizational memory of effective and ineffective experiences (Moorman and Miner 1997; Sinkula 1994). The supplier can draw on this memory to check whether it has fully captured a new customer's recognized, unrecognized, and likely future requirements.

Documentation emphasis also serves as a tool for managing the complexity of developing solutions. For example, as the senior systems analyst at a solutions provider asserted,

> One of the key aspects of solutions is their complexity as compared to most products. This complexity can create problems as many times, it's not clear what are the requirements, what are the goals, etc. This is especially important for solutions due to the duration of solution development and implementation. As time goes on, if things are left ambiguous, it can become difficult to stick to the objectives. Hence, in developing solutions, it is important to have rigorous documentation procedures where things are recorded explicitly.

If a unit or function in a supplier records and shares how it is designing or modifying its product for a customer, it enables other units to adapt their products accordingly to ensure that all products are well integrated. Similarly, documentation emphasis can make each unit aware of the status of other units' products and thus can help the deployment of all products in a synchronized way. For example, when deploying an e-procurement solution, a supplier can schedule customer training to coincide with delivery of servers by the hardware unit and the procurement application by the software unit.

Furthermore, documentation emphasis ensures that the postdeployment support staff has access to codified and detailed knowledge of products and their interfaces with other systems in a customer firm. This knowledge enhances the postdeployment support staff's understanding of the effects of changes in a product on (1) other products deployed in the customer firm and (2) other systems or processes in the customer firm. In turn, this enables a supplier to provide better postdeployment support. In the words of a customer,

> They make sure that their sales and marketing guys know what's going on. The sales and technical folks know what's going on, and the technical and support guys know what's going on with me. All these guys are in the loop, and it's not a puzzle for them.

Thus:

> P_2: The greater the documentation emphasis in a supplier, the greater is the solution effectiveness.

Incentive externality. Incentive externality refers to the degree to which employee incentives across units and functions in a supplier firm complement each other. Several customers and suppliers noted the adverse effects of incentive systems that lack such complementarities. Their observations mirror prior research on the importance of aligning incentives across subgroups to attain overall organizational objectives (e.g., Westphal and Zajac 1998). For example, sales personnel typically are paid a commission when they close a deal. Thus, they have a disincentive to assess a customer's unrecognized and future needs thoroughly if doing so will delay closing a deal. Similarly, they have little incentive to consider the feasibility of development, deployment, and postdeployment support. As the vice president of business planning at a customer noted,

> The marketing and sales people tell you anything to sign on the dotted line. These guys then move on to the next best deal. Well, now you have to deal with technical people who are not willing to change their core product.

This situation is less likely to arise if the incentives of the sales, development, operations, and support staff complement one another. For example, if the compensation of sales also depends on customer satisfaction with products, their deployment, and their postdeployment support, sales is unlikely to negotiate a deal without considering the feasibility of deployment and postdeployment support. In turn, this is likely to lead to more effective development and deployment of products, as well as better postdeployment support.

Incentive externality also encourages functions to share critical information with each other. For example, it encourages sales, development, and operations to share information with customer support about a solution's components, its users, and its interdependencies with other customer systems. In turn, customer support personnel can use this information to do a better job of supporting a customer by changing, upgrading, or replacing products. Frequently, however, critical information is not shared across functions. Consider the experience of a customer:

> The salespeople get paid when the solution is sold, and not three or four months after the solution is sold. They don't get paid even for the performance of the solution. They had two groups: one for getting us in and the other for actually getting things done. There were times when the support guys didn't even know what the others had said or were doing. We had to act as their messenger. Quite a reward for agreeing to pay a fat fee.

Incentive externality reflects a coordination of units' (or divisions') performance objectives and subsequent rewards, which promotes collaboration among them. As a solutions planning manager noted,

> If you have different divisions operating on different business models, they will have different and sometimes conflicting objectives. These competing objectives could, in turn, be a problem in trying to become a solutions provider as they will hinder the ability of these divisions to cooperate with each other.

When incentive externality across units is high, units are more likely to share their product designs and adapt to the changes in one another's products, thus facilitating their integration. In addition, a unit is more likely to modify its products for a customer if it is confident that other units will modify their products in response to its modifications. This is important because if one unit adapts its products to meet a customer's requirements, it may require other units to redesign their products to ensure interoperability of all products in the solution. Similarly, units with complementary incentives are more likely to cooperate with one another during deployment to carry out any unanticipated modifications needed in one or more products constituting a solution. Thus:

> P_3: The greater the incentive externality in a supplier, the greater is the solution effectiveness.

Customer interactor stability. Customer interactor stability refers to the duration for which customer interactors (e.g., sales personnel, support staff) are assigned to a customer. Greater stability leads to interactors developing stronger relationships or "social capital" with customer personnel. It has been argued that social capital helps interactors obtain important information, obtain it quickly, and develop shared points of view (Burt 1992; Granovetter 1973; Gulati 1995; Tsai and Ghosal 1998). In our context, it is likely to help interactors better understand a customer's industry, operations, employees, departments, and (potentially conflicting) requirements and thus identify the customer's recognized, unrecognized, and future needs (Kalwani and Narayandas 1995). As a customer argued,

> Don't change them every three months. It doesn't make sense to do that. How will they know us and understand us well enough in such a short time to be able to answer our problems and provide solutions?

Deep knowledge of a customer engendered by customer interactor stability enhances a supplier's ability to customize products to meet the customer's specific requirements. Furthermore, customer interactors who spend more time with a customer are more likely to form strong interpersonal relationships with customer employees. These relationships help a supplier overcome unanticipated problems that often arise during product deployment (see also Welch 2005). Consider the experience of the managing director for sales at a customer firm:

> Their contact team was very stable. We were able to build relationships with these guys, trust them, maintain a certain connection, and jointly overcome unexpected problems. This built a lot of goodwill among us. We were able to have candid conversations about things on each other's back end and understand each other's position when things were not going well.

Finally, customer interactor stability is vital for providing effective support to a customer. A stable support staff is likely to have greater knowledge of the products deployed for a customer, changes made to the products, and their implications for the customer. Thus:

> P_4: The greater the customer interactor stability in a supplier, the greater is the solution effectiveness.

Process articulation. Process articulation refers to the extent to which a supplier firm clearly states and makes available to its employees the processes for developing a solution. This includes the clarification of roles and responsibilities of units and functions, rules for specifying reporting structures, transfer pricing between units, sharing of customer information, and mechanisms for conflict resolution between units and functions involved in developing a solution. It is similar to the concept of formalization (e.g., Hage and Aiken 1969; Menon et al. 1999), but it is focused on solution development processes. Importantly, process articulation does not imply that rigid prescriptions for the specific solution's units and functions must develop; rather, it lays out a framework for the units and functions to interact with each other and a customer. As one participant put it, the essence of process articulation is on a supplier "defining the rule book, but not prescribing the playbook" for units and functions. In the words of the vice president for communications at a supplier,

> It is pertinent to tell them what they have to do, as coordination of multiple tasks is a must for solutions, but at the same time, it is counterproductive if you start prescribing how to do their jobs, because it inhibits flexibility, which is a must in designing solutions.

Clarification of roles and responsibilities helps ensure that customer requirements are defined accurately and are not glossed over because of confusion among units and functions about who is responsible for defining requirements (also see Meuter et al. 2005). Moreover, clear guidelines asking units to share customer and product information enable them to modify their respective products to ensure that they are integrated with each other. Similarly, clear guidelines that focus on customers encourage units to customize their products to meet customers' business needs. Furthermore, clarification of units' and functions' responsibilities toward customers helps avoid obstacles in deployment that often arise because of confusion among units and functions about their responsibilities. As a systems analyst at a supplier noted,

> It's important to know who is responsible for what in developing solutions. This is essential as there are different components involved, and dividing roles is useful as it avoids confusion and blame games between different departments and divisions. It's like a team, where each one knows what's required of them, and at the same time, they know how to fit into the big picture.

Finally, process articulation can be strongly instrumental in providing customer support because it helps avoid confusion about who is responsible for responding to a customer's request and how the various units are to contribute to this effort. Thus:

> P_5: The greater the process articulation in a supplier, the greater is the solution effectiveness.

Customer Variables

Data collected from customers strongly suggest that a solution's effectiveness depends not just on supplier variables but also on customer variables. The following customer variables surfaced in the field research as important predictors of solution effectiveness: (1) customer adaptiveness, (2) political counseling, and (3) operational counseling.

Customer adaptiveness. Several customers emphasized their need to adapt their internal routines and processes to suppliers' goods and services. As a controller at a health care firm noted,

> You should be willing to look at your business process, be willing to adapt to the solution sometimes, and just not expect the solution to adapt according to every element of your business. It needs to be flexible, and you also need to be flexible.

Customer adaptiveness refers to the extent to which a customer is willing to modify its routines and processes to accommodate a supplier's products. It is similar to the norm of relational flexibility, or the willingness of partners to adjust to each other as circumstances change (Heide and John 1992; Noordewier, John, and Nevin 1990). A customer's openness to making adjustments is likely to encourage "what-if" dialogues with a supplier in which the customer explores the different products the supplier could develop and the ways the customer could modify its internal routines to be able to use the supplier's existing products with relatively minor modifications. Generating and evaluating various options helps a supplier more accurately identify customer requirements and the actions needed to fulfill them (see Jaworski and Kohli 2006).

Several customers noted that customer adaptiveness influences the effectiveness of customization and the integration of products (see Table 2). If a customer is unwilling

to adapt, the number of modifications required in supplier products is greater, which makes it more difficult to customize and integrate them. Conversely, if a customer is willing to adapt, fewer product modifications will be required, and this facilitates product customization and integration. In the words of a customer,

> The customer also has to be willing to change their way of doing business. You have to trust the vendor in the sense that they are driving best practices, and following these practices could be beneficial for us. Modified software is not always the best answer to problems, especially if you are not going to change how you do your business.

In addition, a supplier can do a more effective job of deploying its products when a customer is willing to adjust to and accommodate both the supplier's needs and unforeseen contingencies as they arise. As the general manager of an automobile distributor noted,

> As a customer, we need to understand that there is a natural pain in implementation. On our part, we should be willing to make sacrifices. If it means working on Saturdays, then so be it. If it means that we need to make double data inputs, then so be it. Our management needs to be ready for the bumps ahead.

A supplier can provide more effective postdeployment support when a customer is willing to adjust to and accommodate a supplier's maintenance schedule or proposals to add new products. To paraphrase a customer's experience,

> The e-payment solution for us initially was based on off-the-shelf software. The software worked well with few users who had uniform requirements. As the number of users and their requirements multiplied, the software was unable to meet our needs, but our employees were apprehensive and unwilling to undergo extensive training to learn a new software application. The supplier was unable to install the new application in a timely manner because of this unwillingness on the part of our employees.

Thus:

> P_6: The greater the customer adaptiveness, the greater is the solution effectiveness.

Political counseling. Several customers noted that it is important for them to alert suppliers to political issues in their (customer) organizations (see Table 2). In addition, they noted the need to help suppliers actively navigate around such political land mines. As the chief information officer at a health care customer noted,

> The customer needs to understand their own political landscape and help set a path for the vendor to navigate it. The vendor, on their part, needs to participate in the navigation of this landscape, but they need to be very conscious of when to use the white-gloves, handle-with-care approach and when to use the throttle-ahead approach.

Political counseling refers to the extent to which a customer provides a supplier with information and guidance regarding the political landscape in the customer organization. It is a manifestation of one form of the information exchange norm discussed in the marketing and the social capital literature streams (e.g., Cannon and Perreault 1999; Nahapiet and Ghosal 1998). Political counseling helps a supplier better understand the priorities of the various stakeholders in a customer firm. This enables the supplier to define the customer's requirements in a more complete and nuanced manner. In addition, knowledge of a customer's political landscape is useful for customizing and integrating products to address the sensitivities of various stakeholders. As a customer noted,

> It's too much to expect the vendor to do everything. It's too tedious, there is way too much to learn about the internal politics, and it will take them way too long anyway. Worse, it might be risky, lest they tread on some tender toes.

Political counseling can be particularly critical during the deployment of products. To paraphrase the experience of a customer,

> The supplier was counseled that many unionized customer employees were afraid of being laid off if a new system was deployed. In response, the supplier customized the user interface to resemble the existing system and integrated it with the old terminals used by employees. The familiarity of the user interface's look and feel and its integration with existing user terminals conveyed a sense of continuity to the employees and soothed their fears of possible layoffs due to the adoption of a new system. The new system was readily adopted by the employees.

Similarly, political counseling enables a supplier to ensure that its postdeployment support is effective in addressing the political sensitivities of a customer's stakeholders. For example, political counseling led the supplier of a procurement solution (see Table 4) to establish a dedicated support hotline for unionized and government-supported planters—important stakeholders whose satisfaction with the solution was critical. In contrast, the lack of political counseling can lead to supplier blunders. As a customer recounted,

> Our [chief technology officer] led a team that had an important role to play in defining the requirements, but once the solution was implemented, the user groups became the dominant interface with the supplier. The supplier never understood that. They still had their salespeople on and kept going back to the [chief technology officer], who they thought was their champion.

Thus:

> P_7: The greater the customer's political counseling, the greater is the solution effectiveness.

Operational counseling. Operational counseling refers to the extent to which a customer provides information and guidance about its operations to a suppler. As with political counseling, it is a manifestation of one form of the information exchange norm that scholars such as Heide and John (1992) and Jap and Ganesan (2000) discuss. Operations information refers to information about the technical systems, business processes, and company policies in a customer firm. Several customers noted the role of operational counseling for developing effective solutions. As the chief information officer of a customer firm suggested,

> Give the supplier unfettered access to your operations. Let them see what's going on inside your processes. Tell them what you want, how you will measure their performance.

> In short, train them in your business, so that they know what the solution is supposed to do.

Operational counseling accelerates a supplier's learning about the unique elements of a customer's operating environment. This enables the supplier to define the customer's requirements more completely and accurately. Consider the experience of the director of acquisitions at a customer with a supplier:

> They had a fairly decent proposal that made a lot of sense, but it contained a couple of elements that did not just jell with who we are. We explained to them that this is not how we do business. We did it early up—explained to them how our operations work and how we would like this solution to work for us within our infrastructure. Looking back, I am glad we did this upfront. It made things clear for them and us and avoided misunderstandings later on.

Similarly, operational counseling provides a supplier with the knowledge needed for customizing and integrating products to suit the customer's operating environment. It may be particularly critical during the deployment stage because of the potentially unique aspects of a customer's operations. For example, a customer in the manufacturing sector noted,

> Reaching targeted levels of utilization within certain specified periods was an important policy objective in our firm. Fortunately, the supplier firm understood our operational needs well and built into guidelines for their deployment personnel [a process] akin to 5000-mile, 15,000-mile, and 50,000-mile checkups for cars.

Finally, operational counseling keeps a supplier abreast of the changes in the customer's operations landscape. This enables the supplier to anticipate the changes that will be required in its existing products and to identify new products that may be needed, thus providing the customer with effective postdeployment support. Thus:

> P_8: The greater the customer's operational counseling, the greater is the solution effectiveness.

Managerial Implications

This research suggests that it is useful to view a customer solution as a set of four relational processes. This perspective is in marked contrast to the extant product-centric view of a solution as a customized and integrated set of goods and services. The relational process view is consistent with the perspectives of customers we interviewed for this study and with the service-dominant logic advocated in recent years (see Rust 2004, 2006; Vargo and Lusch 2004). It also has significant implications for marketing practice.

First, it draws suppliers' attention to three processes in addition to customization and integration that customers consider critical—requirements definition, deployment, and postdeployment support. The field research suggests that suppliers either ignore these processes or pay inadequate attention to them (see Table 2). As such, suppliers may be able to create and deliver greater value to customers by focusing on these three processes in addition to customization and integration. Suppliers may also be able to increase customers' willingness to pay higher prices by better communicating to them the value they derive from each of the four relational processes constituting a solution. This is pertinent given that most suppliers appear to fail to realize adequate prices for their solutions (Roegener, Seifert, and Swinford 2001).

Second, delineating the four relational processes that constitute a solution brings into sharp focus organizational issues involved in developing and delivering solutions and highlights the importance of developing mechanisms for coordinating the different functions and units that perform the four relational processes. For example, the sales or business development functions typically perform requirements definition, whereas the customer support function performs postdeployment support. As we discussed previously, it is important for these functions to be "on the same page" for each of the four processes if the supplier is to deliver an effective solution. Similarly, it is important for a supplier to coordinate its various business units engaged in the four relational processes. Suppliers may want to consider initiatives discussed in this research, such as documentation emphasis, incentive externality, and process articulation, to enhance functional and unit coordination.

Third, the relational process view highlights the importance of executing each process while keeping in mind its effects on the subsequent processes. For example, if the requirements definition process is executed poorly or without input from the functions/units that will be involved in deploying or supporting products, the resulting overall solution is likely to be less effective.

Fourth, the relational process perspective on solutions facilitates more complete assessments of the costs of providing solutions. The poor profits earned to date by solution suppliers are likely due to their narrow view of solutions as integrated and customized product bundles. Such a view likely leads suppliers to ignore or underemphasize the additional costs of defining requirements, deploying products, and providing postdeployment support (see Stanley and Wojcik 2005). The relational process perspective also brings to the fore the high costs of coordinating the various functions and units engaged in the four processes. These coordination costs are not as visible as tangible costs, such as raw materials and direct labor, and thus may be underestimated by suppliers. However, it is critical that suppliers factor in the cost of coordination when pricing solutions to customers.

Fifth, viewing a solution as four relational processes has the potential to help suppliers develop a more structured and effective way for approaching customer engagements. In particular, it can help suppliers educate their employees to (1) expect a customer engagement to span four distinct process stages, each with its own set of actors and issues; (2) recognize the effect of each stage on subsequent stages and act accordingly; and (3) view themselves as engaged in value-creating relationships with customers rather than as selling or providing product bundles.

Insofar as the antecedents of solution effectiveness are concerned, a major finding of this research is that solution effectiveness depends on supplier and customer behaviors. The study emphasizes the need for customers to be willing

to adapt to suppliers' products and to provide them with political and operational counseling to obtain effective solutions. Moreover, customers that interact closely with suppliers in this way are likely to appreciate the value delivered and the costs incurred by suppliers. Such customers are less likely to demand bundling discounts, a problem that solution providers frequently encounter (see Roegener, Seifert, and Swinford 2001). For these reasons, a supplier may want to avoid conducting business with a customer that is not adaptive or is unlikely to "educate" the supplier about its internal politics and operations. The solution that a supplier implements for such a customer is likely to be ineffective, which, among other things, is likely to hurt the supplier's reputation in the marketplace.

The study suggests that after a supplier commences to work with a customer, the supplier should develop and maintain strong relationships with multiple individuals in the customer firm to a point at which the supplier is comfortable asking for political and operational counseling. The supplier might also encourage the customer to consider adapting its internal routines and processes to the supplier's existing products when appropriate. Such an approach is likely to result in a more cost-effective solution.

A supplier might also consider using a customer's political and operational counseling to adjust its internal management system to deliver an effective solution. For example, political and operational counseling can help a supplier develop a better understanding of the benefits that are important to the customer's stakeholders and the metrics the customer uses to assess its performance. The supplier can use these benefits and metrics as bases for designing incentives for the functions and units involved in providing customer solutions. Such an approach is likely to align the incentives of the supplier's functions and units with a customer's key requirements, thus increasing the likelihood of developing an effective solution. Moreover, it can help the suppliers and customers identify acceptable alternative performance criteria if it becomes clear that the original criteria agreed on are unachievable (for related work on coproduction. see Bendapudi and Leone 2003).

Finally, the supplier variables we identified that affect solution effectiveness are largely under supplier firms' control. Still, it is important for managers to be aware of the challenges involved in adopting certain practices. For example, contingent hierarchy represents a departure from traditional ways of structuring organizations. As such, its adoption may require significant organizational changes that may be met with resistance from managers with vested interests in an existing structure. In such cases, one approach may be to pilot contingent hierarchy among a few units, develop and communicate success stories, and follow up with phased adoption in other units. Similarly, implementation of documentation emphasis requires managers to go beyond issuing dictates. They need to put into place a value system and incentives that encourage personnel involved in providing solutions to document their activities and that provide them with access to systems that enable documentation in a rich but concise manner.

Research Directions

This study focuses on theory construction rather than on theory testing. Much work remains to be done toward developing measures of solution effectiveness, defining supplier and customer variables, and empirically testing the theoretical propositions advanced in this research. In addition, several fertile avenues exist for further research on solutions. For example, it would be useful to examine factors that moderate the effects of supplier and customer variables on solution effectiveness. We discuss two such potential moderators next.

Single Versus Multiple Suppliers

A customer may choose to source a complete solution from a single supplier or from multiple suppliers (Stremersch et al. 2003). Thus, a supplier may provide the complete solution by itself, or it may collaborate with other suppliers to create the solution. For example, Oracle is the sole provider of a channel management solution, whereas Dell and Microsoft jointly offer the Microsoft Exchange solution. This difference in strategy raises the question whether supplier variables identified in this study are more valuable when a solution is implemented by a single supplier than when it is implemented by multiple suppliers. It could be argued that the effects of policies that are internally focused, such as contingent hierarchy and incentive externality, are weaker when the emphasis is on coordination among suppliers than when it is on coordination among units within a supplier. In contrast, customer interactor stability is likely to have a stronger effect when multiple suppliers provide a solution. This is because customer interactors from multiple suppliers need to develop relationships not only with a customer but also with other suppliers (to understand their respective strengths and weaknesses). These conjectures require further investigation.

Customer Expertise

Variance in customers' expertise presents an intriguing challenge for solution providers. Research suggests that novices' preferences for customized goods are usually ill-defined (e.g., Simonson 2005). As such, it is more beneficial for a novice customer to adapt its routines to take advantage of a supplier's expertise. Therefore, customer adaptiveness is likely to have a stronger effect on solution effectiveness for a novice customer than for an expert customer. Conversely, the quality of operational counseling that a novice provides, compared with that of an expert, is likely to be somewhat suspect. As such, the effect of operational counseling on solution effectiveness may be weaker for a novice customer. Again, it would be useful to investigate this and other such possibilities.

In addition to moderating effects, several other research issues require further study. For example, selling solutions is a complex exercise that involves the consideration of conflicting requirements of multiple stakeholders in a customer organization and sales cycles lasting up to two years (Dhar, Menon, and Maach 2004). Although research in sales management examines strategies such as adaptive selling (e.g., Spiro and Weitz 1990), it is not clear how multiple supplier

personnel should communicate with the several stakeholders in a customer firm and manage the uncertainty that accompanies a long sales cycle. It would be useful to study issues that arise in such long-cycle selling and to identify ways of addressing the same.

Discussions with suppliers indicate that firms use different branding strategies for solutions. For example, some vendors use their corporate brand as a solution brand (e.g., IBM e-Procurement Solution), and others use an ingredient branding approach (e.g., Dell in Microsoft Exchange Server). This raises questions about the relative effectiveness of the different branding strategies for solutions. On the one hand, using individual product brands may lead customers to perceive the solution as offering best-of-breed in all product categories. On the other hand, customers may perceive the solution provider as having little expertise and control over product performance and liability. It would be useful to investigate the effectiveness of these alternative branding strategies in further research.

Conclusion

In recent years, scholars have called for more research on the concept of customer solutions (e.g., Day 2004; Sawhney 2006). This study draws on field research with customers and suppliers to offer a relational process perspective on customer solutions and to identify supplier and customer variables that influence solution effectiveness. It elaborates on several issues of managerial importance and brings to the fore several research issues that still need scholarly investigation. We hope that this study provides an impetus for further research on this important topic.

Appendix

Questions for Suppliers

We asked each interviewee and focus group participant a set of five questions along the following lines:

1. When you think of solutions you offer, what attributes come to mind? How is a solution different from a bundle?
2. Can you think of different types of solutions? What differentiates these types of solutions from each another?
3. Why did your firm decide to offer solutions?
4. What are the challenges in developing solutions? What factors are critical for the successful development of solutions?
5. Looking back on unsuccessful efforts to develop solutions, in your view, what factors contributed to the failures?

Questions for Customers

We asked each interviewee a set of six questions along the following lines:

1. What is a solution according to you?
2. What are your expectations from a solution, and how do you evaluate a solution?
3. How do you evaluate alternative solution suppliers?
4. What are the current deficiencies in delivery of solutions, and what are some possible remedies?
5. Why do you think some solution providers are more successful than others?
6. What role does a customer play in the development of a solution?

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