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How to Profit From a Better ‘Virtual Customer Environment’

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practices to promote appropriate customer experiences. To understand the experiences, let's examine the roles they play in the VCE.

Customer Roles in Virtual Customer Environments

Virtual customer environments can be designed to support five different customer roles in innovation and value cocreation: product conceptualizer, product designer, product tester, product support specialist and product marketer.⁴ (See “The Types of Virtual Customer Environments.”)

Product Conceptualizer Companies can encourage customers to interact among themselves to generate and advance product improvement and new product ideas. For example, Ducati Motor Holding S.p.A., the Italian motorcycle company, has implemented a virtual space

called Tech Café where customers share design ideas (including detailed engineering drawings) for customizing and improving motorcycles; some of the suggestions have been incorporated into Ducati's next generation of products. Similar mechanisms have been employed by Hallmark Cards Inc. and other companies to get customers to conceptualize products and channel ideas into the product development pipeline.

Product Designer Customers can also be product designers and design their own versions of the “ideal” product using virtual prototyping tools and design tool kits provided in the VCE.⁵ For example, Bayerische Motoren Werke AG has operated its Customer Innovation Lab by giving customers online design tools to develop their own ideas (particularly related to telematics and driver-assistance systems). Similarly, both French automaker PSA Peugeot Citroën S.A. and D. Swarovski & Co., an Austrian producer of crystal, have employed such design tools to facilitate customer design efforts.

Product Tester The application of virtual product technologies has also been extended to engage the customer in product testing. For example, both Volvo and Audi AG have implemented virtual reality tools to involve customers in product concept testing.

Product Support Specialist Perhaps the most common role for customers is supporting other customers as product support specialists. This allows them to leverage their product-related knowledge and expertise to extend support to peers.⁶ Technology companies such as HP, Novell, Cisco and Microsoft have been at the forefront of this area. Further, industry organizations such as the San Carlos, California-based Consortium for Service Innovation have been pursuing projects focused on enhancing the customer's role in product support through the innovative application of knowledge-based tools and technologies in VCEs.⁷

Product Marketer Some companies have also leveraged the expertise of customers in product marketing activities carried out in VCEs. They are able to pass along information about new products and shape peer perceptions through dialogue and discussions. Further, VCEs provide an effective venue in which customers may learn about new products. Both Korea's Samsung Group and Japan's Suzuki Motor Corp., for example, have experimented with virtual product launch centers that employ interactive product simulation technologies and, in the process, engage customers in product marketing.⁸

Individually, each of the customer roles has a lot to offer to companies. However, some roles have more relevance to some companies than to others. In fact, most companies pursue VCE initiatives that are focused on a single role. For example, while Microsoft's Most Valuable Professional program concentrates pri-

About the Research

The research for this paper was conducted over approximately the past seven years through multiple studies. Initial conceptual work focused on understanding the key design elements of virtual customer environments and the different customer value cocreation roles they facilitate. Following this conceptual work, over the next two years or so, we conducted two sets of extensive interviews with customers. The first set was with customers who had participated in the VCEs of companies, including Microsoft, HP, IBM, Sony, Palm, Volvo and Bang & Olufsen. The interviews focused on understanding customers' motivations for participating in innovation and value creation and obtaining detailed descriptions of their interaction experiences in such forums. The second set focused on Microsoft's Most Valuable Professional program. We conducted in-depth interviews with a number of people who had been awarded the MVP title as well as with Microsoft managers associated with this program. We also conducted interviews with managers and officers in other organizations associated with VCE initiatives (for example, the executive director of the Consortium for Service Innovation).

We followed these interview-based studies with multiple empirical studies that involved analyzing survey-based data collected from more than 500 customers who had participated in VCEs. The research models examined in the empirical studies were developed by drawing on theories and concepts from different areas, including innovation management, computer-mediated communication, consumer psychology, brand communities and information technology management. These studies helped us to validate the four components of customer experience and to understand their effect on both innovation and customer relationship management. The findings from the empirical studies as well as the insights derived from our earlier interview-based studies provided the basis for this article.

The Types of Virtual Customer Environments

Virtual customer environments can be designed to support five different customer roles in innovation and value co-creation. Depending on the type of customer role, the nature of their interactions and their experience in the VCE would vary.

Primary Focus of the VCE: Customer Role

	As Product Conceptualizer	As Product Designer	As Product Tester	As Product Support Specialist	As Product Marketer
Nature of Customer Contributions	Suggestions and ideas for new products and/or for product improvement	Specification of new product design; inputs on product features and design trade-offs	Identification of product design flaws; input on product prototypes	Delivery of product support services to peer customers	Diffusion of new product information; shaping peer customers' purchase behavior
Dominant Nature of Customer Interactions	<ul style="list-style-type: none"> • Customer-Customer • Customer-Company 	<ul style="list-style-type: none"> • Customer-Tool • Customer-Company 	<ul style="list-style-type: none"> • Customer-Tool • Customer-Company 	<ul style="list-style-type: none"> • Customer-Customer • Customer-Customer 	<ul style="list-style-type: none"> • Customer-Customer • Customer-Tool
Typical VCE Technologies	<ul style="list-style-type: none"> • Discussion forums • Knowledge centers • Blogs, wikis 	<ul style="list-style-type: none"> • Virtual product design and prototyping tools • Messaging tools 	<ul style="list-style-type: none"> • Virtual product simulation tools • Messaging tools 	<ul style="list-style-type: none"> • Discussion forums • Knowledge centers 	<ul style="list-style-type: none"> • Discussion forums • Virtual product simulation tools
Typical Example	Ducati's Tech Café	BMW's Customer Innovation Lab	Volvo's Concept Lab	Microsoft's MVP Program	Samsung's Virtual Product Launch Center
Dominant Customer Experience Components	<ul style="list-style-type: none"> • Pragmatic • Hedonic 	<ul style="list-style-type: none"> • Pragmatic • Usability • Hedonic 	<ul style="list-style-type: none"> • Pragmatic • Usability 	<ul style="list-style-type: none"> • Pragmatic • Sociability 	<ul style="list-style-type: none"> • Pragmatic • Sociability

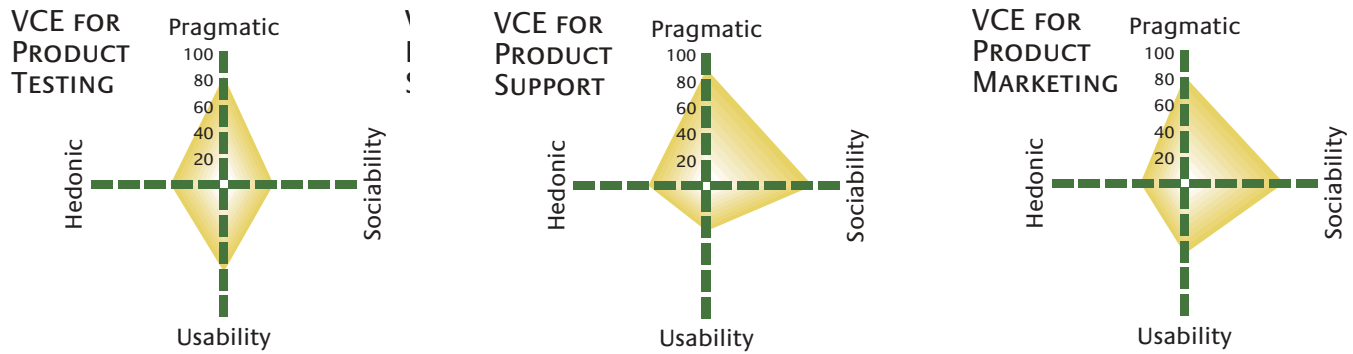
mainly on product support activities, Ducati's Tech Café focuses mainly on developing product concepts. Depending on the customer innovation role, the nature of the customer interactions and the technologies used in the VCE will vary — and thus the nature of customers' experience in the virtual environment will vary as well. However, before we relate the customer role to the experience, we need to define customers' VCE experience.

The Customer Experience The customer experience in a VCE is made up of four components: pragmatic experience, sociability experience, usability experience and hedonic experience.⁹ These components reflect three underlying contextual characteristics: Customer interactions involve product-related knowledge; they occur in a social or community context; and they are facilitated or mediated by different types of information technologies.¹⁰

Pragmatic Experience Most customers who visit or participate in VCEs do so to acquire information about a product, its underlying

technologies or its usage. The pragmatic component relates to customers' experience in realizing such product-related informational goals in the VCE (for example, their perception of the quality of information acquisition processes). Note that there are multiple ways for customers to achieve such goals — interacting with peer customers and company representatives, searching product knowledge centers or experimenting with product prototyping tools — and depending on their approach, their pragmatic experiences would vary.

Sociability Experience Interactions in a VCE often enable customers to perceive themselves as members of a group or community, and the underlying social and relational aspects of such interactions form the sociability experience of the customer. Thus, the sociability component emphasizes the importance of community dialogue and the social policies (or rules of engagement) that frame such dialogue. The promotion of a shared social or community identity in VCEs has been shown to contribute to positive



decide which customer experience profile is most appropriate. A clear understanding of this — specifically, the relative importance of the different experience components — will help companies tailor their VCE strategies and practices. However, first we will consider the impact of customer experience.

The Effect of Customers’ VCE Experience The customer interaction experience has two types of effects. (See “Antecedents and Consequences of Customer Experiences in VCEs,” p. 58.) The first relates to the immediate context of the experience and is succinctly captured in this comment by a customer: “I have been a visitor [to the VCE] for the last two years or so and I have generally enjoyed coming here and using my expertise to help others. ... As long as it is enjoyable, I plan to continue doing this.”¹⁵ Indeed, our studies indicate that customers who express positive experiences are twice as likely to remain involved and increase both the intensity and the quality of their contributions in the VCE.

The second effect has a much broader scope, relating to relationships customers have with both the product and the company. We found that most customers attribute their VCE experience (good or bad) directly to the company connected with that initiative. Indeed, it shapes their perceptions about both the company and the product. Interestingly, we also found that customers’ experiences had a greater effect on their views toward the company than it did on their future participation in innovation activities in the VCE. The effect of the customer experience also shaped purchase intentions and decisions. For example, one customer noted that the primary reason he decided to buy Palm Inc.’s Treo 650 smart phone over another product “was the active customer forum associated with it and the good experience I had while I visited them during my initial exploration.”

In general, we found that positive (negative) customer experiences led to positive (negative) outcomes with regard to both innovation (intensity of customer value cocreation) and cus-

tomers’ relationships. However, more significantly, we found that the difference between customer expectations and the actual experience on the four components was what really mattered. Further, there were threshold levels for each of the components beyond which a more positive experience did not necessarily translate into more positive outcomes. For example, if customers considered something especially important (for instance, sociability), a slight dip in that component had a magnified effect on customer attitudes. However, if something was considered relatively minor (say, usability), even a highly positive rating did not translate into a more favorable view of the product or company.

Thus, the goal is not to maximize all four components of the customers’ VCE experience — this may be too costly and may not even be effective. Instead, it is to create positive experiences beyond what is expected, particularly in those areas that are important within the given customer innovation context.

Strategies and Practices to Enhance the Customer Experience Based on our research, we developed four sets of strategies and practices that companies can adopt to enhance customer experiences in VCEs. Different companies will choose different approaches depending on their circumstances and what they are trying to accomplish. (See “Mapping VCE Strategies to Customer Profiles,” p. 59.)

Design to Encourage Customer Innovation Companies can create richer innovating environments by incorporating key design features into their VCEs. We identified several features that can improve customer experiences, including content rating systems, product knowledge centers, social translucence, customer recognition programs, exclusive customer forums, clean technical designs and flow technologies.

Rating systems. Having enough product-related content in the VCE is important not only to advance customer innovation

suggestions the company has received from customers worldwide, many of which have found their way into the product development pipeline.²⁰

Link the external to the internal Companies that want to benefit from their customers’ creativity need to adopt strategies that link their external customer innovating environments with internal product development teams.

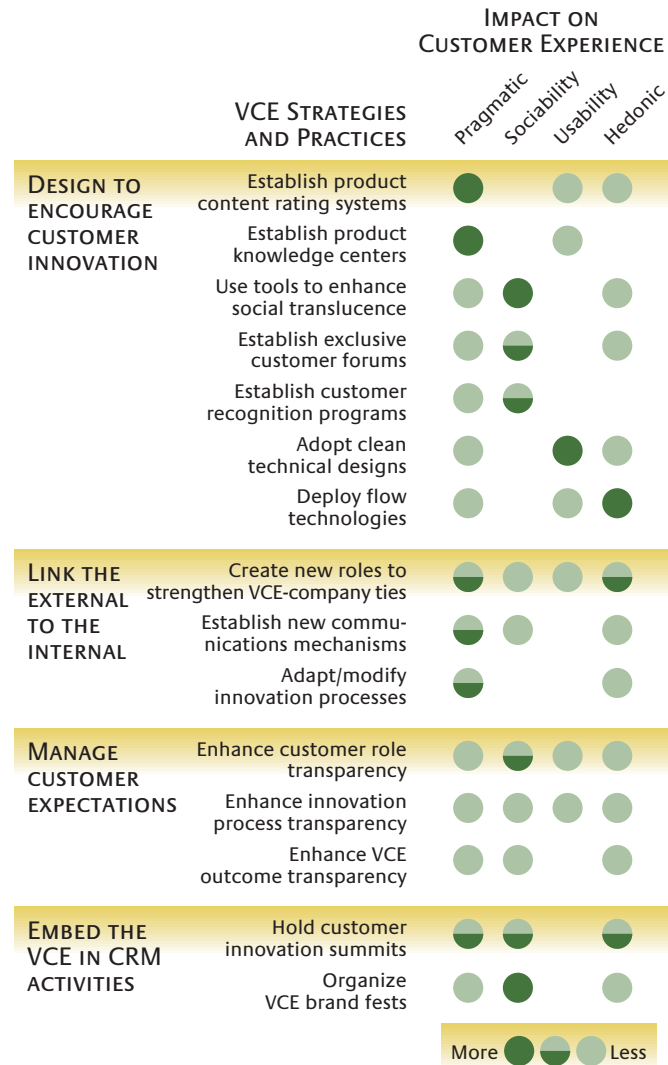
One way to achieve this is to establish new organizational roles to connect the virtual customer environment with internal product teams. For example, Microsoft has specially designated employees called “buddies” who play such a bridging role. Buddies interact directly with customer contributors in the VCE and ensure that their inputs are fed to the appropriate people within the organization. This also allows the company to participate in the conversations that occur in the external innovation forums and contribute to the customers’ hedonic experience. Our research shows that customers place a high value on their interactions with their buddy. As one Microsoft customer told us, “[my] interactions with the buddy have been extremely satisfying — they are very knowledgeable and I have really enjoyed trading ideas with them.”

Another way to connect the VCE with internal product teams is to create new communication mechanisms. Some of the companies we studied have used formal communication methods such as white papers to provide vision and direction to customers’ innovation and value cocreation activities. However, informal mechanisms can be equally important. For example, Germany’s SAP Aktiengesellschaft holds “ask the expert” discussions in its VCE that bring together company insiders and customers to discuss a wide range of product and technology issues. Companies have also started using blogs and wikis to facilitate informal conversations between internal experts and customers. A good example is Microsoft’s Channel 9 — an online forum that incorporates technologies such as blogs, podcasts, vodcasts and wikis to promote open conversations between customers and Microsoft employees.²¹

A third way for companies to integrate their VCE initiative into their overall innovation strategy is to adapt or modify their product development processes. This might include instituting new processes to respond to customer ideas and suggestions, to select appropriate innovation projects for the VCE, and to manage intellectual property rights. It could also include managing the risks associated with the VCE initiative and revamping the

Mapping VCE Strategies to Customer Profiles

Companies can adopt four sets of virtual customer environment strategies and practices with different levels of impact on the four components of customer experience. Different companies will choose different portfolios of these strategies and practices depending on their circumstances and what they are trying to accomplish in the VCE.



culture of product development teams to include customers as partners in innovation. As one manager who had led his company’s VCE initiative told us, “We had not given much thought to these [processes] early on ... however, some of these issues eventually took on a life of their own, and as we discovered they were issues not only for us but for our customers as well.” Indeed, we found that instituting appropriate processes to accommodate the VCE activities and their outcomes can go a long way toward enhancing the customer experience and ensuring returns to the company.

27, no. 3 (2002): 392-413. Other recent publications that have described such virtual customer forums for innovation include: C.K. Prahalad and V. Ramaswamy, "The Future of Competition: Co-creating Unique Value With Customers" (Boston: HBS Press, 2003); M. Sawhney, G. Verona and E. Prandelli, "Collaborating to Create: The Internet As a Platform for Customer Engagement in Product Innovation," *Journal of Interactive Marketing* 19, no. 4 (autumn 2005): 4-17; S. Nambisan and R. Baron, "Interactions in Virtual Customer Environments: Implications for Product Support and Customer Relationship Management," *Journal of Interactive Marketing* 21, no. 2 (spring 2007): 42-62.

2. Author's interview with Microsoft MVP program managers in 2004.

3. For example, in 1999, Microsoft made some radical changes in its VCE initiative, the MVP program. To its surprise, the company soon discovered that the initiative had implications well beyond the product support activities it was originally meant for — implications on customer relationship management that the company had not previously taken into consideration. Microsoft had to reverse some of those decisions. For more details, see A. Leonard, "Microsoft Flip-Flop," *Salon Technology*, Oct. 26, 1999.

4. See Nambisan, "Designing Virtual Customer Environments." Other studies have also considered customer roles in value cocreation. For example, see C.A. Lengnick-Hall, "Customer Contributions to Quality: A Different View of the Customer-Oriented Firm," *Academy of Management Review* 21, no. 3 (July 1996): 791-824; and N. Bendapudi and R.P. Leone, "Psychological Implications of Customer Participation in Co-Production," *Journal of Marketing* 67, no. 1 (January 2003): 14-28.

5. For more on such virtual design methods and tools, see E. Dahan and J.R. Hauser, "The Virtual Customer," *Journal of Product Innovation Management* 19, no. 5 (September 2002): 332-353; E. von Hippel, "User Tool Kits for Innovation," *Journal of Product Innovation Management* 18, no. 4 (July 2001): 247-257; and G.L. Urban and J.R. Hauser's discussion of virtual engineer and design palettes in "Listening in to Find and Explore New Combinations of Customer Needs," *Journal of Marketing* 68, no. 2 (April 2004): 72-87.

6. Many traditional offline product user groups — such as Harley Owners Group, Apple User Group and Saab Owners Group — have hosted such peer-to-peer product support activities, although they have largely been localized activities and mostly outside the purview of the vendor. For a discussion of such offline customer communities, see A.M. Muniz, Jr., and T.C. O'Guinn, "Brand Community," *Journal of Consumer Research* 27, no. 4 (March 2001): 412-432.

7. The Consortium for Service Innovation is a nonprofit alliance of companies focused on innovation for the customer support industry. Members include leading companies such as Cisco, HP, Microsoft, Texas Instruments, Hilton Hotels, Fujitsu and JPMorgan Chase. Details are available at www.serviceinnovation.org.

8. Studies have found that visual and functional control of virtual product tools enhances customers' perceived diagnosticity (that is, ability to evaluate a product) and leads to favorable product purchase-related attitudes and intentions. For example, see Z. Jiang and I. Benbasat, "Virtual Product Experience: Effects of Visual and Functional Control of Products on Perceived Diagnosticity and Flow in Electronic Shopping," *Journal of Management Information Systems* 21, no. 3 (winter 2005): 111-148.

9. See P. Nambisan, "Online Community Experience: Impact on Customer Attitudes" (Ph.D. diss., Rensselaer Polytechnic Institute, December 2005). Also see P. Nambisan, "Conceptualizing Customers' Online Community Experience (OCE): An Experimental Study," *International Journal of Internet Marketing and Advertising*, in press.

10. Given these different contextual characteristics, our framework of customers' VCE experience draws on diverse theoretical domains, in-

cluding innovation management, computer-mediated communication, consumer psychology, online communities and information technology.

11. Authors' interview with a customer participant in Bang & Olufsen's VCE in 2003.

12. See J. Nielsen, "Usability Engineering" (San Francisco: Morgan Kaufmann, 1993); and J. Nielsen, "Designing Web Usability: The Practice of Simplicity" (Indianapolis: New Riders Publishing, 1999).

13. Authors' interview with a customer participant in Microsoft's VCE in 2004.

14. The second author developed a survey-based tool to measure the four components of a customer's experience in a VCE (see Nambisan, "Online Community Experience"). The tool, which incorporates a set of 22 items, was created partly based on prior research in consumer psychology as well as on a theoretical approach called "uses and gratifications" developed in the mass media communications area by Jay Blumler and Elihu Katz in the early 1970s to study how and why consumers use different types of media. We surveyed the customers in these four companies and then found the average (across all customer participants in a given VCE) for each of the four experience components.

15. Authors' interview with a customer participant in Microsoft's VCE in 2004.

16. For example, Microsoft's Netscan project helped customers track the activity of the different online customer discussion forums and the conversation threads that emerge from their activity. More details on Microsoft's Netscan project are available at: <http://netscan.research.microsoft.com>.

17. For more details on such semantic visualization tools, see J. Donath, "A Semantic Approach to Visualizing Conversation," *Communications of the ACM* 45, no. 4 (2002): 45-49.

18. For more details on IBM's tools (Loops, Babble), see T. Erickson et al., "Social Translucence: Designing Social Infrastructures That Make Collective Activity Visible," *Communications of the ACM* 45, no. 4 (April 2002): 40-44.

19. The concept of "flow," proposed by psychologist Mihaly Csikszentmihalyi, reflects a mental state of operation in which a person is fully immersed in what he/she is doing. Research conducted by Dona Hoffman and her colleagues in the 1990s has shown how compelling online environments may lead to such a state of flow or enhanced customer experiences. See, for example, Novak et al., "Measuring the Customer Experience in Online Environments: A Structural Modeling Approach," *Marketing Science* 19, no. 1 (2000): 22-42.

20. Two of the concept cars previously shown on Volvo's VCE have become production vehicles. The Adventure Concept Car became the award-winning XC90, and the Performance Concept Cars turned into the new S60 R and V70R.

21. Channel 9 facilitates an open dialogue between Microsoft customers and internal developers — a dialogue that is not mediated by internal marketing groups or any other Microsoft organizational unit. It features interviews with Microsoft developers about their products as well as a wiki that has been used by various Microsoft product development teams as a way to aggregate customer feedback and respond to it. For more details, visit: <http://Channel9.msdn.com>.

22. See B. Schneider and D.E. Bowen, "Understanding Customer Delight and Outrage," *Sloan Management Review* 41, no. 1 (fall 1999): 35-45.

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