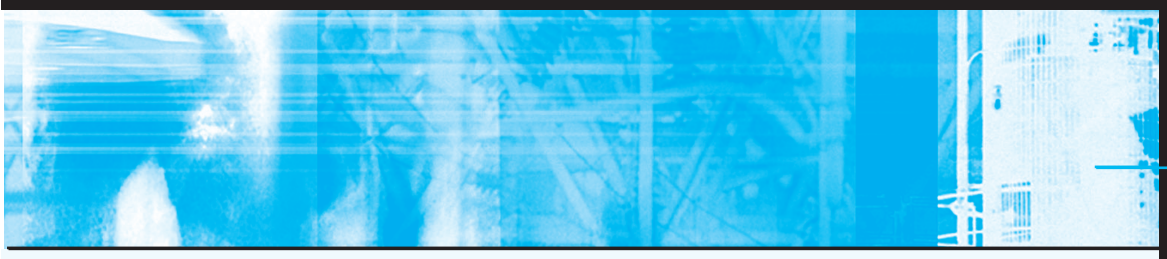


PART 2

Designing the Delivery System

The idea seems simple and obvious: The service delivery system—the equipment, facilities, type of personnel, procedures—should be designed to meet the overall corporate strategic directives. Even though it is simple and clear to state, it often proves difficult to perform in practice. Everywhere one looks one can find service firms that profess to stress one attribute but design processes to support another. Two of the examples cited in the chapters ahead include a doughnut retailer that builds a business on freshness and taste, yet decides to centralize all baking in a metropolitan area to cut costs, and a bank that advertises personal service, but all telephone calls to local branches are routed to a nationwide call center hundreds of miles away.

This section provides conceptual tools for integrating the service delivery system with the overall corporate strategy.

Chapter 5 concerns the genesis of strategic linkage to the service delivery system, the new service development process. The chapter contains both concepts and mathematical models to assist in this process.

Chapter 6 considers the management of the apparent next logical development of the service economy, the "experience" economy, wherein customers pay not merely for a transaction, but for the emotion or intensity of feeling an experience generates.

The growth of service firms that can take advantage of scale economies and the rise of electronic transmission of information in the last few decades mean a disassembling of the processes previously performed in a front office. The number of traditional service procedures that take place in geographically distant back offices where the customer is never seen continue to increase dramatically. A strategic template that guides when to decouple service functions and how to do so is contained in Chapter 7 and 8.

CHAPTER

5

New Service Development

LEARNING OBJECTIVES *The material in this chapter prepares students to:*

- Understand the new service development process.
- Choose appropriate tools for making decisions in new service design.
- Understand the different design attributes and their strategic implications.

Services are now the dominant economic sector in most modern Western economies. With trends of increasing globalization and new technologies, contemporary businesses realize that in order to survive, they must continuously develop new services and products. A *new service* is defined as an offering not previously available to customers. It can be the result of additional offerings, radical changes in the service delivery process, or incremental improvements to existing service packages or delivery processes that the customer perceives as new (Johnson et al., 2000). So, for example, the majority of Internet service activity that emerged over the last five years falls under this definition. On one end of the continuum, we see incremental additions from existing catalog companies like Lands' End that supplemented their mail-order catalog with a new Internet catalog and ordering processes. At the other end, companies like eBay developed a radical new service innovation, the online auction. In this chapter, we first give a broad overview of the actual process of new service development. Then we cover three key aspects of new service development: service innovation, service system design, and service system design tools.

New Service Development Process

In the past, new service developers often did not follow the traditional new product development path, but instead developed their own ad hoc processes. They took this approach for several reasons. Due to the intangible nature of services, it is difficult to prototype and field test a new concept. Additionally, most service firms lack formal research and development departments (Gadrey et al., 1995). Even though providers are often slow to adopt formal new service development processes, the successful service providers are more likely to emulate new product development methods (Griffin, 1997). Generally, a formalized service development process consists of four key steps: design, analysis, development, and full launch (Johnson et al., 2000).

The process could be conceptualized as a sequence from design through launch or a full cycle if a continuous improvement approach is included. In actuality, the process tends to be nonlinear and iterative. Design and analysis are *planning* activities, while development and launch are *execution* activities. The design stage covers the formulation of a new service objective and strategy, idea generation and screening, and concept development and testing. The analysis stage includes business analysis and project authorization. The development stage addresses the complete service design and testing, process and system design and testing, marketing program design and testing, personnel training, service testing and pilot run, and test marketing. The launch is the full-scale launch and postlaunch review.

At the heart of the model sits the service delivery system: the people, technology, and systems that go into designing and delivering the new service. Organizations that continuously develop successful new services tend to organize their people into cross-functional teams, provide them with appropriate tools and resources for planning and execution, and develop an organizational context that facilitates the entire process so that products can be developed quickly and effectively. In the next section, we will look at how this model can contribute to new service innovations.

Service Innovation

Lovelock (1984) first classified new services as shown in Table 5.1. In the new service development process, it is important to differentiate between the radical and incremental innovations. Radical service innovations require a different process and design approach than incremental innovations. A radical innovation is either new to the world or new to the market. Recent radical innovations include online auctions such as eBay and Priceline.com or facilitating services such as Century 21 Realty; both of these concepts bring together buyers and sellers and provide information and advice for both parties. Usually, the radical innovation is developed through some form of the new service development cycle. After the innovation is launched, its development process becomes the foundation for further incremental innovation. Firms that continuously cycle through the process steps can build service innovation competence.

Innovative service firms utilize "enablers" who facilitate the new service development cycle. These enablers reduce the development cycle time and allow service developers to design service delivery systems that meet the customer needs. For example, United Airlines made successful use of 22 cross-functional teams in the design of the Shuttle by United flights. After the Shuttle was operational, these enablers facilitated incremental improvements through periodic design/development team "huddles" (Kimes and Young, 1997).

The incremental or radical nature of the service innovation will dictate where the firm should devote resources. Incremental innovations usually involve some minor adjustment to the existing service delivery components (people, systems, and technology). Hence, fewer resources and less effort are devoted to the planning side and more devoted to the execution side of the process cycle. For example, if McDonald's wants to offer a new sandwich, the delivery system designers would consider not only how the new item would be made in the kitchen, but the assembly technique, cooking equipment, additional labor and inventory requirements, marketing plan, and information system adjustments for inventory and pricing as well.

Radical service innovations imply increased risk and resource investments. Here a large amount of planning is needed to flesh out the idea along with committing substantial resources to the new service development process. Similarly, the execution side must be equally supported with significant effort and resources. Consider the planning

TABLE 5.1: *New Services*

New Service Category	Description	Example
Radical Innovations		
Major innovations	New service for markets as yet undefined; innovations usually driven by information and computer-based technologies	Online auctions such as eBay and Priceline.com; facilitating services such as Edward Jones Financial
Start-up business	New services in a market that is already served by existing services	Travelocity, Internet travel planning, allows automated travel agency service
New services for a market presently served	New service offerings to existing customer of an organization (although the services may be available from other companies)	Free-standing bank branches or kiosks in supermarkets or other retail establishments
Incremental Innovations		
Service line extension	Augmentations of the existing service line such as adding new menu items, new routes,and new courses	Southwest Airlines adding Fresno as a new destination; McDonald's adding a new sandwich
Service improvement	Changes in features of services that currently are being offered	Delta Airlines' and British Airlines' use of ATM-like kiosks to distribute boarding passes to passengers
Style changes	The most common of all "new services"; modest forms of visible changes that affect customer perceptions, emotions, and attitudes, on-site with style changes that do not change the service fundamentally, only its appearance	Funeral homes that offer abbreviated ceremonies that celebrate life instead of mourning death, on-site full-service flower shops, and a brighter appearance

involved with eBay online auction activities and the flawless execution that was required when the product was launched. With issues of trust, product and money exchange, and valid and timely site information, eBay required substantial efforts and investment in all aspects of the process cycle to successfully launch the radical new service concept.

Service System Design

The initial part of the planning cycle tackles the development of a service concept and operating strategy (see Chapter 2 for in-depth discussion of strategic service vision). Once these elements are formulated, the next stage covers decisions related to the service process or delivery system design to produce the service concept. Good service product and process design provides the key to success for a company. Surprisingly, even the smallest service design detail can affect the bottom line as shown in Table 5.2. Even an interaction detail such as wait-staff introducing themselves increased their tips by a whopping 53%.

All service design factors should relate to the service strategy and concept. Generally, the key factors include location, facility layout, product design, scheduling, worker skills, quality control and measures, time standards, demand/capacity planning, industrialization level, standardization of service offering, customer contact level, front-line personnel discretion, sales opportunity, and customer participation.

TABLE 5.2: *Summary of Study on Employee Actions and Restaurant Tipping*

Tip-Enhancing Action	Average Tip: Control Without Treatment	Average Tip: Experimental With Treatment	Percentage Increase in Tip
Introducing self by name	15%	23%	53%
Squatting next to table:			
• Waiter	15%	18%	20%
• Waitress	12%	15%	25%
Smiling	$0.20	$0.48	140%
Wearing a flower in hair	$1.50	$1.75	17%
Entertaining customer			
• Tell a joke	16%	19%	40%
• Give a puzzle	23%	22%	18%
Suggestive selling	$1.25	$1.53	23%
Repeat order to customer	1.36 DG	2.73 DG	100%
Touching customer			
• Study 1	12%	17%	42%
• Study 2	11%	14%	27%
• Study 3	14.5%	17.7%	22%
• Study 4	11.5%	14.8%	28%
Forecasting good weather	19%	22%	18%
Writing "thank you" on check	16%	18%	13%
Drawing a picture on check			
• Waiter drawing a smiley face	21%	18%	–
• Waitress drawing a smiley face	28%	33%	18%
• Bartender drawing a sun	19%	26%	37%
Using credit card insignia			
• Restaurant	16%	20%	25%
• Café	18%	22%	22%
Calling customer by name	14%	15%	10%
Giving customer candy			
• Study 1	15%	18%	18%
• Study 2	19%	23%	21%

Source: Lynn, M., "Seven Ways to Increase Server Tips" *Cornell Hotel and Restaurant Administration Quarterly*, June 1996, pp. 24-29.

* Dollar amounts are per person. With regard to suggestive selling, the tip is 15% of total check. DG = Dutch Guilders

For example, a "bricks" book retailer such as Borders would design the service system completely different from a "clicks" book retailer such as Amazon.com as shown in Table 5.3. These distinctions are discussed in more detail in the following section.

Facility location decisions for services are usually based around proximity to the customers. Companies like Starbucks and Mailboxes, Etc. want extensive customer coverage and locate near their key target markets, primarily lively residential or small business neighborhoods. On the other hand, back-office services such as Internet services, call-in centers, and processing centers should locate closer to key employee groups and other important resources such as telecommunications and transportation infrastructure.

Facility layout depends on the presence of the customer at the location. If the customer is not present in the service (back-office operations) then layout decisions are based on operational efficiency. But when the customer is physically present, the layout decisions revolve around how the surroundings affect the customers and employees. Mary Jo Bitner (1992) coined the term *servicescape* to refer to a service's physical surroundings and how they affect people in a retail setting. The layout is crucial to

TABLE 5.3: *Service Decision Factors for "Bricks" Versus "Clicks" Book Retailers*

Design Factor	"Bricks" Book Retailer	"Clicks" Book Retailer
Facility location	Multiple locations close to customers	Centralized location
Facility layout	Facility accommodates customer's needs and enhances shopping experience	Facility accommodates back-office tasks such as shipping, receiving, information systems management, and call-in center
Product design	Store design emphasizes book shopping experience with best-seller tables, cozy furnishings, and entertainment	Web site is designed to emphasize book shopping while facility is customer-free and oriented toward inventory and distribution
Scheduling	Workers are scheduled to meet peak customer demands on basis; lumpy schedules	Workers are scheduled to meet completion dates or daily requirements; flat schedules
Worker skills	People oriented with knowledge of books	Technology and task oriented
Quality control, measures, time standards	More difficult to measure and develop standards, oriented toward variable customer beliefs	Easy to measure Web site-related quality and time issues
Demand/capacity planning	Capacity must match peak demand on hourly basis	Capacity must match peak demand on daily or weekly basis
Industrialization level	Low substitution of technology for people	High substitution of technology for people
Standardization	Store look is generally standardized; customer interaction is customized by personnel	Customer Web page is customized, all else is standardized
Customer contact time	High	Low
Frontline personnel discretion	High employee discretion in their interaction with customers	Minimal employee discretion in interaction with customers (often scripted)
Sales opportunity	More opportunity for selling additional books and merchandise (coffee, pastries, music)	Less opportunity for selling additional merchandise
Customer participation	Mixed self-serve and assisted sales	Mostly self-serve

enhancing the customer experience (see Chapter 6 for extensive coverage of experience design) and to the service functionality. The layout in large grocery stores, like Safeway, and superstores, such as Wal-Mart, emphasizes strategic product placement and customer flows through their stores to maximize sales and convenience.

Product and process design covers both the tangible and intangible aspects of the service offering or package. For example, a restaurant's product design includes the physical environment, menu offerings, customer interaction level, music, and many other factors. A franchised fast-food service follows a well-defined product design that is ubiquitous for each location. The customer expects to find a standardized product at each McDonald's that includes a similar process design, such as the service transaction and short waiting time, in addition to the Quarter Pounder™.

Scheduling addresses how the workers are assigned to the service. When the customer is part of the service interaction, then employees are scheduled to meet

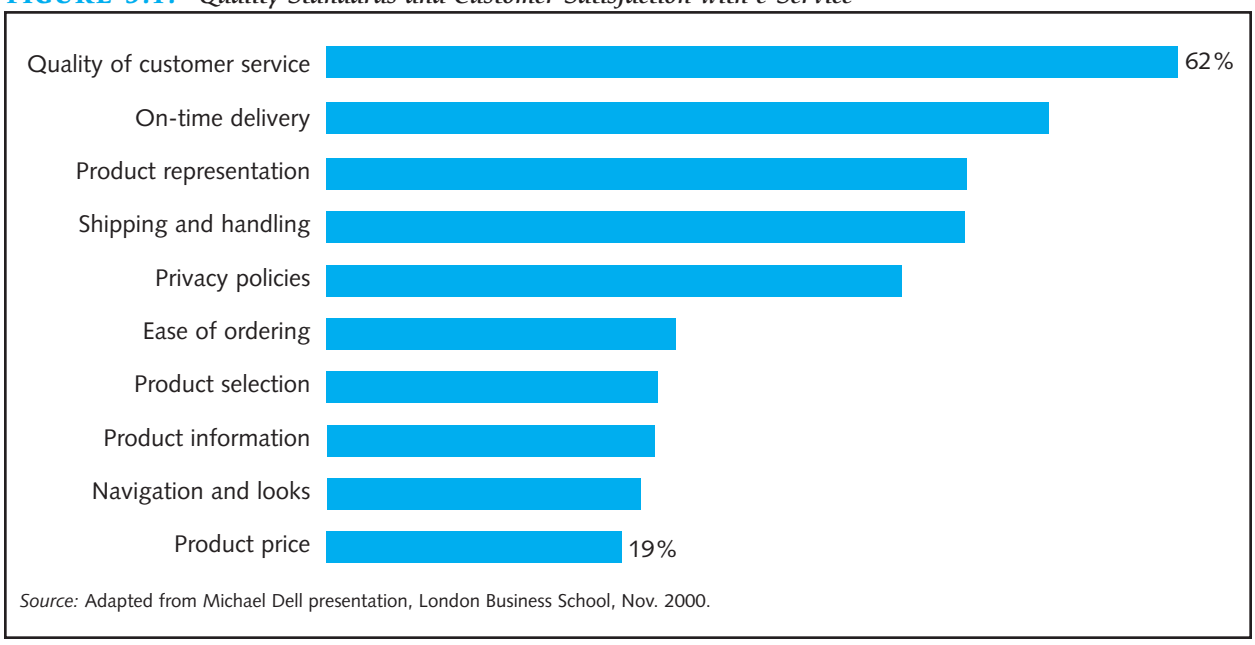
immediate demand generally creating a "lumpy" schedule for businesses facing variable demand. Customers who are not physically present, as with Internet services, can interact either automatically with technology or through chat, phone, and e-mail. Here, the employee schedule is level because the responses may not need to be immediate or demand can be spread across time zones and activities.

Quality control, measures, and time standards should focus on customers' needs and how well the service addresses those needs. For example, the significant quality measures for Internet retail services are shown in Figure 5.1. Customers' number one concern is quality of customer service followed closely by on-time delivery. Quality control systems for these businesses monitor customer interaction with employees to ensure that employees are friendly, accurate, and provide quick problem resolution. Each company establishes its own measures for "friendliness," such as appropriate greeting, closure, addressing customer by name, and so on. Time standards that apply to an e-service would be length of time for delivery, customer's time in phone queue, e-mail response time, length of time for order assembly, and problem resolution time.

Demand/capacity planning depends on the type of service and the immediacy of matching supply to demand. Many services, such as restaurants, hotels, and airlines, use reservation or yield management (see Chapter 12) to match their capacity to demand. Still others attempt to match employee capacity to customer demands to reduce queues using scheduling techniques (see Chapter 14). Other capacity issues include technology capacity, ability to handle unusual spikes in demand, seating capacity, ability to shift demand, and use of self-service.

Customer contact level refers to physical presence and length of time that a customer spends with a service provider. This interaction can happen in several ways. In a *direct contact* service, the customer is physically present and interacts with a service provider such as in a medical clinic or hairdresser. The customer is not physically present or interacting in real-time with an *indirect contact* service, such as e-mailing or live chat with a service. Finally, some services can be executed with *no contact* with the service provider, such as an ATM interaction.

FIGURE 5.1: *Quality Standards and Customer Satisfaction with e-Service*



Source: Adapted from Michael Dell presentation, London Business School, Nov. 2000.

Industrialization level refers to the substitution of technology for people. Today, all businesses make efforts to increase their industrialization level. Whether done through automated phone answering systems with simulated voice or through soft systems such as visual inventory reordering cards, the goal is to reduce the use of service employees and direct customer contact, the most costly and fallible side of a service encounter.

Front line personnel discretion denotes the flexibility of the service employee while interacting with a customer. For many customer service centers, the use of formalized dialog sequences or "scripting" limits the employee discretion. This practice encourages consistency and quality or promotes a certain marketing message or image. Highly personalized services such as boutique hotels and luxury product retail give the personnel high flexibility during their customer interaction to encourage customer loyalty and sales. For example, Joie de Vivre Hotel Chain has a dream-maker program. Here, the employee can create a customized welcome gift for VIP customers. In one example, an employee called the VIP's assistant to find out the guest's favorite snack foods and made a special welcome gift basket filled with these items.

Worker skills depend on the service strategy and concept, customer contact level, and industrialization level. Generally speaking, in high customer contact services with high-quality expectations, the workers require strong people skills. In low contact services, however, the workers require technology skills or dexterity and memory skills for back-office tasks such as check or package sorting by codes.

Sales opportunities coincide with high customer contact and employee discretion. When a customer directly interacts with an employee and the employee has a high level of discretion, the opportunity to close the sale or upsell increases. Good sales employees quickly determine customers' needs and solutions to appeal to and satisfy those needs. This phenomenon is particularly apparent with online retail shopping. Here two-thirds of all consumers abandon their electronic shopping carts. But, when companies implement live chat (the ability to type questions to a service representative and get real-time responses), their sales closures rise dramatically. Companies like Cameraworld.com went from 3% to 25% sales closure after implementing live chat.

Standardization of service offering is the level of uniformity provided in the service. Standardized services such as fast-food or hotel franchises reduce costs, provide the customer with a certain expectation or known commodity, and are easier for management to control the process and duplicate for growth. But, customers do like to feel that something special has been done just for them, so many services offer customization to appeal to these people. Increasingly, technology allows for mass customization so that the entire standardization/customization continuum can be covered by a provider appealing to a broad range of customers.

Customer participation refers to the substitution of consumer labor for provider labor. By shifting some of the service activities to the customer, the service provider can save money, increase efficiency, and place some of the responsibility for service quality and experience in the customer's hands. Customers can participate in small tasks such as bussing their own tables at Starbucks. Other companies ask the customers to completely self-serve, such as Smith and Noble, a window treatment provider that requires the customers to measure their own windows, order, and install the treatments themselves. The company will not take a verbal order but must see the dimensions in writing either through fax or online ordering. This requirement makes the customer responsible for the measuring and installation errors.

Service System Design and Innovation

Service system designers face unique challenges relative to product designers because the service customer buys a package of goods and services usually provided

in the same environment. This package consists of different features or attributes. First, a *supporting facility* generally must be in place before a service can be offered. For example, Texaco must have a site and building or leased space for the gas station. Second, *facilitating goods* such as a product or other tangible features are part of the service. In the gas station example, facilitating goods would include gas, groceries, and fast food. Third, *sensual* and *psychological benefits* are associated with the services. These benefits could include sights, smells, and sounds or feelings of status, privacy, or security. The gas station should be designed for cleanliness and comforting smells as well as creating a feeling of security for the road-weary traveler.

Additionally, today's services may actually bundle several services together in one supporting facility. Therefore, it is important to differentiate between the *core* and *ancillary* services. For example, contemporary gas stations offer gas as their core service and ancillary services such as a convenience store facility, an ATM, and perhaps several fast-food vendors such as KFC, Subway Sandwiches, and Taco Bell under one roof. It is important for service designers to consider the right mix of services that complement the core service and address the target market's needs and the core service strategy. In many businesses, the ancillary services become major sources of revenue or key attributes in the customer's choice of a particular core service over competitors. Las Vegas casinos aggressively pursued celebrity chef restaurants such as Emeril's and Wolfgang Puck's to fill their retail eating space. Many customers now choose their gaming location based on the choice of restaurants in the facility.

How does the service system design contribute to innovative new services? Most recently, the emergence of the Internet as a significant process technology enables delivery of many new service products, both incremental and radical innovations. The interaction of design factors of customer contact, industrialization, and standardization play an important role in new service innovations (see Figure 5.2). In face-to-face delivery systems, new technologies improve the service standardization or consistency for incremental innovations. For example, handheld wireless order pads in London's Wagamama Restaurants are an incremental innovation that helps the restaurants reduce order time and errors along with improved inventory management. Internet technologies can assist services wishing to increase their industrialization level and move completely away from face-to-face delivery to technology-based self-service. Typical examples of this type of technology-driven service innovation are online book and CD sales, travel agencies, and many other retail businesses. Finally, we see that radical service innovations shift the paradigm from face-to-face customer interaction and low standardization to self-service and high standardization, usually through information and computer-based technologies.

FIGURE 5.2: *Industrialization and Standardization Effects on Service Innovations*

	Standardization Level	
Industrialization Level	***Low***	***High***
Low *(Face-to-Face Delivery)*	*Current Service* *Shop at store* *Take computer to repair center*	*Incremental Service Innovation* *Trunk shows at home* *"House call" computer repair services*
High *(Technology-based Self-Serve)*	*Technology-Driven Service Innovation* *Body-scanning technology* *Computer Diagnostics via phone menus*	*Radical Service Innovation* *Shop on-line for made-to-order clothing*

Service System Design Tools

New service designers rely on several tools to develop and analyze their concepts. All of these tools recognize the importance of the customer in the system. The first tool, service blueprinting, maps the customer's processes and examines interactions in different steps in the service encounter. The second tool, customer utility models, generates the attributes that are important to a customer and then analyzes the potential customer satisfaction level, revenues, and profits from a new service design in a competitive market.

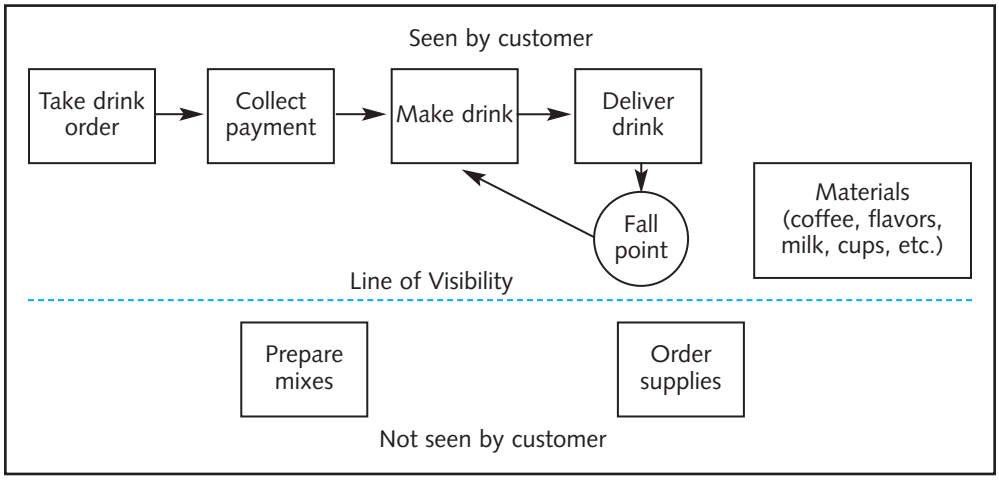
Service Blueprinting

Service blueprinting is a design tool based on the process flow diagram (discussed in Chapter 9, Analyzing Processes). Not only is the diagram useful for analyzing and improving existing processes, but, it creates the map of a new process. Several key points differentiate the blueprint from a standard process flow diagram as illustrated in Figure 5.3, a blueprint for an Espresso & Coffee Shop, similar to Starbucks.

First, a clear delineation separates the front office or high-contact area from the back office or low customer contact area. A "line of visibility" divides these two functional areas and the processes occurring in each. When developing a new service, designers must think about who will perform that task, what processes will happen in front of the customer and what is behind the scenes, when the process occurs and in what sequence, and why the process is placed in that sequence and visibility area. For example, espresso shops could pregrind espresso beans behind the scene, but the act of grinding them within the customer's view shows the customer the freshness of the drink and creates a certain sensory experience.

Second, designers can determine standard or maximum execution times, materials, and the exact details of a particular step. In the example shop, the designer can dictate the exact sequence with which the employee takes the customer's money and creates change during the purchase transaction. The diagram addresses the materials required for each process and where the purchase and ordering responsibility occurs. The espresso shop uses coffee, flavoring, cups, and lids as the materials in its process. The shop may sell other merchandise such as mugs, coffee-making machines, books, and CDs, but these items belong to another design element, not the drink-making design.

FIGURE 5.3: *Service Blueprint for Espresso and Coffee Shop*



Third, designers can examine potential failure points and come up with strategies for preventing or recovering from failure. The mistake-proofing strategy, or *poka-yoke* (which is Japanese for avoiding mistakes), can be an integral part of the design. Poka-yokes are generally warning, physical, or visual contact methods. They cover the task to be done, the customer treatment, and the tangible or environmental features of the service. (See Chapter 10 for more on poka-yokes.) The espresso shop example shows a fail point at drink delivery. Here the customer may receive a drink that does not match what was ordered. Poka-yoke design elements to prevent this failure include the following: The employee marks the drink specifications on the paper cup as the customer orders, the employee then repeats back what the customer ordered (i.e., "decaf, skim milk, large latte"), the customer confirms or corrects the order at this point, and when the drink is finished the employee again repeats the order just completed.

Customer Utility Models

Commercial success often depends on a favorable market response to a new service configuration. In turn, that response depends on the customer's perceived utility or benefit provided by the service's price and nonprice attributes and that of competing brands. Tools such as conjoint analysis (CJA) are now widely used to assess the perceived utility of new service design and to predict the market's sensitivity to changes in the levels of key price and nonprice attributes.

One of the more tantalizing promises of consumer utility measurement is the ability to optimize the design of a service (i.e., specify a level for each price and nonprice attribute). Typical objectives include maximizing customers' aggregate utility, market share, expected customer satisfaction, or expected contribution to profits. Drivers of service customer satisfaction and utility are often linked to interactions with service delivery personnel. The importance of these interactions on customer satisfaction suggests that certain process attributes, such as employee recruiting, training, and retention efforts, should be explicitly modeled in any service design decision.

Customers develop service attribute expectations from marketing messages and previous experience. To design a new service, managers must determine which attributes are important to customers, whether the service is capable of delivering the attributes according to expectation, the cost of taking an attribute to a different level, and the customer's subsequent perception of the delivered service or satisfaction.

Satisfaction with the quality of a service affects customer loyalty and repurchase intent, and thus the utility of the service for customers. Service quality can be determined along five principal dimensions. The first four address the service process: reliability, responsiveness, assurance, and empathy. The remaining dimension covers the goods content or tangible aspect of the service. These dimensions can be mapped to specific attributes of the service design (Easton and Pullman, 2001). In general, increasing the intensity of a service quality attribute affects one or more of the following service delivery expenses: (1) direct labor expenses, (2) expenses for consumables, or tangibles, (3) hiring costs, and (4) training costs. In Table 5.4, we identify specific service attributes likely to influence perceptions for each dimension of service quality and suggest mechanisms for varying the intensity of these attributes.

Options for improving perceived service *reliability* often result in increased labor expenses and training costs. For example, the perceived reliability may depend on whether the service begins and ends at the expected times. To improve reliability, designers might choose to increase the length of appointment blocks, train and equip service workers to better meet temporal service performance expectations, or simply add more service capacity during periods of high utilization.

TABLE 5.4: *Nonprice Service Attributes and Cost Implications*

Service Quality Attribute	Examples	Potential Actions to Intensify Attribute	Increased Operating Cost Implications
Reliability	• Service begins on time • Accurate records and billing • Predictable treatment	• Decrease service rates • Increase preventative maintenance • Increase training in standard operating procedures • Increase service level	• Labor schedule costs: labor required/period • Training costs: function of number of employees and training intensity
Responsiveness	• Prompt service • Availability (hours of operation) • Willingness to help customers • Ability to compensate for service breakdowns	• Reduce waiting time • Increase hours of operations • Increase training • Increase selective hiring • Increase gratis consumables and refunds • Improve explicit benefits for guarantees of service quality	• Labor schedule costs: labor required/period, shift premiums • Training costs: function of number of employees and intensity • Hiring costs: function of number of screened candidates • Consumable cost: function of number of service failures, type of failure, and effective recovery cost
Assurance	• Employee knowledge, courtesy, and confidence • Employee competence	• Increase training • Increase selective hiring • Increase incentives and wage rate	• Training costs: function of number of employees and wages • Hiring costs: function of number of screened candidates • Labor schedule costs: higher wage rates
Empathy	• Provision of caring attention to customers • Employee approachability and sensitivity to customers' needs	• Increase training • Increase selective hiring • Increase incentives and wage rate	• Training costs: function of number of employees and wages • Hiring costs: function of number of screened candidates • Labor schedule costs: higher wage rates
Tangibles	Product characteristics • Specifications • Packaging Appearance of: • Physical facilities • Equipment • Personnel • Communication materials	• Improve product and package • Increase preventative maintenance • Increase training • Improved consumables	• Overall product cost • Labor schedule costs: higher wage rates and number of shifts • Training costs: function of number of employees • Consumable costs: quality of facility, product, and employee uniforms

Source: Easton and Pullman (2001).

Perceptions of *responsiveness* may be enhanced by reducing queue times. Because service demand can vary significantly from hour to hour and service outputs can rarely be stored for later use, it is usually necessary to adjust service capacity to match temporal demand. Service capacity is adjusted through employee scheduling decisions after target response times and the predicted service demands for each period are converted to employee requirements. Due to hours-of-work constraints, the number of workers scheduled for duty at a particular time often exceeds the prescribed capacity level. Thus, the incremental cost of a modest improvement in responsiveness may range upwards from zero (when sufficient slack already exists) to the combined wages for several additional employees.

Perceptions of *empathy* and *assurance* are influenced by the ability of service providers to convey knowledge, courtesy, impressions of caring, and approachability during each service encounter. To increase the intensity of these attributes, designers may invest in more sophisticated screening methods for hiring decisions, train and empower employees to interact effectively with anxious or potentially angry customers, and increase the amount of time spent with each customer. Each activity affects labor-related expenses such as recruiting, hiring, training, and labor schedule costs.

Enhancing the *tangible* attributes of a service generally increases costs for consumables and, in some cases, capital requirements and maintenance expenses. In the hospitality industry, the service good content relates to food, hotel rooms, and other amenities. Generally, increased consumable expenses such as packaging, ingredients, or interior design elements can improve perceptions of the tangible attributes. Similarly, these improvements affect labor costs. For example, to improve customer perceptions of bathroom cleanliness a national hotel chain considered several ideas to improve perceptions. It could instruct its staff to spend more time on each bathroom, assign additional personnel to clean bathrooms, or increase the amount of training on how to clean a bathroom. Compared with the status quo, each alternative increased recurring training costs and labor expenses.

In order to design services in a competitive market, designers need to determine (1) important service attributes along with customer's preference model for them, (2) the attributes that are appropriate for standardization for all segments or customization for a specific segment, (3) the practicality and economic feasibility of different attributes and attribute levels, and (4) the market share or profit implications of their chosen design. The overall utility model is shown in Figure 5.4.

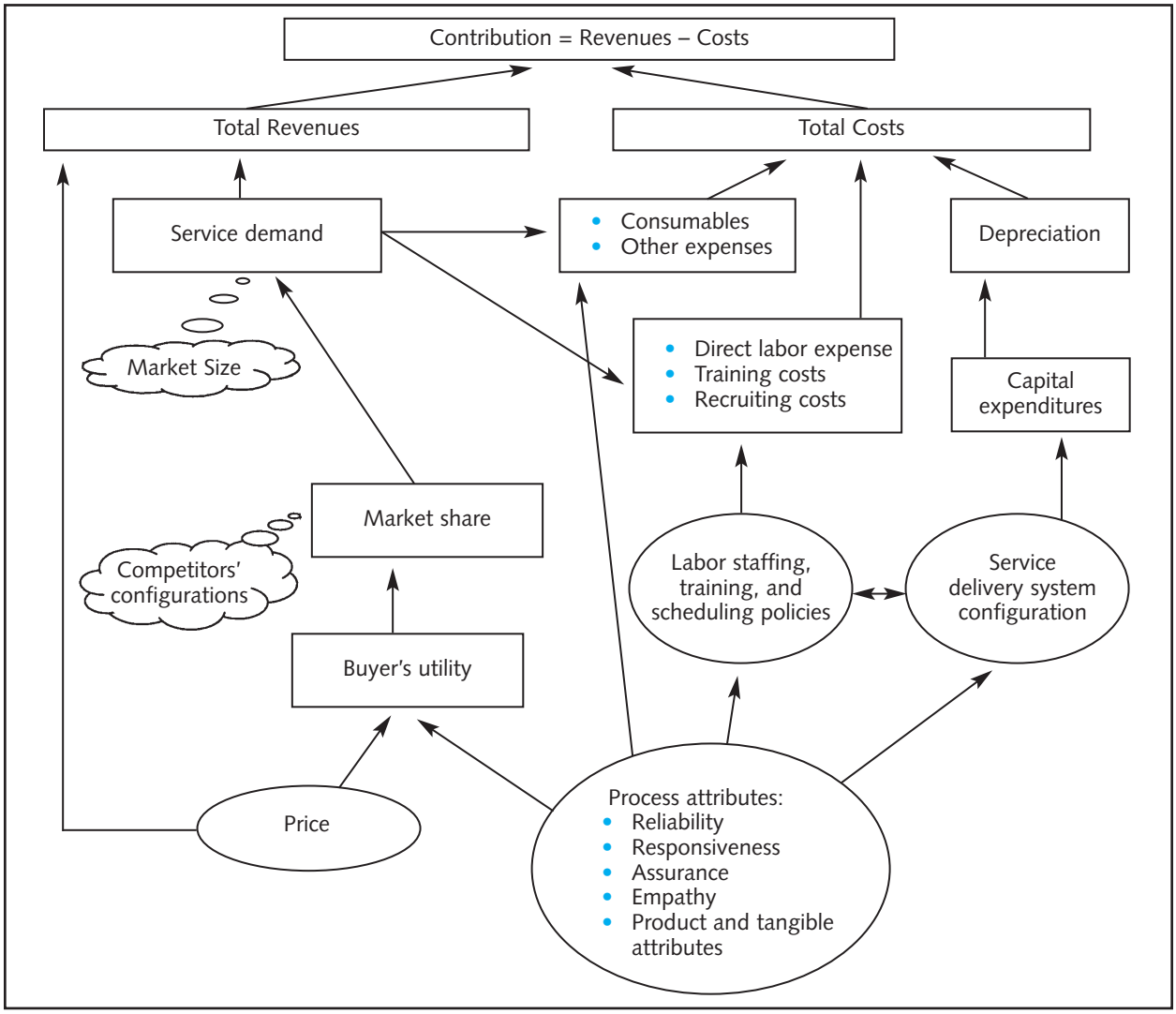
To evaluate a new service using the utility model, conjoint analysis (CJA) and discrete choice analysis (DCA) are used to model customer utility (preferences) in response to experimentally designed profiles of service attributes. Recent studies demonstrate that market utility models developed from carefully conducted DCA experiments can be used to effectively predict market share for various types of products and services.

Discrete choice experiments involve careful design of service profiles (a specific service) and choice sets (a number of services) in which two or more service alternatives are offered to decision makers who are then asked to evaluate the options and choose one (or none). Based on the experimental design, the decision makers' choices (dependent variable) are a function of the attributes of each alternative, personal characteristics of the respondents, and unobserved effects captured by a random component (for example, unobserved heterogeneity or omitted factors).

For example, to design a new restaurant in an international airport terminal, the following steps are required:

1. Identification of important attributes
2. Specification of attribute levels

FIGURE 5.4: *Utility-Based Service Design Process*



3. Experimental design
4. Presentation of alternatives to respondents
5. Estimation of choice model

Table 5.5 highlights the appropriate attributes and the potential level of each attribute for the restaurant. In this case, restaurant brand name, menu variety, food price, wait time to order and to serve, menu languages, and pictorial displays of menu items are the important attributes. Because each attribute can be assessed on several potential levels such as price range or waiting times, respondents are provided with a number of choice profiles (16 to 32 profiles) similar to Table 5.6. From their responses, a choice model is built for customer segments or an aggregate customer group. This choice model can be used to predict sample customers' utility, market share, and potential profit for a new service design. Verma, Thompson, and Louviere (1999) provide a guideline for designing and conducting DCA studies for services.

TABLE 5.5: *Attributes and Levels for International Terminal Restaurant Design*

Attributes and Levels	Restaurant #1	Restaurant #2	Restaurant #3	Restaurant #4
Brand name				
Level 1	Local chain	Local chain	Generic food items	Local chain
Level 2	McDonald's	Pizza Hut/Dominos	La Prefreda/Goya	Subway/Boston Market
Variety				
Level 1	Burgers, fries, ice cream	Pizza	Hot dog, fries, nachos + Burritos, tacos	Sandwich, soup, ice cream + Udan noodle soup, salads
Level 2 (add to Level 1 items)	+ Chicken nuggets and salads	+ Lasagna, pasta	+ Tamales, enchiladas	+ Sushi, simple Asian dishes
Level 3 (add to Level 1 & 2 items)	+ Special burgers and sandwiches	+ Salads, soups		
Wait-before-ordering				
Level 1	0–2 mins	0–2 mins	0–2 mins	0–2 mins
Level 2	3–4 mins	3–4 mins	3–4 mins	3–4 mins
Level 3	5–6 mins	5–6 mins	5–6 mins	5–6 mins
Service time				
Level 1	0–2 mins	0–2 mins	0–2 mins	0–2 mins
Level 2	3–4 mins	3–4 mins	3–4 mins	3–4 mins
Level 3	5–6 mins	5–6 mins	5–6 mins	5–6 mins
Menu language				
Level 1	English	English	English	English
Level 2	+ Spanish	+ Spanish	+ Spanish	+ Spanish
Level 3	+ Japanese	+ Japanese	+ Japanese	+ Japanese
Picture display				
Level 1	No	No	No	No
Level 2	Yes	Yes	Yes	Yes
Price: meal + drinks				
Level 1	$ 4	$ 4	$ 4	$ 4
Level 2	$ 7	$ 7	$ 7	$ 7
Level 3	$10	$10	$10	$10

TABLE 5.6: *Restaurant Sample Choice Set*

CHOICE SET #11	Restaurant #1	Restaurant #2	Restaurant #3	Restaurant #4
Brand name	McDonald's	Local restaurant	La Prefreda/Goya Products	Subway/Boston Market
Variety	Burger, fries, ice cream	Pizza, lasagna, pasta, salads, and soups	Hot dogs, fries, nachos, burritos, tacos, tamales, and enchiladas	Sandwich, soup, ice cream, Udan noodle soup, and salads
Wait time (before ordering)	5–6 mins	0–2 mins	3–4 mins	0–2 mins
Service time	0–2 mins	3–4 mins	5–6 mins	3–4 mins
Menu language	English	English, Spanish, and Japanese	English and Spanish	English and Spanish
Picture display	Yes	No	No	No
Price (meal + drinks)	$4	$4	$10	$7
I would purchase food from				

Source: Pullman, Verma, and Goodale (2001)

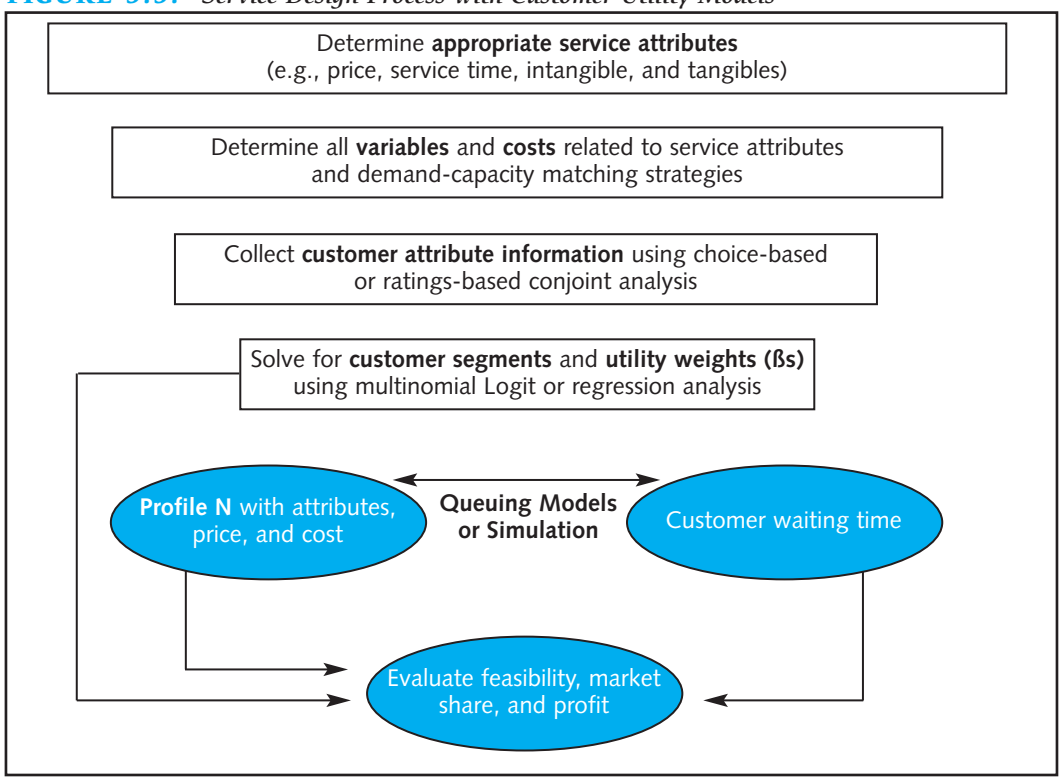
SERVICE OPERATIONS MANAGEMENT PRACTICES

New Service Design for Snowbird Ski Resort

Snowbird Ski Resort competes against six other contenders in a regional market. Most western resorts face varying constraints on capacity due to environmental regulations that limit their acreage and parking areas, surrounding public lands, natural rugged terrain, and snow-making capability. On the other hand, to be a contender in this market, a resort must continually improve the facility by installing chair lifts, adding trails, and keeping up with the latest snow-making technology. Half of the other competitive resorts made investments in facility improvements during the last five years. Snowbird observed a decline in ticket sales, which management attributed to their competitors' improvements. Therefore, resort management, considered service design changes and wanted to determine the most profitable option.

Following the sequence outlined in Figure 5.5, the design team held focus groups to determine the most important attributes for a ski resort. They then developed a choice model questionnaire with these attributes and two to three different levels for each attribute with 16 choice sets. A sample choice set is

FIGURE 5.5: *Service Design Process with Customer Utility Models*



SERVICE OPERATIONS MANAGEMENT PRACTICES

shown in Figure 5.6. The questionnaires were completed by 276 regional skiers and the resulting model (Multinomial Logit) is shown in Table 5.7. For this customer group, the beta coefficients indicate that skiers want decreased prices and waits in line but increased lift capacity to high-speed quads, more facilities, and more beginner and intermediate level runs.

The design team looked at several options to address these preferences: lower ticket prices, off-peak pricing to shift demand, adding a number of new lifts and runs, adding new terrain, and installing real-time queue information signage. Each of these options carried some level of fixed and variable cost. Finally, through a complete resort simulation with many different scenarios, the design team determined the various relationships between design changes, waiting time, and overall customer preference or market share for each scenario. Using this information, the team found that by installing two new lifts and the queue information signage, the resort could increase its market share by 3%, adding 80,000 skier-day sales (tickets) per year and increasing profits by 20% (including the new investments). (For more information on this project see Pullman and Moore, 1999.)

FIGURE 5.6: *Choice Set for Ski Resort Design*

Ski Area A	Features	Ski Area B
Rugged terrain, sparsely forested, dramatic rock peaks	**Physical Setting**	Rugged terrain, sparsely forested, and dramatic rock peaks
40 minutes drive from home	**Distance**	40 minutes drive from home
70 inches	**Snow Base**	70 inches
12 inches new powder	**New Snow**	12 inches new powder
3,250 feet	**Vertical Drop**	3,250 feet
Groomed trails with glades and bowls	**Type of Runs**	Groomed trails only
35 ski runs	**Size of Area**	35 ski runs
25% Advanced, 50% Intermediate, 25% Beginner	**Challenge**	25% Advanced, 50% Intermediate, 25% Beginner
Ski shops, restaurants, nightlife, boutiques, lodging	**Facilities**	Ski shops, restaurants, nightlife, boutiques, lodging
$50 per day	**Ticket Price**	$20 per day
30 minutes at peak time	**Lift Line Wait**	30 minutes at peak time
Mostly triples and quads	**Type of Lifts**	Mostly triples and quads
Not allowed	**Snowboards**	Not allowed

Suppose these two ski areas described were the only ones available for your next ski outing. Please check (✓) one box below to indicate what you would most likely do:

☐	I would choose Ski Area A.
☐	I would choose Ski Area B.
☐	I would do something else and not ski.

Source: Pullman and Moore (1999).

SERVICE OPERATIONS MANAGEMENT PRACTICES

TABLE 5.7: *Customer Utility Model for Ski Resort Design*

Variable	Beta Coefficient
Intercept	0.2435
Drive time	–0.1414
Snow base	0.0896
Lift line wait	–0.1909
New snow	0.0308
Vertical drop	0.0086
Number runs	0.0068
Price	–0.0697
Difficulty level 1	0.0463
Difficulty level 2	0.0876
Difficulty level 3	–0.0464
Setting level 1	0.2080
Setting level 2	0.0834
Setting level 3	–0.0754
Terrain level 1	0.0167
Terrain level 2	0.0238
Terrain level 3	0.0433
Facility level 1	–0.0492
Facility level 2	0.0835
Facility level 3	0.0784
Lift types level 1	0.0258
Lift types level 2	0.0279
Lift types level 3	0.0601
Allow snowboarding	–0.0279

Summary

New service design poses many challenges for firms due to the intangible nature of service encounters, inability to prototype and test new concepts, and a propensity to use ad hoc methods. Innovations come through both incremental and radical new services. The two approaches may require different design processes but generally address the same significant factors such as level of customer contact and industrialization. We introduced several design tools that assist designers in evaluating service concepts for improved efficiency, customer satisfaction, quality, market share, and profitability.

Review Questions

1. What is the difference between incremental and radical new service design?
2. Where should management allocate effort and resources in incremental and radical new service design processes?
3. How can service blueprinting be used in new service design?

4. What are failure points in a coffee shop? What types of poka-yokes can one use to eliminate these failures?
5. How are customer utility models used in service design? How do they differ from other approaches such as service blueprinting?

Selected Bibliography

Bitner, M. 1992. Servicescapes: The Impact of Physical Surroundings on Customers and Employees, *Journal of Marketing,* 56 (April), 57–71.

Easton, F., and M. Pullman. 2001. Optimizing Service Attributes: The Seller's Utility Problem, *Decision Science,* 32(2), 1–25.

Gadrey, J., Gallouj, F., and O. Weinstein. 1995. New Modes of Innovation: How Services Benefit Industry, *International Journal of Service Industry Management,* 6(3), 4–16.

Griffin, A. 1997. PDMA Research on New Product Development Practices: Updating Trends and Benchmarking Best Practices, *Journal of Product Innovation Management,* 14, 429–458.

Johnson, S., Menor, L., Roth, A., and R. Chase. 2000. A Critical Evaluation of the New Service Development Process: Integrating Service Innovation and Service Design. In J. Fitzsimmons and M. Fitzsimmons (Eds.), *New Service Development.* Sage Publications, Thousand Oaks, CA.

Kimes, S., and F. Young. 1997. The Shuttle by United, *Interfaces,* 27(3), 1–13.

Lovelock, C. 1984. Developing and Implementing New Services. In W. George and C. Marshall (Eds.), *Developing New Services.* American Marketing Services, Chicago.

Lynn, M. 1996. Seven Ways to Increase Server Tips, *Cornell Hotel and Restaurant Administration Quarterly* (June), 24–29.

Pullman, M., and W. Moore. 1999. Optimal Service Design: Integrating Marketing and Operations Elements for Capacity Decisions, *International Journal of Service Industry Management,* 10(2), 239–260.

Pullman, M., Verma, R., and J. Goodale. 2001. Service Design and Operations Strategy Formulation in Multicultural Markets, *Journal of Operations Management,* 19(2), 239–254.

Verma, R., Thompson, G., and J. Louviere. 1999. Configuring Service Operations in Accordance with Customer Needs and Preferences, *Journal of Service Research,* 1(3), 262–274.

CASE STUDY

New Service Design Experiments at Bank of America

Companies that develop new products have many options available for developing and testing new ideas. Products like cars or food can be put through a series of lab or field-based tests, evaluated by sample populations, and refined before a major market rollout. On the other hand, services require real customers to interact with the concept at the point of purchase for evaluation and refinement. Putting out a "prototype" service is riskier on many levels. A new concept that does not work could harm customer satisfaction and perceptions of the brand. Service prototype experiments are difficult to monitor and evaluate due to variation between or among customers and employees; many other factors operating in a real environment can obscure the variable of interest. Over the last few years, Bank of America has taken on this new service development challenge and developed a series of formal experiments to create new retail banking services by turning a number of their branch offices into "laboratories."

Bank of America Experiment Designs

Bank of America's Innovation and Development (I & D) Team reconfigured 20 of their 200 Atlanta bank branches into three alternative models; *express centers*, efficient, modernistic buildings where consumers could quickly perform routing transactions; *financial centers*, spacious, relaxed outlets where customers would have access to trained staff and advanced technologies for stock trading and portfolio management; and *traditional centers*, familiar branches that provide conventional banking services supported by new technologies and redesigned processes.

After generating a list of more than 200 potential experiments, the I & D team categorized each idea according to priority based on projected impact on customers, alignment with bank strategy and goals, and funding requirements. To plan and execute each experiment quickly, the bank created a prototype branch to rehearse steps of an experimental process and work out problems before going live with real customers. The team required that every experiment minimize the effects of noise (those variables not being tested), have a high likelihood of providing attractive returns, and run for 90 days before adjusting or discontinuing. The performance data for each experiment (at test locations and control branches) were analyzed to determine whether the experiment had enhanced customer satisfaction, revenue generation, productivity, or any other relevant measure of performance. In addition, cost-benefit analysis was required to ensure that the performance gain outweighed the expense of the new process or technology.

Example of a Waiting Time Experiment

For one of their first experiments, the I & D team chose to focus on waiting processes. From initial survey results, they found that customers who waited in line for two

CASE STUDY

minutes felt like it was a two minute wait, but if they waited for five minutes, they felt like it was a ten minute wait. The team felt that if people are entertained in line by offering television monitors above the rows of tellers in the lobby then the customer's perception of wait time could be reduced and satisfaction improved.

The team installed monitors set to CNN in one traditional center; another traditional center with a similar clientele was used as a control branch. The team then carefully measured actual versus perceived waiting time at the two branches. The degree of overestimation of wait times dropped from 32% to 15% at the test branch, while the control branch actually saw an increase in overestimates wait times, from 15% to 26%. In addition, the team had to justify spending $22,000 to upgrade a branch. From statistical analysis of the project and prior studies on their customer-satisfaction index, the group estimated that the reduction in perceived waiting time would translate into a 5.9% increase in overall banking-center customer satisfaction (or about $84,000 increase in annual revenue for a branch with a 10,000 household customer base.) Thus, any branch with more than a few thousand households in its customer base could recoup the up-front cost in less than one year. After the success of the initial experiment, the team launched a second phase to evaluate the impact of more varied television programming, different sound levels, and advertising.

Challenges

Using a live setting for new service experiments is not without its challenges. Customers can get confused by unfamiliar processes. Employee time is taken up with many more meetings and training sessions. Employee routines are disrupted by ongoing experiments and often their incentive programs such as sales bonuses can be affected by participating in "experimental roles" rather than their selling roles. At Bank of America, customers often loved a new "experimental" service, thus branch managers at these locations wanted the service to be continued regardless of the financial implications. These are challenges that any service can expect to encounter when using live setting experiments. But, as Bank of America's efforts suggest, the challenges can be met and the bank achieved important current and future benefits by applying a systematic approach.

Source: From Thomke, Stefan (April, 2003). R&D Comes to Services: Bank of America's Pathbreaking Experiments, *Harvard Business Review*.