

# Reinventing Customization:

NEW TECHNOLOGIES,  
NEW MARKETS, AND  
NEW STRATEGIES





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NEW TECHNOLOGIES, NEW MARKETS,  
AND NEW STRATEGIES

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## EXECUTIVE SUMMARY



In the future, customization will be ubiquitous—but it won't look the way we once thought. It will be reinvented. Three key drivers are changing the dynamics of the marketplace, creating the conditions for a fresh look at customization. These drivers are:

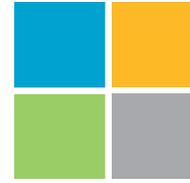
- Engaged consumers are demanding customizable products.
- Fragmenting markets are creating increasing diversity to customize around.
- New technologies are enabling different ways to capture and utilize customer data for customization.

To prepare for these shifts, companies will need to further customize their products and services. Traditional mass customization models have not worked well. Poorly implemented CRM applications, incompatible business models, and lack of enthusiastic response from consumers have foiled previous efforts. The new world of customization will require companies to work alongside the customers to help them customize their own products along the entire product cycle, and adopt new perspectives on the marketplace.

Building on the market lens framework described in the companion report, *Beyond Consumer Segmentation: New Technologies, New Market Lenses* (IFTF SR-807 A), this report, *Reinventing Customization: New Technologies, New Markets, and New Strategies* (IFTF SR-807 B), demonstrates how customization is likely to emerge in the future—not necessarily as personalized to specific individuals' desires, but to small groups based on product use, context, social networks, swarms, and other characteristics. The market lens framework depicts a range of different “lenses” that companies will use over the next ten years to understand their consumer markets. Some of these lenses will be similar to the ones companies use now—they may seek to segment their markets into large groups (the Segments Lens), track the preferences of individual customers (the Individual Lens), or understand customers' actual patterns of product or service use (the Experience Lens). Other lenses will emerge in tandem with new technologies, allowing companies to remotely sense the identity, location, or even mood of consumers (the Context Lens), understand how purchasing and usage are affected by consumers' networks of friends and family (the Social Networks Lens), or capitalize upon emergent patterns in the behavior of large crowds of consumers (the Swarms Lens). Here, we look at customization through these lenses, and consider the implications and strategies for companies who wish to move into this space. As a special epilogue, we look at customization challenges in developing markets.



# 1. INTRODUCTION: WHATEVER HAPPENED TO MASS CUSTOMIZATION?



The notion of customizing products has been around for centuries. Before mass production and mass markets, skilled artisans created products designed specifically for individual customers. More recently, companies operating in mass markets have been exploring the opportunities for mass-production of products and services that have some customized elements. In this chapter, we consider how different companies have defined mass customization and some of the problems and barriers that have prevented many mass customization initiatives from succeeding.

## HOW TO DEFINE CUSTOMIZATION?

Mass customization—and related terms such as built-to-order customization, or even one-to-one marketing—have many different interpretations (see text box, “Customization Defined”). From a business perspective, the common thread is the desire to *meet the needs of individual consumers while reaching and maintaining a large market without increasing costs*. From a consumer perspective, the common thread is the ability to *choose which features will be incorporated into desired products and services*.

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### CUSTOMIZATION DEFINED

#### ■ Mass customization

“Delivering goods and services, for a large market, which exactly meet the needs of every individual customer with regard to certain product characteristics at costs roughly corresponding to those of standard mass produced goods.”

—*Sloan Management Review*

#### ■ One-to-one marketing

“Identifying, tracking, and interacting with an individual customer, then reconfiguring your product or service to meet that customer’s needs.”

—*Peppers and Rogers*

#### ■ Build-to-order

“Goods and services are produced only after the order is placed, based on the customer’s wishes and needs.”

—*Institute for the Future*

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## 1. INTRODUCTION: WHATEVER HAPPENED TO MASS CUSTOMIZATION?

Companies may also draw their own distinctions among customized products, services, and marketing communications, to reflect company practices. For example, Colin Light at Hutchison3G, explained at the April 2003 Business Horizons conference, “Two years ago when we were building our systems from scratch, we drew the distinction between *customization and personalization*. ... We defined customization as something the customer would do to the product, while personalization was something we as a business would do to “talk” to that customer in a personal way. ... When you as a consumer decide to change the product set on your mobile phone to make sure football is at the bottom of the list and financial services is at the top of the list, we could (but we don’t at the moment), acknowledge that in real time and change the way we talk to you in real time, to reflect that.” In this case, aligning “personalization” and “customization” too closely may make customers feel their every action is being monitored.

### WHAT HAPPENED TO THE EARLY PROMISE OF MASS CUSTOMIZATION?

During the 1990s, many companies were intrigued by the prospect of customizing their goods and services to individuals’ needs and preferences. The interest quickly turned to disenchantment, however, as over-reliance on customer relationship management (CRM) applications, incompatible business models, and limited consumer interest all reduced the value of customization initiatives.

#### The Rise and Fall of CRM

In order for customization models to work, businesses need to know what consumers’ needs and preferences are. Many companies turned to CRM to integrate existing customer databases. (CRM software has now become an

umbrella acronym for all software applications that integrate customer service, sales force automation, customer analytics, or marketing.) The promise that CRM could provide higher levels of customer service and retention, cost savings, and revenue increases led to an 89% increase in CRM investments in 2000, with companies paying \$60 to \$130 million for large implementations. By 2001, CRM represented about 5% of software sales. Financial services, telecommunications, and retail companies became the largest users of these technologies. But by the end of 2001, CRM spending was already beginning to shrink.

Companies began to question the benefits that the technology provided. The Gartner Group found that 55% of companies surveyed considered their CRM projects a failure. An Accenture survey found that three quarters of marketing executives did not even know if there had been any return on their CRM or one-to-one marketing systems. Furthermore, 70% of them reported having trouble with their personalized marketing campaigns and another 60% of them reported having trouble using their data to develop a unified view of their consumer. Consumers also did not seem satisfied—customer satisfaction rates dropped at the same time that CRM investment rose.

There are several plausible explanations for CRM’s high failure rate. CRM initiatives were often over-ambitious, rushed, and implemented without corresponding changes to organizational structures and business processes. The customer data that CRM systems need were often difficult to locate and integrate. The initiatives were sometimes implemented without a clear customer relationship strategy. These barriers to success are not impossible to overcome, but they are also neither trivial nor cheap.

### Mass Customization Affects Mass Market Revenue Streams

Similarly, mass customization also threatened existing mass-market business models. Some businesses rely heavily on having “blockbuster” products, and wrestle with the impact of customization on their bottom line. For example, pharmaceutical companies could use genomics to predict which patients are likely to suffer adverse effects during clinical drug trials. Eliminating these patients would make those trials more successful, but the drug would then only be useful for a smaller market. As Bern Shen, IFTF Research Director, points out, “Fewer drugs will be killed in clinical trials but then the problem is you have a lower chance of having a big blockbuster drug. ... What is the best strategy to have the highest through-point [using] clinical trials, while at the same time not cut into your market?” It is difficult for incumbents to change business models that have previously made money.

Mass customization can come with “hidden” costs as well. For example, Gary Herman, Director of Emergent Systems at Hewlett-Packard, notes, “The owner of the brand inherits a responsibility—real or perceived—for supporting customization. Customized products can have such high intrinsic complexity that the combinatorics start to kill you from an economics point of view, because you cannot afford to test all the combinations and train people to diagnose [their problems]. ... Even if it is not your fault, your brand is what suffers when things don’t work right. So the downstream costs of customization are very significant in businesses that have that kind of intrinsic complexity.” This can be a particular problem when a large share of customer service happens outside the company, for example with the automobile industry.

### Customization Has Limited Appeal

Furthermore, consumers themselves have had mixed reactions to customized products. Many large companies have tried to offer customized products, from Levi’s jeans, to General Mill’s cereal, Reflect.com’s cosmetics, and Millstone’s coffee—some of which are no longer offered today. Many of these companies have had to back off from these products because they did not appeal to a large enough market.

#### *Customization Can Burden Consumers*

One problem is the burden that customization can place upon consumers. Consumers simply may not be interested in investing the time and energy needed to customize some products. Marina Gorbis, IFTF Research Director, asks, “It works beautifully for Dell, but the question is does it work for everybody? Consumers have to invest time to specify what they want—and consumers often don’t know what they want.”

As customization becomes more prevalent, customers may learn to take it in stride. For example, many work environments are becoming more customized, with moveable screens and tables. As workers become accustomed to the idea of interacting with items within their environments to get things done, some of them will become more comfortable with the notion of changing products in other parts of their lives. Deb Keen, Communications Manager at Herman Miller, explains, “trends in work are going to drive more user flexibility in other environments. For instance, when someone comes into a new room [he or she] would say, ‘I don’t like where this table is, so I’m going to move it.’” Some—but not all—consumers will gain enough experience to not feel burdened by the extra time investment.

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## 1. INTRODUCTION: WHATEVER HAPPENED TO MASS CUSTOMIZATION?

### *Consumers Want Customization in Some Products, Not Others*

A second problem is that consumers are simply more amenable to the customization of some products over others. As Philip Friedly, Senior Research Manager at Allstate, notes, “It’s the category and nature of the products. There are lower interest products and there are higher interest products where the consumers are more involved.” High-end and big-ticket offerings are natural high-interest products, and companies may need to focus their customization effort in these areas. Mark Evans, Associate Director at Procter & Gamble, notes, “Whether you are prestige, mass, or in a direct channel, [will make it] vary pretty dramatically. We have these really elaborate systems in our prestige counters in Japan where consumers can see how much sun damage they have on their face and see what color products they need. There is an incredible level of matching their needs to the right product offering. ... [On the other hand,] consumers really don’t want to have to adjust their hairspray just so it works right!”

### LESSONS FOR BUSINESS

Mass customization, in all forms, has varied levels of success for businesses. But the problems suggest three lessons for companies who would like to take another look at customization:

- *Just because you can customize something, doesn’t mean you should.* Each customized element of an offering sends a message to a consumer. Too little customization says, “I am not focused on your individualized needs”—but too much customization says, “I am stalking you!”
- *Customization processes can have an impact on mass-market revenue streams.* From R&D models to service and repair processes, customized products and services have unique needs that may not fit well with existing mass-market processes. Introducing customization may have unintended consequences on other business processes, both downstream and upstream.
- *Customization is not a suitable strategy for all products, nor is it for every consumer.* The task lies in identifying the best products to customize for the right markets. The key to this is to identify the consumers who are or would like to be the most engaged with your products.

## 2. CONSUMERS WHO TAKE CONTROL OF CUSTOMIZATION



Some consumers definitely want to take control of customization. They experiment with and personalize communications, products, and services to meet their needs. In short, they become engaged consumers. Such consumers often cross the traditional boundaries of segmentation, such as age, income, and educational status. Engaged consumers are characterized by their “take charge” behaviors. For example, they:

- Rely upon their personal networks of relationships, places, and resources to create idiosyncratic solutions to the problems of everyday life;
- Create modifications of existing technologies by using “work-arounds” and making innovative adaptations to add new capabilities; and
- Experiment with entertainment media whose characteristics encourage customization of content, context, and boundaries of reality.

These behaviors may happen “under the radar” of a traditional market research perspective, emerging in unforeseen areas—new intermediaries, conflicts over intellectual property, or unexpected consumer collectives. Companies therefore have to look more broadly to capture opportunities in their markets. We consider three ways in which consumers mass customize—personal ecologies, technology work-arounds, and customizing entertainment media—including examples of how these phenomena play out in several industries.

### PERSONAL ECOLOGIES

From a consumer’s perspective, most interactions with businesses take place within a larger universe of people, places, and companies. To help them navigate these interactions—and many other areas of life—consumers create “personal ecologies.” Personal ecologies reflect the pool of resources that an individual draws on to meet needs in any area of life such as shopping, parenting, health, and education. When a gap exists between the options that businesses provide and the needs of consumers, personal ecologies become more complex. This occurs as many different interactions with different businesses, often at different times in different places, are required to satisfy the consumer’s needs.

### Personal Health Ecologies

Consumers are facing increasing costs and responsibility for decisions affecting their health and health care. In addition, there are many choices in the marketplace that can contribute to their health: from bottled water, to health devices and genetically modified food. Rod Falcon, IFTF Research Director, explains, “For [some] consumers to pursue health, it doesn’t mean just going to the doctor for a routine check up. It means eating differently, eating organic foods, and exercising. It means burning candles, buying a particular scent to create a mood in your home, feeding your spirit in particular ways, whatever that may mean to the person.” The health care system does not typically address these offerings, nor the underlying consumer issues that generate the need for them—such as the consumer’s desire for better nutrition or increased fitness within their busy schedules.

Consumers are creating customized personal health infrastructures that are more responsive to their needs than the formal health care system. In fact, consumers are creating and managing entire ecosystems of resources, practices, and strategies to manage their health and the health of their families. These infrastructures—*personal health ecologies*—represent networks of resources (for example, people, institutions, information sources, experts, alternative providers, advocates, practices, strategies, beliefs, products, and services that consumers leverage to manage their health and make health decisions (see Figure 2–1).

### Personal Shopping Ecologies

Consumers develop personal ecologies to help them manage any part of their lives. The customized strategies used to create personal shopping ecologies vary from individual to individual, but reflect important decisions about trust relative to different providers, brands, or retailers. IFTF research on trust, conducted with frequent discount-store shoppers (for example, Wal-Mart and Dollar Store), revealed that even everyday grocery shopping could be a complex endeavor. A typical interviewee explained that in a given week, she bought her meats at Safeway, her produce at K-Mart and 99-cent stores, and other household items at Wal-Mart. She knew the layouts of each of the stores, the sale schedules, and was willing to invest the time to visit each store. In fact, she derived some enjoyment from shopping within her sophisticated shopping ecology.

This example reveals that companies are not the only ones doing segmentation. The most engaged consumers might also be segmenting—segmenting companies and their offerings. The consumer selectively assigns trust to different retailers and different brands. And when consumers place trust in a retailer, it can be for a very specific reason rather than the whole value proposition that the company is offering. In this case, the consumer fits retailers into different niches in the ecology. Figure 2–2, on page 8, shows one personal shopping ecology, with people, companies, places, and other online and offline resources that a consumer might negotiate to get his or her shopping needs met.

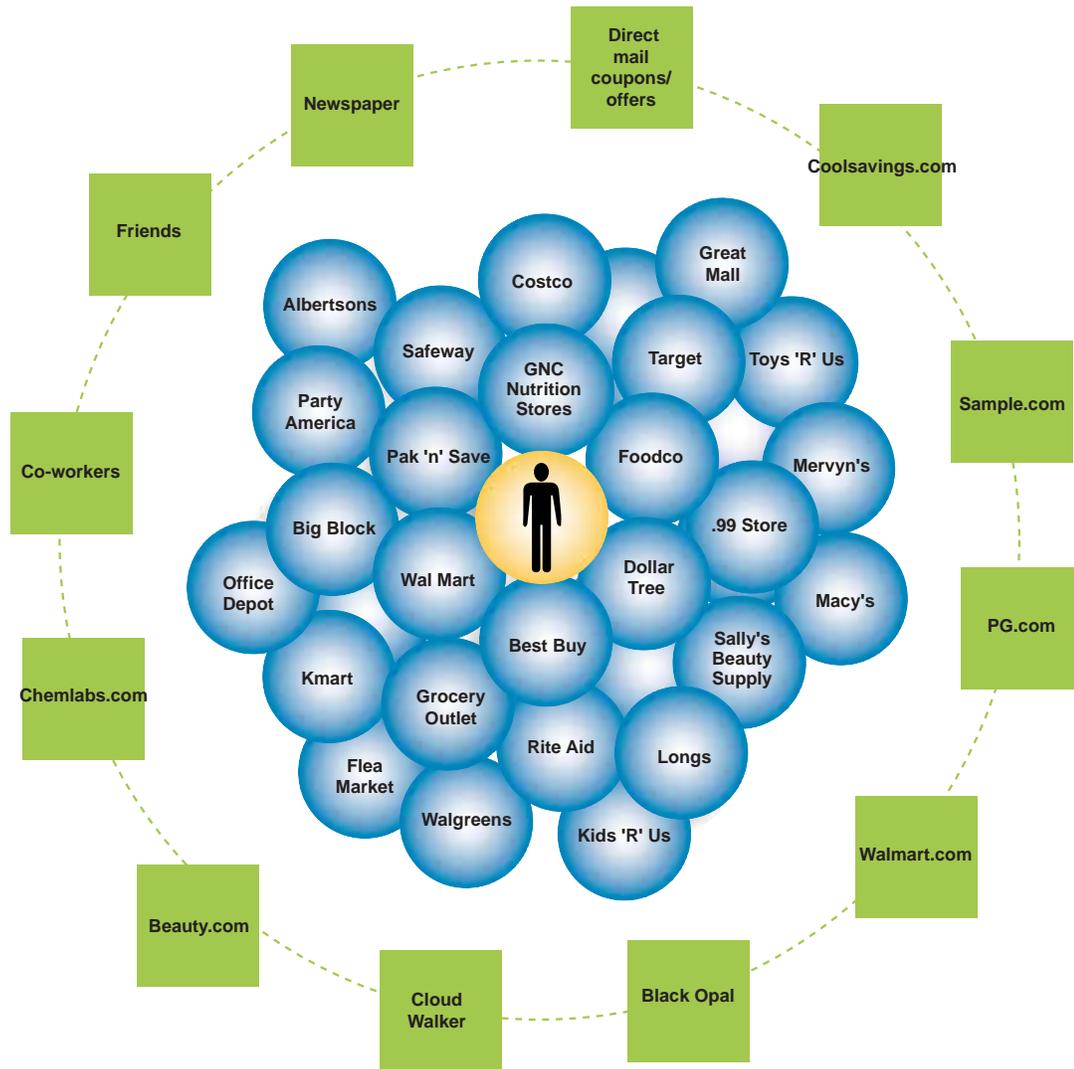
Figure 2-1  
A Personal Health Ecology



Source: Institute for the Future

## 2. CONSUMERS WHO TAKE CONTROL OF CUSTOMIZATION

Figure 2-2  
A Personal Shopping Ecology



Source: Institute for the Future

Already, technological connectivity has allowed consumers to pull geographically distant individuals, companies, and institutions into their personal ecologies. In the future, with even more connectivity, these ecologies will become more important. Mobile telephones, instant messaging, short text messaging, and other methods of mobile communication will allow people to tap into their ecologies at a moment's notice—bringing the power of these ecologies into a broader array of interactions with companies.

## CREATIVE CUSTOMIZATION OF TECHNOLOGY

Consumer electronics is another industry that fosters engagement. Frequently the technology itself is a clumsy fit to people's needs; Kathi Vian, Research Director at IFTF, explains, "Technology is basically a mechanical system and we are not mechanical beings, so there is an awkward interface." To adjust, the most engaged consumers develop strategies to get what they need—in other words, they develop work-arounds. (For more on work-arounds see, "Extreme Customization in the Automobile Industry.") These work-arounds

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### ■ EXTREME CUSTOMIZATION IN THE AUTOMOBILE INDUSTRY

Work-arounds aren't only relevant for electronics and software companies. The automobile industry is increasingly responding to fans of "extreme customization"—extensive after-market modification of an auto's appearance or performance. Studying the consumers who customize their cars helps automobile makers design interactive vehicles that will appeal to those consumers. For example, Honda's Element vehicle leverages Honda's understanding of how these consumers often modify Honda cars. Mark Ashcraft, Senior Futurist at Honda R&D, comments that the Element has "a lot of panels that can be easily removed and interchanged—unlike any other Honda. I am waiting for the after-market people to pick up on this and begin to customize these things. Some of what happens with that vehicle we will also see with other popular Honda models or Acura models." Honda is also taking its learnings from this market one step further, working on new software that would help customers design their own personalized vehicle in real-time. The software, to be made available in Honda dealerships, would relay the customer's design to the factories so the vehicle could be custom built. Honda's commercialization of extreme work-arounds is a good example of how learning from engaged consumers can move companies toward greater customization.

are forms of customization, and are very individualized ways to meet a person's needs through technology. This engaged consumer is also likely to develop clever adaptations of the technology to add new custom capabilities.

### **Hackers Customize, Companies Commercialize**

Work-arounds include hacking. For example, the recording capacity of the early TiVo personal video recorders was not large enough to suit early adopters' needs, so many of them immediately added additional hard drive space to expand capacity.

In fact, to best understand the role of consumers in customizing technology, one must understand the special class of consumers who are most engaged with technology—"nerds." Through their hacks, work-arounds, and other customizations, "nerds" end up not only customizing technology to their own needs, they often end up directly defining the direction that a given technology is going.

TiVo nerds, for example, started hacking their hardware to increase hard drive space well before TiVo itself responded by offering larger storage capacity. Similarly, Apple's iPod MP3 player was very popular with music aficionados. However, hackers soon figured out how to create an empty MP3 file to plug in their personal contact information. They essentially repurposed the iPod as a contact manager, while still keeping the interface and organizational style to manage their contacts. Low and behold, later versions of the iPod introduced a contact management capability. In these examples, the most engaged consumers are really the ones who define future iterations of the product, while the technology companies learn from those customizations and commercialize them.

### **RFID Tags and New Consumer Intermediaries**

Over the next decade, clever consumers will customize new technologies to new purposes. For example, RFID tags, used today by manufacturers and retailers to improve asset management and inventory tracking, may in the future be customizable by consumers. Instead of "turning off" the tags at the check-out counter, MIT is trying to determine how to allow consumers to program their own uses and functions into the RFID tags that are already in purchased products and packages. This would take the tags from being purely a logistical advantage for companies and make them something that will ultimately be valuable for the consumer. At the same time, it is unpredictable about which ways those uses are likely to go, when every product could have a tag in it in and virtually any consumer could be putting those tags to personal uses.

Consumer customization allows new intermediaries to emerge—intermediaries that can help consumers get the customized products they want. In the text box, "RFIDs Fight Back!" we see Google as an information intermediary. A great example of this in the health care industry is compounding pharmacies: pharmacies that produce medicine to meet an individual's drug needs. Instead of a "one-size-fits-all" pill that is manufactured by a pharmaceutical company, a compounding pharmacy prepares the right dosage for a particular person's needs. These companies began to emerge in the late 1980s to serve two consumer markets: asthma sufferers who needed special formulations of inhalants, and baby boomer women who needed hormone replacement therapy. Compounding pharmacies have been able to successfully resist legal pressure from pharmaceutical companies and federal pressure to perform large clinical trials, and have carved out a place as an intermediate between two engaged consumer markets and "big pharma."

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## ■ RFID BITES BACK!

At the Technology Horizon's Exchange in June, IFTF president Bob Johansen had this story to tell about where consumers might go with RFID tags:

"Last week, Howard Reingold, the man who wrote the book *Smart Mobs*, [was] at a meeting we were doing, and Howard told the story of being at Microsoft recently working with a friend there in R&D. He had a PDA-like device with a bar code scanner for UPC codes (this wasn't even RFID at that stage). And Howard said, 'That is interesting, but what do you do with it?' So they walked into a store and Howard picked up this box of prunes that had an innocuous looking name, "California Prune Cooperative," and he scanned the bar code. The PDA then logged him on through Google, did a Net search, and came back with a lawsuit pending against the prune company for adding chemicals to their prunes. Now this was probably not what the prune company had in mind for consumers to see! But it shows there will be much more information with RFID tags. ... Now, if consumers have an interest in lobbying against prunes, they can do that. So it really is a whole new medium for customization." While new technologies are allowing companies to learn more from their consumers, it goes the other way too—and will make consumers even more discretionary about their purchases.

—Bob Johansen, IFTF President

"I [wonder] who has the time to go in and swipe every product with a PDA and wait for Google to download any negative information about that product. This presents a business opportunity, which is the trusted intermediary. In fact, I would like my PDA to flag products that had something against them rather than forming a whole search on them.

—Rob Swigart, IFTF Research Affiliate and author

"Not trusted intermediary, but the trusted network and the trusted swarm. Collective problem solving affects how fast things happen. One online game recently had a first level challenge and the winner was going to get \$25,000. They estimated it would be a month before they would get there and a collective solved it in three days. Apply that to whatever kind of problem!"

—Andrea Saveri, IFTF Director

### CUSTOMIZING THE ENTERTAINMENT MEDIA

Although consumers may customize as a means to an end, they also can customize for the pure pleasure of the experience. In entertainment, customization is a valuable experience. In response, technologies and services are enabling environments for customization, giving consumers more control. There are three areas where consumers are very active in customizing entertainment (see Figure 2–3):

- Personalizing mass content and events;
- Personalizing the context of an entertainment experience; and
- Personalizing the boundaries of reality.

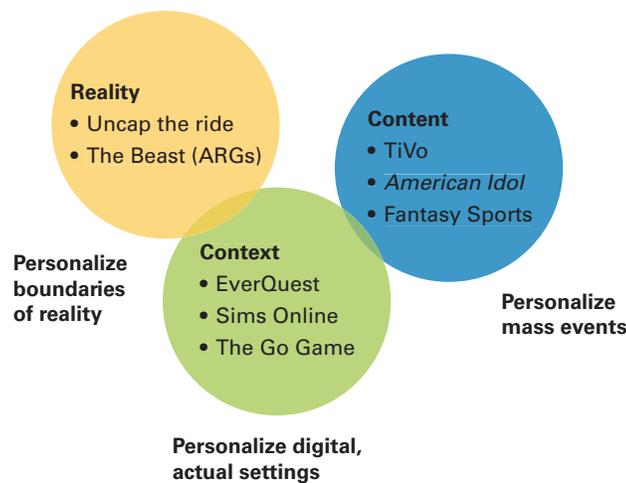
Entertainment media is a rich area for consumers to practice customization. Engaged consumers can experiment and learn in this

environment, and they will eventually have opportunities to carry those experiences into other areas of their lives. Andrea Saveri, IFTF Research Director, states, “Entertainment is a safe place to experiment and develop these kinds of practices. Over the next 3–5 years we are going to see these kind of practices trickling into other household activities—whether it is collective problem solving for a shopping or health ecology issue, or a work place related issue.”

#### Personalizing Mass Content and Events

Widespread adoption of the Internet, e-mail, and other forms of electronic communications has enabled consumers to transform mass produced and pre-packaged content into their own self-generated experience; for example, by participating in an online group discussion about a favorite sitcom or creating original

Figure 2–3  
Arenas of Customizing Entertainment



Source: Institute for the Future

characters for an online game. Forms of customization range from passive and limited forms of personalization to highly engaged and intensive experiences.

For example, Fox's *American Idol* allows viewers to phone or text message votes for the contestant that they would like to see go to the next round. During its second season, upwards of 20 million votes were cast per episode in the later rounds of the contest, and those votes are immediately tabulated and acted upon the following night. Even local news shows are allowing viewers to vote on which news stories they want to see reported on the following segment of the show. Consumers who vote are essentially interacting with mass media and enjoying a customized experience, even if they don't agree with the results of the vote.

Another example of personalizing mass-media entertainment is fantasy sports leagues—competitions where consumers create teams of professional players and compete for points based on how the players actually perform in the pro games. Yahoo!, the National Football League, Major League Baseball, and several others sponsor the fantasy sports leagues. People participate in live drafts for players for their own customized team, assign starters, and monitor their points based on how the real athletes perform in games. These fantasy leagues are intensely interactive—e-mails, instant messages, and chat rooms are used to develop strategies and make deals.

#### **Personalizing the Context of Entertainment**

A second form of customization is personalizing the context of the entertainment experience. For example, massive multiplayer online games such as *Sims Online* and *EverQuest* require “world building.” Players are online with thousands of other players across multiple countries, and they customize their charac-

ters' appearance, relationships, careers or endeavors—and whole contexts in which the characters appear. A key element of the game is customization and creativity.

This personalization can also happen in the physical environment. For example, *The Go Game* is a treasure hunt adventure game that takes place in the physical world, but is managed online. Teams compete to complete missions, using cell phones, laptops, and other devices to help organize themselves. The game planners send out clues and missions to teams of players. An example of a mission would be to build a sand sculpture in a playground and get a passerby to provide a one-word comment on it. Using their cell phone, the teams would send the single word description and digital photo of the sand sculpture to the game planner.

One important element that emerges from these games is the question of who owns the customization that is created by the consumers. In the case of *EverQuest*, Sony is trying to retain ownership of all aspects of the game. This is a problem for the players, as they must spend a lot of time and a fair amount of money building up points, doing activities, and solving various puzzles. Once some *EverQuest* players get important items or knowledge, they sell these resources to other players, for example on eBay. The problem is that, according to Sony, players are selling things that Sony owns. Alex Pang, IFTF Research Director, notes, “By [Sony's] standard, this is an illegitimate trade. But ultimately [Sony is] going to have to relinquish these claims because [players] are otherwise losing a significant motive of playing the game and playing in this world will disappear.” In this case, the better solution might be to work with players to make those exchanges part of the game, rather than focus on intellectual property ownership.

### Personalizing the Boundaries of Reality

Companies have been responding to consumers' experimentation by offering new ways to blur the boundaries between reality and fiction. One example of this blur is "alternate reality games," that subtly use entertainment and communications media to point players to both physical and virtual places. This genre of games combines interactive fiction, puzzle solving, and community building to create a distinctly customized experience. Negotiating the boundaries of what is "physical versus virtual," "real versus not," is a core element of the game.

One of these games, "The Beast," was developed when the Steven Spielberg movie *A.I.* was released in 2001. People noticed that there were clues on the posters and the movie Web site that led them to fake and real Web sites that all played a part of the unfolding series of puzzles that made the game.

One of the interesting things about these games is that they are typically solved by communities, rather than individuals. In fact, most of the puzzles are impossible to solve independently. For example, *The Beast* was solved by a community who named themselves the "Cloudmakers." (Today, Cloud-makers is an enduring organization that designs alternate reality games.) Such communities are vital to consumer customization. Kathi Vian, IFTF Research Director, put it this way, "Community is the foundation and glue that allows all of this consumer customization to happen."

### LESSONS FOR BUSINESS

These three examples of consumer customization—personal ecologies, technology work-arounds, and customized entertainment media—demonstrate the willingness of some consumers to engage customized products and services to meet their needs. And they suggest four important lessons for companies:

- *Customization is already here, and thriving.* Engaged consumers are already modifying purchased products and services to better reflect their needs and preferences. Companies should recognize this and respond to these unmet needs, work with consumers to develop different or better products, and start thinking about customization in broader terms.
- *Consumer customization occurs on a spectrum.* Not everyone wants to customize all products—and not all customization will be dramatic. Rather, consumers' experimentation with customization will reflect a varying range of engagement with the product or service. Companies will have to decide when and where to offer customized or customizable products to consumers, depending on how many consumers are interested and the costs involved for the affected products.
- *Consumers will push companies toward customization.* Watching and learning from engaged consumers often moves companies toward more flexible, dynamic, and customizable offerings. As consumers continue to experiment with new ways to meet their own needs, the pressure for companies to customize will increase.
- *Businesses today are not well equipped to deal with emerging issues related to consumer customization.* Consumers' customization may not show up in traditional market research. Instead, companies may be alerted to new customization in atypical ways, such as through intellectual property conflicts with customers, emerging intermediaries or competitors—or they may miss it altogether. Companies need new tools to identify how, when, and why consumer customization happens.

### 3. NEW TECHNOLOGIES AND MARKET FRAGMENTATION CREATE NEW MARKET LENSES



If consumer engagement was the only trend affecting customization, companies' responses could be simple—they could just segment their customers based on level of engagement, and track the leading edge. However, market fragmentation and new technologies are changing the dynamics of the marketplace, making mass customization more complex. Fragmenting markets are revealing new consumer needs, pains, and desires, all of which create even more diversity to customize around. Emerging technologies are revealing a new data layer and new opportunities for customization. Taken together, these shifts will allow companies to adopt entirely new perspectives on their markets and experiment with new forms of mass customization. We consider these drivers in this chapter. (For a more in-depth review on market fragmentation, new technologies, and new lenses, see companion report, *Beyond Consumer Segmentation: New Technologies, New Market Lenses*, IFTF SR-807 A.)

#### MARKET FRAGMENTATION GENERATES DIVERSITY

The markets most companies serve are becoming increasingly fragmented. The next ten years will see a growing diversity of lifestyles, consumer preferences, and choices, breaking down traditional market segments into smaller and more idiosyncratic niches. Market fragmentation will play out along three core dimensions:

- *Fragmentation of consumer populations.* Populations in developed and many developing countries are becoming increasingly diverse as a result of migration, extended life spans, shifting household arrangements, increasing levels of educational attainment, and increased access to technologies and information. As a result, the individual choices and pathways through life are far less predictable than they were 10–20 years ago and cannot be used as a guide to understand future choices, needs, and desires.
- *Proliferation of product offerings.* Consumer markets over the last 50 years have moved from a world of scarcity to a world of abundance—an abundance of products and choices about these products. This is partially the result of a continuous cycle of over-saturation and differentiation. As mass markets become saturated with offerings, companies offer ever more, but presumably different, products to avoid commoditization.
- *Multiplication of communication channels.* Media is one of the key institutions shaping people's values, lifestyles, and preferences. In today's age of more personalized media, people can access information that is targeted specifically to their interests and needs through numerous channels. Media becomes a force for increasing fragmentation rather than a unifying force and thus leads to a greater diversity of values, lifestyles, and product preferences.

### 3. NEW TECHNOLOGIES AND MARKET FRAGMENTATION CREATE NEW MARKET LENSES

Table 3–1  
Twelve Key Emerging Technologies

Technology	Transformative Quality
1. <b>Agent-based modeling</b>	Simulation tools and techniques model interactions of many individuals.
2. <b>Biometrics</b>	Tools create biological data on individuals (e.g., voice and facial recognition retinal scanning).
3. <b>Collaborative filtering</b>	Product evaluations, stated tastes, clickstreams, or transaction histories create a user profile, customized cross-selling, or up-selling opportunities.
4. <b>Digital printing</b>	Printers create large batches of multiple customized documents based on information received from a database.
5. <b>Intelligent algorithms</b>	Automated data mining uncovers emergent phenomena and automatically “learns” customers’ interests from a database.
6. <b>Peer-to-peer architectures</b>	Distributed storage and processing capture and manage consumer data from sensors.
7. <b>Physical tagging</b>	Radio frequency identification tags (RFID) monitor products and processes closely to see product location, movement history, or freshness.
8. <b>Positioning technologies</b>	Tools track the geographical position of people or things.
9. <b>Sensors</b>	Small sensors identify and track consumers, and continuously evaluate the quality of products.
10. <b>Soft tags</b>	Software generates electronic identities, standardizes and shares data across systems, and uses XML to track and access specific data.
11. <b>Web services</b>	Software quickly integrates different systems without individually coding interfaces between systems.
12. <b>Wireless technologies</b>	Large cellular phone networks or smaller Bluetooth or Wi-Fi networks moves information faster, easier, and into new places and spaces.

Source: Institute for the Future

## NEW TECHNOLOGIES WILL YIELD NEW CONSUMER DATA

New technologies are emerging that promise to both magnify the amount of fragmented consumer data, and also decipher new meanings underlying the data. Table 3–1 describes 12 emerging technologies that will transform how companies track and communicate with their markets. Many physical places and devices, such as stores, public spaces, automobiles, and appliances, will be embedded with these technologies. They will be able to sense, observe, capture, and transmit data, responding to people and things in the various environments in which they operate. They will enable new ways for companies to understand their consumers as well as create new product offerings to suit their needs. These technologies will:

- Make previously “invisible” data visible and quantifiable, for example, allowing companies to know more about a person’s biological characteristics and physiological responses (speech patterns, skin temperature, heart rate, and facial characteristics), the flows of people, things, and data through geographic locations, and patterns of behavior that emerge as large groups of people interact in public spaces.
- Provide data that is immediate (at the moment a particular customer interaction is taking place) and in context (that is, with information about the setting or environment in which the event is taking place).
- Allow for greater customization through easier identification and mapping the unique features of individuals, communities, and crowds.

The data generated by these technologies will allow companies to adopt entirely new

perspectives on their markets. This new data will also revitalize the paradigms that companies already use, allowing companies to use creative combinations of perspectives in order to get the information they need.

## MARKET LENSES

Market fragmentation and new technologies will allow companies to adopt new perspectives, or lenses, on their markets. Think of these perspectives as similar to the lenses used by optometrists to determine a patient’s prescription—the optometrist might ask the patient to compare multiple optical lenses to see which improves their vision the most. Similarly, companies will need to consider using multiple “lenses” to determine which gives them the clearest perspective on their customers. Some of these lenses will be similar to the ones companies use now—they may seek to segment their markets into large groups (the Segments Lens), track the preferences of individual customers (the Individual Lens), or understand customers’ actual patterns of product or service usage (the Experience Lens). Other lenses will emerge in tandem with new technologies, allowing companies to remotely sense the identity, location, or even mood of consumers (the Context Lens), understand how purchasing and usage are affected by consumers’ networks of friends and family (the Social Networks Lens), or capitalize upon emergent patterns in the behavior of large crowds of consumers (the Swarms Lens). Table 3–2 on page 18 summarizes the most important perspectives that companies may take on their markets.

Companies may use some combination of lenses to identify new market opportunities. Table 3–3, on page 19, takes a hypothetical example of how a business development team in a home-care product unit might use the

### 3. NEW TECHNOLOGIES AND MARKET FRAGMENTATION CREATE NEW MARKET LENSES

lenses to ask new questions about customer needs for home cleaning products. In the following chapter, we consider how this framework can be applied to mass customization.

#### LESSONS FOR BUSINESS

The changes brought about by market fragmentation and new technologies suggest three lessons for business:

- *Consumer populations are dynamic and multifaceted.* Pigeonholing consumers into traditional segmentation systems is only going to become more difficult; more flexible segmentation schemes will be required.
- *A new wave of data is coming.* New technologies are going to generate unprecedented amounts of data about people, things, and places. Similarly, new technologies to store, integrate, and analyze this data will also evolve. To avoid physical as well as mental overloads, businesses will need to decide which data they want to collect and how they plan to use the information.
- *New perspectives are needed on consumer markets.* The old perspectives won't capture new and important consumer information. Industry leaders will need to use new lenses to get the best focus on their markets. These new perspectives will provide businesses with valued points of differentiation for consumers.

Table 3–2  
Market Lenses Summary

<b>Lens</b>	<b>Main Use</b>	<b>Importance</b>
<b>Segments</b>	Identify homogenous groups that share product or service preferences.	Most widely used lens today; useful for reaching large markets.
<b>Individual</b>	Identify customers' unique preferences and purchasing behaviors.	The traditional focus of customization.
<b>Experience</b>	Identify practices and experiences related to actual product or service use.	Crucial for getting optimal design, features, or form factor.
<b>Context</b>	Identify consumer identity, location, and/or emotions.	Will generate contextual data for environments that are not "face-to-face."
<b>Social Networks</b>	Address the effect of other people upon consumers' purchasing behaviors.	Will allow marketing to entire networks of people.
<b>Swarms</b>	Identify and predict patterns of emergent consumer behavior.	Will find new patterns of consumer behavior; predict sudden shifts in demand.

Note: For detailed descriptions of the lenses see, *Beyond Consumer Segmentation: New Technologies, New Markets* (IFTF SR-807 A).

Source: Institute for the Future

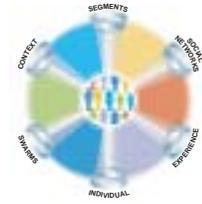
Table 3–3  
*How a Home-Care Unit Might Use Market Lenses to Identify New Opportunities*

<b>Lens</b>	<b>The Old Story</b>	<b>New Questions</b>
<b>Segments</b>	“Our target market is 18–49 year olds in family households.”	“Have we missed important segments (e.g., single-person households, cohabiting couples, or roommate situations)?”
<b>Individual</b>	“Inexpensive home-care products are not good candidates for costly personalization.”	“Are there high-end versions of our products that might have value for certain customers (e.g., new designer scents or different cleansing strengths)?”
<b>Experience</b>	“We treat all house cleaning as the same, although we suspect that consumers may actually have different cleaning needs for different parts of the house.”	“Can we identify a taxonomy of desired cleaning experiences with implications for our products (e.g., changing the form or certain features to create “easy and quick” cleaning products vs. cleaning products that create a luxurious “spa-like” environment)?”
<b>Context</b>	“We concentrate our products on certain shelves in stores.”	“Can we increase our market share in the store by changing the setting for our products, in order to satisfy shoppers with different needs (e.g., to meet the needs of utilitarian, grab-and-go shoppers vs. social shoppers)?”
<b>Social Networks</b>	“We believe that consumers are not interested in talking to each other about cleaning products.”	“Can we partner with existing online communities that have a natural affinity for these kinds of products (e.g., homemaker communities or health-related communities)?”
<b>Swarms</b>	“We track bursts in demand through point-of-sale data, obtained several weeks after the fact.”	“Can we monitor conversations in online communities to identify immediate shifts in demand or emerging uses for our products (e.g., unanticipated benefits)?”

Source: Institute for the Future



## 4. VIEWING CUSTOMIZATION THROUGH NEW MARKET LENSES



The new landscape of customization will require many shifts. Companies will need to move from considering themselves as the “providers” of customization, to “partners” or even “fast followers” of customers, as consumers will themselves customize their product by adding content or features. New technologies will allow multiple forms of customization to exist within the same product. And companies will adopt new perspectives on their markets that will facilitate different kinds of customization. Table 4–1 illustrates the differences between the old and new views about customization.

In this chapter, we give examples of how companies and consumers are likely to customize products when viewed through different market lenses, and we identify the most important implications for business.

*Table 4–1  
Changing Perspectives on Customization: Three Key Dimensions*

	<i>The Old View</i>	<i>The New View</i>
<b>Who Does It?</b>	The company does the customization.	The consumer customizes, the company may help.
<b>What Is Being Customized?</b>	Customize one element of offering (e.g., marketing, design).	Customize along multiple business processes.
<b>Who’s the Target?</b>	Customize to individuals or segments.	Customize to new markets—including to context, social networks, or swarms.

Source: Institute for the Future

## 4. VIEWING CUSTOMIZATION THROUGH NEW MARKET LENSES

### CUSTOMIZATION IN THE SEGMENTS LENS

Customization in the Segments Lens can take several forms, including communications that are customized to fine-tuned segments, or the development of new flexible, segmentation systems. Advances in communications technology let companies send customized messages to specific market segments. For example, in a recent advertising campaign, insurance company Mutual of Omaha used digital printing to create brochures for customers within five specific market segments—“new parents,” “self-employed individuals,” and so forth. Customers could review the targeted information in the brochure, then return a business reply mail postcard to get more information. The more finely segmented advertisements generated up to four times the response rate of Mutual of Omaha’s traditional mailings.



In the future, intelligent algorithms will make it increasingly possible to dynamically segment markets after products are released. Ford has already experimented with dynamic segmentation by generating clusters based upon the combinations of features (e.g., 8-cylinder engine, power windows, CD player) that customers purchase with their vehicles. This segmentation system allows Ford to track the evolving interests of its customers and find new groupings of preferences, rather than relying upon pre-determined standard demographic segments (e.g., soccer moms or baby boomers). Dynamic segmentation will enable companies to release a new product, then identify its market and immediately respond with the appropriate communications.

### CUSTOMIZATION IN THE INDIVIDUAL LENS

The Individual Lens is really all about the traditional story of mass customization—offering goods and services to individuals based on their stated or inferred needs, preferences, and interests. Sometimes the company may do this for customers—for example, Dell’s customers identify what they need in a computer, and Dell creates a customized computer with those components. Other companies provide tools that allow consumers to customize their own products, like mobile phone companies enable consumers to personalize their mobile phones with ring tones and faceplates.

In the future, customization in this lens also may involve new forms of data, such as information from biosensors. Customized offerings can work with individuals’ biochemistry or genetic makeup. For example, new foods, cosmetics, and medicines can be created that would be customized to an individuals’ genetic makeup.



### CUSTOMIZATION IN THE EXPERIENCE LENS

Several companies are pursuing customization in the Experience Lens by customizing the store inventory around desired shopping experiences. For example, Wal-Mart uses its immense data inventory and extremely responsive supply network to customize the mix of product offerings and to create customized shopping experiences in each individual store. The company calls the program the “store of the community.”

The company has been analyzing every purchase made over the last ten years, looking at the relationships between the items people



buy and hundreds of other variables such as time of day, price, weather, total sales per customer, local food, and holiday customs. The result is that Wal-Mart can anticipate the desired shopping experiences of customers in each of its stores. For example, the store in Shenzhen, China, is crowded with tanks of crabs, fish, frogs, and shrimp. Although hardly the kind of store you would expect to find in Arkansas or many other places in the United States, this is exactly the customized experience Shenzhen shoppers want.

New technologies that enable companies to provide customized responses to consumers (in real-time and in context, for example) will raise the bar of consumer expectations around product experiences. Consumers will expect more vivid and immediate experiences with products and services. Successful businesses will need to step up their level of interactivity and customizability for their products and services—even for products we now think of experience-poor.

In experience-rich virtual and in-store environments, consumers will be able to participate in the design and creation of their products. They'll be able to personalize along the way—and their choices and decisions will be new sources of data.

### CUSTOMIZATION IN THE CONTEXT LENS

In the future, consumers will want products that are sensitive to their environments. In some cases, consumers can take the lead in customization—for example, by creating multiple personal profiles on a mobile telephone (e.g., “network administrator,” “mother of twins,” or “Frank Sinatra fan”). If it's a Bluetooth-enabled phone that can automatically detect the profiles of



other nearby people with Bluetooth-enabled devices, consumers can choose to send the profile that fits that particular context (e.g., a professional conference, PTA meeting, or nightclub) to the other devices.

For other forms of customization, the company may need to take the lead. Understanding how customers use a product ultimately allows companies to design their products to flexibly and automatically interact with their environments. A great example of this is Volvo's Safety Concept Car (see Figure 4-1)—a car designed to automatically sense and respond to its environment. It incorporates a range of features designed to automatically adjust to changing contexts, such as adjustment of head-light beam patterns to light up the appropriate terrain as drivers change speeds or take curves, and sensing and alert features providing notification of cars located in the vehicle's blind spots.

Figure 4-1  
Volvo's Safety Concept Car



Source: Volvo

#### 4. VIEWING CUSTOMIZATION THROUGH NEW MARKET LENSES

##### CUSTOMIZATION IN THE SOCIAL NETWORKS LENS

The most exciting kind of mass customization in the Social Networks Lens targets networks themselves as the market, and allows the entire network to collaboratively customize products. For example, Microsoft is testing a new instant messaging and communications product aimed at teenagers and young adults. The Three Degrees software allows people to create groups in which up to ten people can participate in an instant messaging session. In addition, members of the group can also share photo, video, and music files. The messaging interface can be customized to the needs of the group, as groups can select a unique set of pictures, messages, music, and even icons to



use. Microsoft provides the tools, but people in the network customize the appearance and the content (see Figure 4–2).

##### CUSTOMIZATION IN THE SWARMS LENS

One of the more interesting examples of customization to swarms is Sainsbury's, a British grocery store chain. Using point-of-sale data, Sainsbury's modeled a host of consumer details, including time spent shopping in different departments, and preferences for certain products and brands. It found unexpected areas of congestion or swarming. These were then later leveraged to position sale items or preferred vendors. Sainsbury was able to adjust individual store layouts in response to customer swarms.

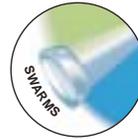


Figure 4–2  
Microsoft's Three Degrees



Source: Microsoft Corporation

Being able to forecast swarms and provide customized responses will become a critical competency over the next decade. This may be particularly true for service providers. Geoff Woodling, Director at Hutchison 3G, notes, “One of the issues for us is whether we customize our network. Unlike a conventional cell network where convergence is fairly uniform because people don’t impose radical demands on the network, the customer can actually increase the load on a broadband network by a factor of 20. In other words, where you expect your customers to be, you have to invest in increasing the capacity of the network.”

Although predicting and meeting the needs of swarms will be a crucial business need for service providers, consumer groups have recently started to develop these same skills for their own purposes to customize their experience of participating in a swarm. For example, Critical Mass, a social movement that started in San Francisco but has now spread around the world, organizes group bicycle rides in major cities to assert bicyclists’ rights to the road. There is no leader of these rides; rather participants use flyers, the Internet, and mobile tools to organize bicycle protests. Just imagine the power of such processes to protest specific companies or products (see Figure 4–3).

### LESSONS FOR BUSINESS

Instead of being relegated to niche products and companies, customization is going to emerge in diverse arrays of products, companies, and industries. Applying IFTF’s market lens perspective to customization suggests four lessons for business:

- *Get ready to reinvent customization.* Customization is no longer just about meeting individuals’ needs. Instead, customization is increasingly about creating changeable products and services that can fit into dif-

ferent environments, social situations, crowds, or groups.

- *Customize around core competencies.* Customization requires skill and deep knowledge to do successfully. Companies wishing to experiment with customization should start with areas where they are fully competent.
- *Provide customized service as a point of differentiation.* Customized service can be a way for players to differentiate themselves in commodity markets. Hank Jonas, Director at Kruger, remarks, “We produce a product [paper] that is exactly the same as our competitors. ... The way we have positioned ourselves in our industry is by customizing customer service. Kruger has always maintained its competitive edge by paying attention to its “customized service” to even the smallest customer.”

Figure 4–3  
Critical Mass Customizes Protests



Source: www.critical-mass.org

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#### 4. VIEWING CUSTOMIZATION THROUGH NEW MARKET LENSES

- *Use customization to find new touchpoints with customers.* Customization is not only about creating new products, it is about leveraging the products to identify new communication channels and retail venues as well. Mass customization should allow companies to find new points of contact with customers. Eva Andor, Senior Research Manager at Mars, gives an example: “We had several nation-wide campaigns to introduce new colors in our

M&M packs. ‘Colorworks’ is a natural extension of this and gives even greater opportunities for customization. Colorworks allows you about 20 or more different color choices of M&Ms; quite a few of those are not in our regular product line. ... Colorworks is offered in several new places, such as shops in malls. Normally they wouldn’t sell M&Ms there. So this opens up new opportunities and new touchpoints with customers.”

## 5. STRATEGIES FOR REINVENTING CUSTOMIZATION



Customization can occur within multiple business functions—design, production, communication and marketing, delivery, and customer service—and a range of consumer groups. But where should you begin? Simply listing customization options will not get you very far—you need a systematic way to develop and evaluate customization strategies.

In this chapter, we diverge from our content focus in Chapters 1–4. We will instead illustrate a practical process for developing customization strategies. With a broad range of creative and feasible alternatives, businesses can then evaluate and select the best one.

### STRATEGY TABLES: A TOOL FOR DEVELOPING CUSTOMIZATION STRATEGIES

A practical and systematic way to think through the variety of options available for customization is to use a strategy table. Strategy tables are tools used to develop integrated company strategies. In this case, we are using them to organize the set of decisions that define reasonable alternatives for reinventing customization.

*“Decisions are what we can control by our actions. Uncertainties are what we cannot control, but we may be able to influence. We take risks by making decisions in the face of uncertainties.”*

*—Burke Robinson, IFTF Director*

Figure 5–1 on page 28 shows the basic form of a strategy table, adapted in this case to address opportunities for customization. The headings for the columns identify the categories for decisions that need to be made. In this case, different market lenses and different business functions are used to define nine categories. Decision options within each category (column) typically range from “mild” to “wild,” from no change to major changes, and/or from spending few

resources to initiating major programs.

The process of developing a strategy table usually involves three steps:

- *Idea generation.* Brainstorm multiple ideas for decisions that can be made in a decision category that is defined by a particular lens and business function. (For example, “improve our customer service experience by using voice recognition technologies in automated phone lines to identify frustrated customers, then shift them to live agents.”)
- *Idea sorting and arranging.* Arrange these ideas in the table so that they represent mutually exclusive options, ranging from “do nothing” to “do something bold.”
- *Strategy creation.* A strategy is a meaningful path through the table that is consistent with a particular theme. A handful of these strategies can be analyzed to find the one that delivers the most value for the company.

**A WIDE RANGE OF CUSTOMIZATION OPTIONS**

At our April 2003 Business Horizons Conference, participants formed small groups to practice developing “mild to wild” ranges of customization ideas. Each group covered a different combination of business functions (e.g., design, production, and marketing/communications) and lenses (e.g., networks, swarms, and context). The groups were not required to focus on a single industry or company offering. Taken together, their ideas represent a remarkably diverse composite of customization opportunities. Their responses are shown in Figure 5–2.

**A SAMPLE STRATEGY TABLE: MOBILE PHONE CUSTOMIZATION**

Within any given company, executives use strategy tables to develop alternative strategies for their business. Figure 5–3, on page 31, shows an example of how executives at a mobile

phone company could organize their decision options and develop strategies for responding to the opportunities available through customization of mobile phone products and services. We have highlighted three strategies as an illustration; in practice, the decision makers would want to identify from three to seven equally attractive, alternative strategies to evaluate against future scenarios.

During a comprehensive evaluation, executives would want expert assessments about likely ranges of the most critical uncertainties in future scenarios. They would then analyze each of the three to seven different strategies as it plays out in each of the possible scenarios of the future. For example, to evaluate the customization strategy illustrated in Figure 5–3, executives would identify experts to assess the probabilities of key uncertainties such as technology development, competitor actions, consumer responses, and market share. Next, they would ask analysts to model

Figure 5–1  
Strategy Tables Are Used to Develop Alternative Strategies

THEME	DESIGN			PRODUCTION			MARKETING/COMMUNICATIONS		
	Networks	Swarms	Context	Networks	Swarms	Context	Networks	Swarms	Context

Source: Institute for the Future

Figure 5-2  
Results of Small Group Exercise: A Range of Customization Opportunities

	D.E.S.I.G.N.			P.R.O.D.U.C.T.I.O.N.			M.A.R.K.E.T.I.N.G.		
	NETWORKS	SWARMS	EXPERIENCE and CONTEXT	NETWORKS	SWARMS	EXPERIENCE and CONTEXT	NETWORKS	SWARMS	EXPERIENCE and CONTEXT
	<p>Design for network characteristics: ~nature of connection ~node leader</p> <p>Design for network effects: Increased value when many use it</p> <p>Joint design by company and network</p> <p>Network designs its own product</p> <p>Network designs product on the fly ~ à la opensource</p>	<p>Use modular designs to adapt to needs of swarms</p> <p>Involve swarms in design process by: ~design contests that catalyze a swarm ~iterative testing and prototyping</p> <p>Design for quick, cheap, single-use products</p> <p>Design for in-situ production</p> <p>Design products that act differently depending on the characteristics of a swarm</p>	<p>Design for characteristics of context: ~social ~environmental conditions ~physical &amp; virtual</p> <p>Design for time and location</p> <p>Embed design team in the context</p> <p>Include embedded contextual info in the product</p> <p>Embed the product in the context</p>	<p>Use the network to provide fast feedback to production</p> <p>Convert the supply chain to a supply network</p> <p>Link production to hubs &amp; nodes in the network</p> <p>Integrate the network into production by giving them tools</p>	<p>Focus on timing: short runs, just-in-time, dynamic pricing (especially in services)</p> <p>Focus on geography: small-scale distributed plants or do-everything plants everywhere</p> <p>Co-locate partners along the supply chain</p> <p>On-demand mobile production ~ street vendor</p> <p>Self-destructing products</p>	<p>Customize production to different context-based templates</p> <p>Batch production around contexts that repeat: -holidays -sporting events</p> <p>Use distributed manufacturing (close to contexts and local knowledge)</p> <p>Customers, enthusiasts become producers</p> <p>Products self-adapt to context</p>	<p>Viral e-mail marketing</p> <p>Target mavens (with samples)</p> <p>Target diasporas</p> <p>Sponsor network events (Tupperware)</p> <p>Create a network (à la Oprah)</p> <p>Hire "maven" actors to infiltrate the network</p>	<p>Scan current events for likely swarms to target</p> <p>Brand a swarm with an ad hoc symbol</p> <p>Create piggy-back incentives for swarms</p> <p>Create a swarm through: ~giveaways ~Massive open air siren ~Pheromones</p>	<p>Lease for context (don't sell)</p> <p>Cross-sell to related contexts</p> <p>Market to "causes"</p> <p>Convert contexts to permanent markets</p> <p>Combine location-based messaging with tracking (vanity billboards)</p> <p>Use context sensing to tailor marketing message</p>

Source: Institute for the Future, Business Horizons Conference, April 2003.

the scenarios resulting from combinations of these uncertainties and to summarize the risk and return of the strategy as it is analyzed against all uncertain scenarios. Finally, the executives would examine how this customization strategy compares to other alternative strategies before selecting the best approach.

The strategy table is the first of many decision analysis tools and techniques that IFTF will be introducing in future Business Horizons reports and conferences. Our intent is to provide businesses with a toolkit full of techniques and approaches for making better decisions in an uncertain and risky world.

## LESSONS FOR BUSINESS

The lessons for business are in the form of suggestions for how to improve strategic decision-making processes:

- Generate a wide range of options (from mild to wild) for each decision category.
- Identify three to seven alternative strategies as meaningful and consistent paths through a strategy table.
- Include probability assessments from experts, models of scenarios, and comparative analysis of strategies to determine the best way to respond to an uncertain and risky world.

Figure 5–3  
A Sample Strategy Table for a Mobile Telephone Company Considering Customization

THEME	DESIGN			PRODUCTION			MARKETING/COMMUNICATIONS		
	Networks	Swarms	Context	Networks	Swarms	Context	Networks	Swarms	Context
Stick to Our Knitting	None	None	None	None	None	None	None	None	None
Mass Hybridize	Add text messaging, chat, and IM for group network lists	Add maps of traffic flows, movement of friends	Add band of network switching, luminescent features	Mass produce	Mass produce	None	None	None	Use context-specific pop-up ads
	Above + add gaming and exchange of photos, music, and ring tones	Above + add spontaneous promotions and events notification	Above + add biometric tagging, reading digital graffiti (RFID)	Modularize to specific network patterns	Produce on demand in real time for short use disposable devices	Mass produce	Market to hubs	Conduct promotions based on locations	Advertise context features by in stores by geography
Go Wild: Reinvent Our Products and Services for New Consumer	Above + add conference/knowledge management functions	Above + add 3D mapping from phone video images	Above + add features for fishing, golf, baseball, ...	Modularize to individual network patterns	Produce from organizers' tool kits	Produce for single context use (ball games, hobbies)	Make it visible where networks congregate	Increase visibility in heavily congested areas	Live displays as passing by vanity billboards
	Above + add personal flow track, group memory, and network analysis	Above + add viral gaming with strangers	Above + add digital tourist guidebook	Consumer configuration	Produce from small, flexible, temporary, mobile units	Plan production runs around context	Create networks around product	Create a swarm	Phone as point-of-sale for context-specific features
				Automatic configuration based on patterns of use	Viral production by swarms	Produce just-in-time and just-in-context		Create a swarm around a viral game	

Source: Institute for the Future



## 6. CONCLUSION: THE CHALLENGE OF REINVENTING CUSTOMIZATION



So what have we learned about reinventing customization? Contrary to the opinion of some observers, the death of customization has been greatly exaggerated. In contrast, it is alive and well as a strategic response to new technologies and new market lenses.

Customization will be transformed into a ubiquitous process—but it will be a different sort of customization. While businesses will still focus on reaching and maintaining a large market without increasing costs, the processes of customizing and targets of customization may change dramatically.

Moving into the future, customization will be applied across multiple business functions and will rely upon new technologies to integrate data streams. It will also be marketed beyond individual needs to communities, villages, crowds, or even places and situations. Engaged consumers will push companies to customize in a wider range of offerings and settings.

To master these shifts, companies will need new strategies to customize their products and services. This will require working alongside consumers to help them customize their own products, customizing along the entire product cycle, and adopting new perspectives on the marketplace.

### BUSINESS IMPLICATIONS

Reinventing customization will have the following market, technology, and strategy implications for business:

- *As they watch and learn from consumers who customize, companies will move toward more flexible, dynamic, and highly customizable offerings.* Engaged consumers are already modifying purchased products and services to better reflect their needs and preferences. As consumers continue to experiment with new ways to meet their own needs, the pressure for companies to customize will increase. Companies should recognize this and respond to these unmet needs, work with consumers to develop different or better products and services, and start thinking about customization in broader terms.
- *Businesses will need new tools and offerings to deal with consumer customization.* Customization may not show up in traditional market research. Instead, companies may be alerted to new customization in atypical ways, or they may miss it altogether. Companies need new tools to identify how, when, and why customization emerges. Customization, no longer just about meeting individuals' needs, is increasingly about creating changeable products and services that can fit into different environments, social situations, crowds, or groups.

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## 6. CONCLUSION: THE CHALLENGE OF REINVENTING CUSTOMIZATION

- *Businesses will want new perspectives on consumer markets.* Old perspectives, such as pigeonholing consumers into traditional segmentation systems, won't capture new and important consumer information. More flexible classification systems and new market lenses will provide businesses with valued points of product differentiation for consumers. Customized service can also allow players to differentiate themselves in commodity markets.
- *Businesses will need to decide which data they want to collect and how they plan to use the information.* New technologies are going to generate unprecedented, and at times overwhelming, amounts of data about people, things, and places—similarly new technologies to store, integrate, and analyze this data will also evolve.
- *Businesses will identify consumers who are the most engaged with their offerings and then identify the best products and services to customize for specific markets.* Not everyone wants to customize all products—and not all customization will be dramatic. The way consumers customize will reflect a varying range of engagement with the product or service. Companies will have to decide when and where to provide customized or customizable offerings, depending on factors such as the number of engaged consumers, the costs of the affected products and services, and the specific features offered.
- *Just because you can customize something, doesn't mean you should.* Consumers want to focus on their needs, but not an invasion of their privacy. Companies experimenting with customization should stick to areas where they have the necessary knowledge, skills, and competencies. Customization will be a point of differentiation, but it should not be attempted lightly. Potential returns will need to be attractive enough to justify the investment and the risks.

## EPILOGUE: ONE FINAL CHALLENGE— CUSTOMIZATION AT THE BASE OF THE PYRAMID

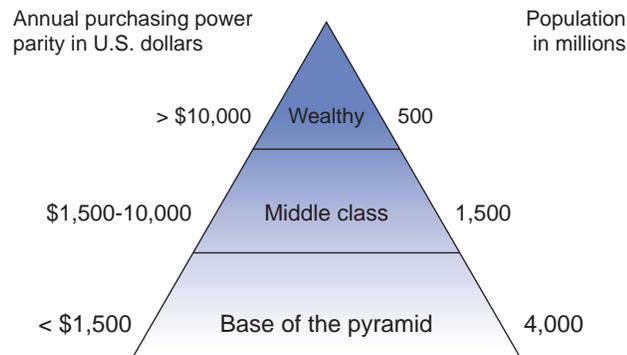


Customization can happen in developing markets too. In fact, these markets may be where the richest opportunities lay for applying new market lenses. In this epilogue, we challenge businesses to look creatively at future opportunities for customization in the world’s poorest markets.

Consider the world’s population by their income levels (see Figure E-1). About 500 million people form the wealthiest segment—the segment that includes most consumers in developed nations (which is only 8% of the world’s population). However, as companies have targeted these wealthiest of consumers, they have over-saturated them with offerings. Given the slow growth of this segment, the profit opportunities targeting these marquee customers are eroding. In response, companies are increasingly tapping into under-targeted downstream segments.

In particular, some multinational companies are now trying to reach what Ted London, Director of the Base of the Pyramid Learning Laboratory, University of North Carolina, Chapel Hill, calls the “base of the pyramid” (BOP). This population, approximately 4 billion people or two-thirds of the world’s population, has purchasing power parity of less than US \$1,500 annually. These individuals are primarily, although not exclusively, in the developing nations. In fact, about 10 million Americans belong to this category. People at the BOP typically live in rural villages, so they can be tough to reach. Their education is relatively limited and their markets are unorganized and local in character.

*Figure E-1*  
*The Pyramid*



Source: University of North Carolina, Base of the Pyramid Learning Laboratory.

The common notion about people at the base of the pyramid is that they are best served by government and by nonprofits, rather than corporations, because they do not have the infrastructure, institutions, financial capital, or assets of wealthier people.

But there is an alternative view—that there is a huge opportunity at the BOP. While markets seem disorganized, there are highly developed informal economies. As much as 40-60% of the economic activity in some developing countries goes unrecorded, often because it is too difficult to bring economic assets into the formal economy. There are also informal institutional boundaries. For example, a person who goes out walking at night in rural Africa may get close to someone's property and start hearing his or her dogs bark. Then as the person leaves that property and goes to the next—those dogs stop barking, others start. The dogs know the property lines, and the people do too.

Targeting the BOP market is an alternative strategy to an “emerging market” or country-by-country strategy. And operating in BOP markets is being supported by global policy makers, who are becoming more open to the possibility of new partnerships between non-governmental organizations (NGO), governments, and businesses. In addition, ongoing experiments by large multinational corporations are having some success reaching this market. Examples include Hindustan Lever's new detergent offering, Procter & Gamble's (P&G) efforts to reach Indian women with drinking water treatments, and Hewlett-Packard's (HP) work with small businesses in India. What the three have in common is their creative use of different market lens perspectives to offer customized solutions to the base of the pyramid.

### **NIRMA AND HINDUSTAN LEVER: LEVERAGING SOCIAL NETWORKS IN RURAL INDIA**

In the mid-1990s, Hindustan Lever (the Indian subsidiary of Anglo-Dutch multinational Unilever) had the largest market share of detergent, but its traditional focus had been the top of the pyramid in India. Nirma, an Indian company, developed a new formulation of detergent designed and priced to reach the BOP market. Nirma had an innovative distributed processing and packaging model: instead of one centralized factory, Nirma had many small factories in villages. Using villagers as the factory workers also helped with advertising, so that Nirma became ingrained into communities' social networks. This model was very successful, so that by 1999, the company had approximately 400 distributors and reached 2 million retailers, with \$150 million in sales.

Hindustan Lever saw that it was vulnerable, not only because of what was already happening with Nirma at the BOP, but also because it began to see the Nirma business moving up-market. Hindustan Lever responded by adopting Nirma's models, but also adapted it by bringing along its unique knowledge as a multinational company.

Like Nirma, Hindustan Lever also used local suppliers, who spread word throughout their networks. Hindustan Lever was also able to improve upon Nirma's supply model by providing training and certification to Hindustan Lever's 2000 local suppliers, so they could bring the quality of their suppliers up, and by using modeling to determine the most efficient ways to get products out to the 600,000 outlet villages. It also developed a new pricing model. Instead of using the traditional model of gross margin, setting the cost

first and then the price, they did the opposite. Hindustan Lever set the price first, then figured out how to make it for that price.

By utilizing the social networks of their rural workers, Hindustan Lever successfully grew its BOP market. Today, Hindustan Lever's BOP market is growing at 12.5% annually, and 55% of its total sales (about \$10 billion) come from the BOP.

#### **P&G: DOING GOOD BY UNDERSTANDING BOP EXPERIENCE**

A different approach to the BOP market is to create a totally new business from scratch that would be attractive to multinational corporations. This approach is based on achieving a deep understanding of experiences at the BOP. Drinking water is an excellent illustration.

According to the United Nations (UN), there are currently 1.2 billion people on the planet (about 1/5 the world's population) who do not have access to safe drinking water. In 2000, the UN set a goal to halve this number by the year 2015. But in practical terms, meeting that goal means that safe drinking water would need to be delivered to 250,000 new people each and every day over those 15 years.

Frequently, the solution to this is framed in terms of large bricks, mortar, and pipe infrastructures. But according to George Carpenter, Director of Corporate Sustainable Development at Procter & Gamble, the only way to solve a problem of this scale is through the marketplace. He asks, "What if you assume we never will have this money to build this infrastructure? P&G decided to approach the issue in a manner analogous to cellular and digital communication where the developing world will never build the hard-wired infrastructure that exists in developing countries, and look at treating ... water, nutrition, and a whole host of things at the point of use—whether that is in a village or slum or in a palace."

In the case of drinking water in India, this means understanding the role of water in women's lives. Water controls many women's lives—from the time a woman gets up at six in the morning until the time she goes to bed at eleven at night—because it is only available for a couple of hours a day, even among the middle class, and it must be boiled. Many girls don't go to school because they must retrieve drinking water for their families, which can mean carrying water a kilometer each way, everyday. By treating the contaminated water within the home so it becomes potable, these women can get back several hours of their time per day.

P&G's water treatment product, although well received in their field studies, has not yet gone to market. Although the technology is there, it has not figured out the business model. National companies who already do business in these markets can compete within a market, but multinationals have the advantage of being able to deliver a single offering in 20 countries in a year. And yet there are significant volume versus margin versus scale tradeoffs to be considered.

#### **HP: USING CUSTOMIZED SWARMS AS THE USER PARADIGM**

Gary Herman, Director of Emergent Systems at HP, notes the challenges of innovating in a low-margin market. Today, HP's high-volume commodity PCs are not affordable to consumers in places like India, except for the top 2 million households with the highest incomes. In the business marketplace, there is such price sensitivity that HP products cannot compete with the prices of locally assembled PCs. Furthermore, introducing cheaper PCs runs the risk of cannibalizing existing higher-end markets.

But as Herman argues, "If you think differently about the use model, you can actually reduce the per seat cost of the PC without

■ ALIGNING COMPANIES AROUND BOP INITIATIVES

The challenge we have in the company is that it is an \$80 billion company and [BOP initiatives are] speculative and they are small. So when you have huge volume businesses under tremendous cost pressure, and you are offering up things that look like distractions, or which are threats if you think about the PC business dynamics, the dilemma in the company is how to give [these initiatives] the attention they need without breaking from the leverage they get off of the strengths of the business.

—Gary Herman, Director,  
Hewlett-Packard

Recrafting ex-Soviet enterprises was fulfilling for our staff, but we had to be creative about how we priced it. We had to strip down and unbundle the traditional services that we had offered. We took a lot of flack for doing that from offices in more developed countries. We would often get a call asking, “what are you doing? You can’t provide an audit like this.” We would consciously tell them, “it is not really an audit, it is more of an opinion about X, Y, Z.” We helped outsiders separate the credible opportunities from the mafia-fronts, and that’s what they wanted to know from an international investment point of view.

—John Kutz, Senior Manager,  
Deloitte & Touche

If you can be successful of proving a business model [at the BOP], all of a sudden you empower the whole creative engine of the corporation from the R&D through the supply chain through the marketing advertising. When it becomes in the company’s self-survival interest, all of a sudden the amount of resources that goes forward are immense—[and so is] the scale with which you can do it.

—George Carpenter, Director,  
Procter & Gamble

deviating from the basic high-volume PC paradigm.” According to Herman, a lot of aggregate consumption occurs within small family businesses, even including consumption of expensive items.

One way for HP to meet BOP needs in this situation is to offer single computers that support four graphics cards, four monitors, and four keyboards. The use paradigm is then set to meet the needs of consumer swarms—clusters of users in schools, cybercafés, or training centers. This model makes it possible to reduce the per-seat cost by at least a factor of two, retain good margins, and compete with local low-end products. As an added benefit, the product is not particularly cross-elastic back into the Western markets, where people are more interested in individual use of PCs—so it does not threaten existing business.

#### KEY BUSINESS STRATEGIES FOR REACHING THE BOP

Panel members and participants at our April 2003 Business Horizons Conference proposed five strategies for reaching the BOP:

- *Find places with “rule of law.”* Governments play an important role creating the

kind of framework that would allow multinational companies to do business. Many countries are not appropriate for BOP initiatives—not because of widespread poverty, but because of bribery and corruption. The *Wall Street Journal* and the Heritage Foundation publish the “Index of Economic Freedom” that shows the relationship between per capita income and rule of law characteristics (e.g., absence of bribery and corruption) for every country in the world (see Table E-1). There is a strong exponential relationship between rule of law and per capita income. Strengthening the economic freedom creates the conditions to raise the per capita income.

- *Partner with governments and NGOs.* Governmental organizations and NGOs should be used as resources to leverage existing networks or infrastructures, share costs, and distribute risks. For example, Procter & Gamble partnered with local health ministries to disperse the formidable marketing costs of creating whole new markets for Crest Toothpaste in Poland, Russia, and China—places where Western dental hygiene practices were not well established.

Table E-1  
Increasing Economic Freedom Creates Conditions for Higher Income

	Economic Freedom Score*	Income per Capita**
United States	1.80	\$34,142
Canada	2.05	\$27,840
Argentina	2.95	\$12,377
Iran	4.15	\$5,884
North Korea	5.00	\$1,000

\* Economic Freedom Scores range from 1.00 (free) to 5.00 (repressed).

\*\* Income per capita is in 2000 GDP measured in purchasing power parity.

Source: *Wall Street Journal* and The Heritage Foundation

- *Determine the cost first, then how you can make it.* The key to reaching the price-sensitive BOP market is to hold costs down. For some products, this may mean starting with the desired end cost, then deciding how it can be made and delivered at that price.
- *Track job creation.* New BOP products and services can have an impact far beyond the initial purchaser. They can provide jobs and additional income streams for entire communities, and that in turn makes them more attractive markets. Mary Cain, IFTF Research Director, notes, “It’s really about creating jobs for an entire community. Not just the person who is selling the cell phone, but also the person who is using a new water pump to create a farm, and that farm has flowers that are exported out of the country. ...My friend created 19,000 jobs in Kenya as a result of this grassroots marketing. That unit of analysis may be the way to increase the aggregate value [of the market.]”
- *Generate positive internal recognition.* Given the potential threat that some BOP models pose to established business paradigms, executives need to be creative in how they frame their message to internal audiences. Gary Herman of HP recalled a recent innovation event for all of HP’s R&D and marketing teams from around the world. Each group had its own tradeshow

exhibition, but Herman’s group created a “village” in the center of the exhibition site. The village featured seven or eight small entrepreneurial initiatives, which by themselves would have been too small to make an impact, but received very positive feedback when placed together.

#### CUSTOMIZATION AT THE BASE OF THE PYRAMID

Mass customization in BOP markets is a new and underdeveloped idea—but it is just as interesting as customization initiatives occurring at the top of the pyramid. In fact, mass customization may find its’ best expression in these underserved markets. Marina Gorbis, IFTF Research Director put it this way, “The ultimate customization is probably not here in developed countries, it is in developing countries and underserved markets. Because, as much as we talk about market fragmentation here, we are all living in the same world. People at the top of the pyramid all have the same infrastructure—we basically all have the same “stuff” and speak the same languages to a greater or lesser degree. When you get into these other communities, you really see what diversity is. Every village may have a very different infrastructure or community structure. The ultimate test of customization is probably in these communities.”