

# **Service Management Concepts: Implications for Hospitality Management**

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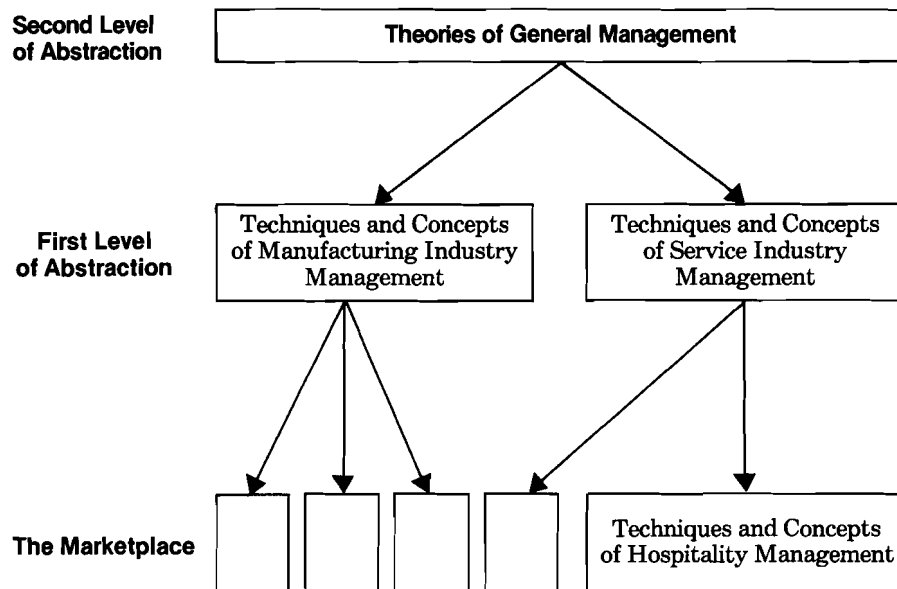
*The study and application of hospitality management has progressed on its own for many years; however, managers are not immune to the knowledge gained from study of other service industries. The author synthesizes what is happening in the area of service management, looks at its relevance to hospitality management, and identifies a few important implications of service management for hospitality managers.*

With the burgeoning of service industries and the need to adopt distinctive service orientations, there has been an accompanying demand for more appropriate management concepts, approaches, and techniques. While much of what we already know about effective management applies to service industries, some of the traditional concepts of management are inadequate in solving the problems faced by service businesses.

If a body of knowledge to be known as "service management" already exists, or is being developed, where does it fit relative to hospitality management? One way to answer the question is shown in Figure 1. The highest level of abstraction, theories of general management, constitutes a body of knowledge with general applicability wherever there is a business. Unfortunately, at that level of abstraction the transition from concept or theory to managerial application is often arduous. As the level of abstraction reduces, the range of application narrows, but the transition to use is easier. Thus at the lowest level we expect the techniques and concepts that have been developed in the area of hospitality management to have direct and immediate application to the industry but little capacity for generalization.

Until recently, management concepts and techniques at the first level of abstraction only existed and were generalizable for a vast array of manufacturing industries. Service industries, including hospitality businesses, borrowed from this body of knowledge, but the resulting "fit" has often been judged to be poor. With the growing importance of service industries, a need for a new body of knowledge is beginning to fill the void for a first level of abstraction for service industries, and as an important part of the service sector, hospitality businesses are bound to benefit.

**Figure 1**  
**A Context for Service Management**



**Source:** Adapted from John Bateson, et. al., *Testing a Conceptual Framework for Consumer Service Marketing*.

There are four criteria used to judge service management:

- the perceived body of common problems at the management level
- the real structural difference between services and goods
- the conceptualization of the management decision process
- the link between the common problems, structural differences and decision processes<sup>1</sup>

#### **Common Problems Exist at Management Level**

Service businesses are said to suffer from low productivity or output of service workers. This often results in a faster rate of price increases in comparison to goods. However, introduction of a “production line” approach, increased computerization, and use of new technological advances is serving to mitigate this problem. In a classic study of four service industries in France—distribution, banking, hotel and transportation—a more specific set of common problems has been identified:

### **Problems for the organization**

- lack of inventories to balance supply and demand (services can't be stored)
- no patent protection
- complex employee/client interface
- physical setting and environment effect quality of service but are difficult to control
- growth of firm requires development of its own distribution network
- innovation is difficult because it implies the need for client education to change behavior

### **Problems for the client**

- client must have considerable confidence in the firm and its ability to deliver the service
- a "mental image" of the service is difficult to formulate
- reduction of perceived risk in buying the service necessitates word of mouth or personal influence
- there is a tendency to become emotionally involved with a service firm when consuming the service<sup>2</sup>

These and other concerns such as the difficulty in setting prices or the difficulty in centralizing production have prompted many questions. Can service businesses become less people-intensive (more industrialized) while maintaining "personalization" and/or improving service quality? Can positive word-of-mouth be stimulated? How should customers be managed in order to even out demand? What are the best methods for communicating a clear image of the service? Clearly hospitality businesses share many of these problems with other service businesses.

### **Structural Differences Can Be Found**

Most of the previously-noted problems can be traced back to the differences that exist between services and goods. A review of the literature on the unique characteristics of services suggests that the key structural difference hinges on the intangibility of services.<sup>3</sup> That is, services can't be touched or easily understood; they are acts or performances. Service is an outcome between a physical environment and/or facilitating goods, the service personnel, and the customer. Therefore, there is more or less a simultaneous production/consumption of the service. This results in an inability to inventory, the necessity to deal with or sell directly to the customer, the need for multi-site locations close to the customer, and so on. It is this shared characteristic of intangibility that provides hospitality businesses with an identifiable link to other service businesses.

It should be noted, however, that there are significant differences among services businesses with regard to the intensity or importance

of intangibility. Hospitality business have important tangible attributes; in fact, food goes through a manufacturing process.

Lovelock suggests, therefore, that service businesses be distinguished from one another.<sup>4</sup> His categorization is based on marketing characteristics consisting of five attributes:

- the nature of the service encountered
- the degree of customization and judgment on the part of the service provider
- the nature of demand and supply for the service
- the manner in which the service is delivered

### **Models Are Developed for the Management Decision Process**

Over the past few years a variety of system models have been developed to explain the service process, that is, how the service is designed, produced, delivered, and consumed. Development of these models has grown out of different approaches to the question: "What is service management?" At the Harvard Business School, for example, Sasser, Olsen, and Wyckoff attacked the problem from the point-of-view of manufacturing strategy,<sup>5</sup> while Eiglier and Langeard at the Universite de Droit approached it from the perspective of marketing.<sup>6</sup> More recent conceptualizations have been oriented toward an operations research focus,<sup>7</sup> or a strategic, organizational, and management leadership focus.<sup>8</sup> Each of these models is depicted in Appendices A-E. There is sufficient similarity among them that allows us to identify and characterize their basic decision elements: the customer/client, the service concept, the service delivery system, service levels, and the service provider.

**The customer/client:** In asking the question: "How shall we approach the management of service?" Albrecht and Zemke note the central importance of the customer: "This service triangle, as we call it (see Appendix D), represents the three elements of service strategy, people, and systems as more or less revolving around the customer in a creative interplay."<sup>9</sup> The centrality of the customer is common to each of the models. The customer is identified as the key to defining the nature of the service and to determining how it is delivered. As such it is crucial for service management to

- identify the particular types of customer for which the service system is designed
- have a clear understanding of customers' expectations and perceptions so that the service concept can be well defined, communicated, and produced
- understand and know how to deal with the customer as a part of and/or participant (physically, intellectually, or emotionally) in the service delivery system

**The service concept:** The intangible nature of services and the presence of the consumer in the process requires development of a total service experience. For this reason services are often identified as packages consisting of four attributes:

- the physical items or facilitating goods, e.g., food, utensils
- the supporting facility, e.g., the hotel, a dining room
- the sensual benefits or explicit services, e.g., taste, aroma, social and structural atmospheres
- the psychological benefits or implicit services, e.g., comfort, status, reassurance

In other words, it is recognized that each service requires the use or presence of equipment, physical facilities, or hardware. The intangible services can be realized through interaction with contact personnel, the supporting mechanisms, and even other clientele.

Richard Normann differentiates between core services, the big benefits the customer is looking for, and peripheral services, the little things, or added bonuses that go along with the big benefits.<sup>10</sup> Similarly, Albrecht and Zemke differentiate between the primary service package and the secondary service package:

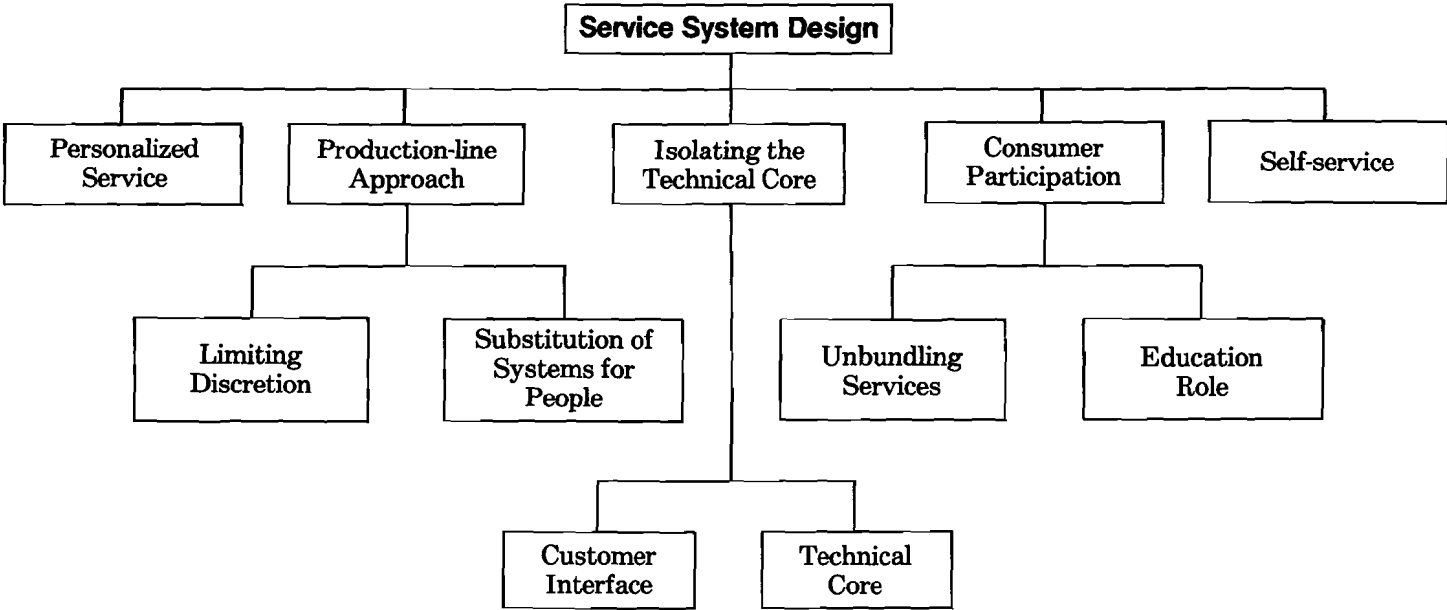
- **Primary service package:** The center piece of your service offering. It is your basic reason for being in business.... It needs to reflect the overriding logic of your service strategy and needs to offer a natural, compatible set of goods, services, and experiences that go together in the customer's mind to form an impression of high value.
- **Secondary service package:** To support, complement, and add value to your primary service package. The secondary package should not be a hodge podge of 'extras' thrown in with no forethought. All of these secondary service features should provide 'leverage,' that is, help build up the value of the total package in the customer's eyes.<sup>11</sup>

In a highly competitive situation, there is a synergistic relationship between the primary and secondary service packages that can lead to creative and effective approaches to the design of the service.

**Service delivery system:** Sasser, et. al., describe the service delivery system as a process that creates the service and delivers it simultaneously to the customer, i.e., the customer is actively involved in the process.<sup>12</sup> Design of the delivery system, however, is contingent upon the definition of the service package. Examples of approaches to service system design are depicted in Figures 2 and 3 and range from personalized service to self-service. It has been noted that the pressures for control and lower costs tend to force many service businesses to decrease the degree of interaction and customization, thereby creating a service factory.<sup>13</sup>

The service factory frequently results in a movement away from personalized service toward self service. Paradoxically, this translates in-

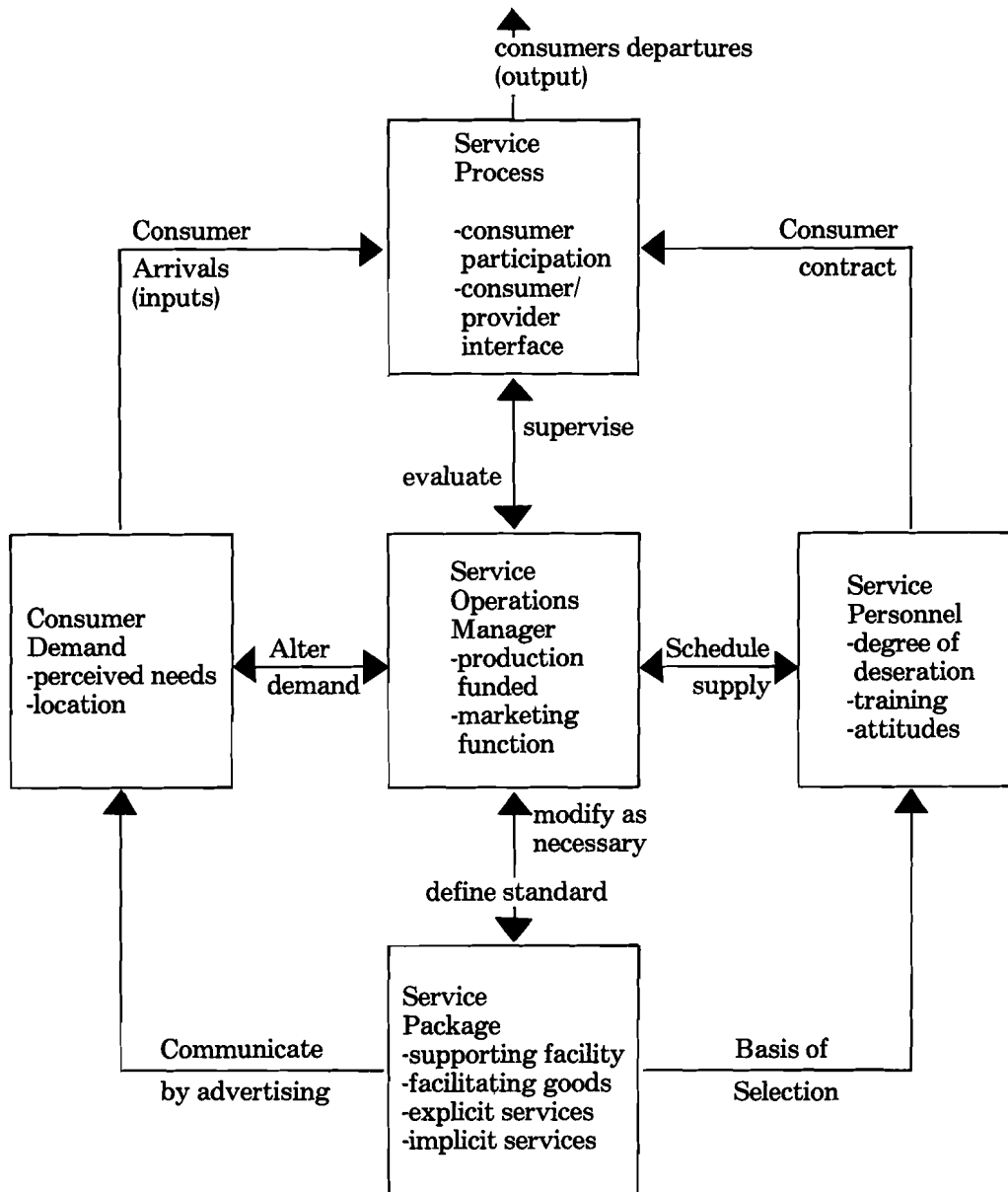
**Figure 2**  
**Approaches to Design of Delivery Systems**



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**Source:** James A. Fitzsimmons and Robert S. Sullivan, *Service Operations Management*, p. 149.

**Figure 3**  
**Fitzsimmons and Sullivan's Service System**



**Source:** James A. Fitzsimmons and Robert S. Sullivan, *Service Operations Management*, p. 27.

to managing customers. Costs are cut and profits boosted by turning customers into more efficient "employees." However, unless customers are willing to perform as expected and understand what they are expected to do and where they must go to do it, frustration, stress, and dissatisfaction will result. Consequently, service delivery systems must be designed with the customer in mind and customers may have to be educated if they are to learn how to do their "jobs."

**Service levels:** Sasser, et al., refer to service level as "the consumer's perception of the quality of service."<sup>14</sup> Since customers explicitly and implicitly rank different attributes of the service package (e.g., waiting time, cleanliness, staff attitude, etc.) on the basis of service level and price, management must determine the appropriate mix and balance of service attributes and how they can best be designed into the service delivery system. Of course, other key concerns revolve around the correct communication of the service concept with emphasis on the appropriate attributes, managing the service levels through training and quality assurance programs, and maintaining corporate focus on the critical success factors.

**Service provider:** The unique characteristic of service is the interaction or interplay of employees with every other aspect of the service system. Since each and every service encounter gives rise to dozens of what have been called "moments of truth," individuals in the organization must know their role and responsibility in producing and delivering the service attributes important to the customer. Well-trained, helpful, and courteous staff create memorable moments. Unfriendly, uncooperative, or uninterested staff create dull and disastrous moments. Clearly the survival of organizations is contingent upon ensuring a highly motivated and committed staff.

As Normann emphasizes, service businesses are "personality intensive" in that they enjoy a high degree of discretion to influence specific situations.<sup>15</sup> Therefore, Albrecht and Zemke's warning, "If you're not serving the customer, you'd better be serving someone who is," is a constant reminder of what management must do to ensure the outcome of each moment of truth.<sup>16</sup>

Since the ultimate success of service businesses is dependent upon the quality of service provided, special attention must be paid to the service encounter. In particular, attention must be given to contact employees who provide what may be termed "emotional labor."<sup>17</sup> Therefore, employee needs and problems in service encounters need to be balanced against the needs and expectations of customers. Service encounters should not be left to chance; they must be properly managed.<sup>18</sup>

### **Links Must Be Made Between Problems and Decisions**

Each of the service management models has a slightly different perspective when it comes to linking the essential service elements. Since service is a social process, the most important part of management consists of identifying the critical factors which make the particular service

system function and of designing powerful ways of controlling and maintaining these attributes in a concrete manner. Therefore, we differentiate between an overall service strategy and an operational strategy.

**Service strategy:** First and foremost in a service strategy is the need to position the service organization in the marketplace. A service strategy is a distinctive formula for delivery of a service; such a strategy is keyed to a well-chosen benefit premise that is valuable to the customer and that establishes an effective competitive position.<sup>19</sup> This chosen strategy must be based on a thorough assessment of customer expectations, analysis of competitive strengths and weaknesses, and the alignment of customer expectations with service capabilities. Strategy should serve as an organizing principle that allows contact personnel to channel their efforts toward benefit-oriented services that make a significant difference in the eye of the customer; it should also help describe the value to be offered.

To this end Heskett shows how Porter's three generic competitive strategies—overall cost leadership, differentiation, and focus—can be matched to the level of service delivered (as perceived by customers) and cost of service delivery.<sup>20</sup> However, a service concept cannot be all things to all people. It must also be reviewed in the context of innovation segmentation.

Service strategy also takes into account corporate philosophy. Choice and commitment to a service strategy relies largely on a prevailing corporate culture and normative philosophy. Normann feels that the following ingredients epitomize a solid service organization:<sup>21</sup>

- orientation toward quality and excellence
- development of a long-term relationship with clients
- investment in people and high social technology orientation
- rigorous control systems with regard to factors vital to success in the client relationship
- strong focus on delivering client value for the money and tailoring services to particular market segments.

Implementation of these attributes requires strong leadership. Therefore, leaders must be visible, set and communicate standards, evaluate and reward people, make their organization credible, and create an image that reinforces the strategic vision. There are, therefore, a number of dimensions to operating strategy—the design of services, quality and productivity, marketing of services, and operations research.

**Operating strategy/design of services:** Every service system requires procedures to ensure that the service package is properly designed. Upon implementation, systems must then be put in place to ensure that the “right” things are done right.

Shostak suggests that service organizations should subject service development to more rigorous analysis and control.<sup>22</sup> By identifying the processes that constitute the service, by noting the fail points, and

by establishing a time frame and analyzing profitability, a service blueprint can be created. She indicates that such a tool is useful in helping to highlight tangible evidence, plan service encounters, modify a service, focus on quality and productivity improvements, and determine where automation may fit and where personalized human contact should be maintained.

**Operating strategy/quality and productivity:** Virtually all the models of service systems note that successful services are those that are predictable, uniform, and dependable. Hence the importance of setting and monitoring standards for quality and productivity. However, service quality is not merely a mechanistic procedure. First of all, quality must be viewed as a philosophy pervading a whole organization: It refers to an attitude of excellence. Secondly, service quality must be seen in relative terms—relative to expectations, competitive situation, and employee capabilities—as well as in absolute terms.

Service quality invariably focuses on customer/personnel interactions. To positively influence this interaction Normann suggests that service firms have to

- get employees to empathize with client needs and to find ways to adapt accordingly
- use systems and tools to reinforce the position of the service provider, creating and enriching the interaction with the client
- create opportunities for interaction so that the employee can receive positive feedback
- shape the expectations of the client and prepare him to enter the interaction in such a way as to contribute to the social dynamic that engenders his own quality experience
- ensure that a positive, open, and service-minded climate pervades the organization<sup>23</sup>

However, both Normann and Hothschild question how far managers can go in improving the quality of interpersonal encounters.<sup>24</sup> For example, it is possible to offend the more general goals of human dignity, divert attention from more genuine attitudes of care and helpfulness, and damage the internal climate of trust and control.

Since the service concept and the appropriate market segmentation are the first factors to consider in any discussion of quality, service managers must make sure that the right people are in the job in the first place. Quality must also be built into the purchases of all other ingredients in the service package. For example, quality in the service delivery system must be assured. That means that such things as appropriate waiting and service times must be determined and standards set and enforced.

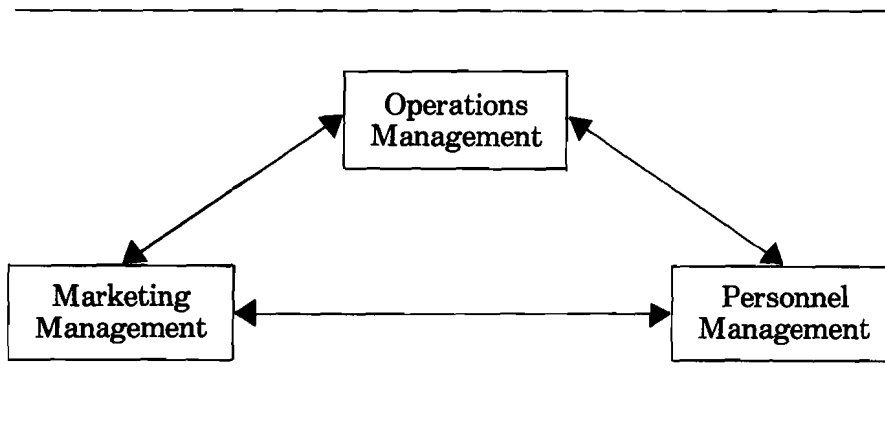
Questions relating to the productivity of services can't be divorced from issues of quality. It is not enough to restructure jobs, substitute mechanical devices or computers for service personnel, or encourage

greater customer participation. Productivity can only be enhanced positively when firms concentrate on developing customer trust, understanding customers' habits, pre-testing new procedures or equipment, understanding customers' motivations and behavior, and teaching customers how to use service innovations in a non-threatening way.

**Operational strategy/marketing of services:** Marketing practitioners and academics are actively exploring, applying, and extending marketing ideas and practices in a wide range of service situations. Service marketing books by Rathmell,<sup>25</sup> Lovelock,<sup>26</sup> Cowell,<sup>27</sup> the service marketing conference proceedings of the American Marketing Association,<sup>28</sup> and recent working papers on service marketing by the Marketing Science Institute<sup>29</sup> have created a wealth of new marketing knowledge. Not only is the concept of "product" being rethought, but marketing mix ingredients have been expanded. Marketing strategy is being developed to encourage word of mouth communication; customers are being given more tangible clues with which to judge and evaluate services; and differentiation between advertising and internal marketing activities is being advised.

**Operations/strategy/operations research:** Methods and techniques for establishing and controlling service levels, designing jobs, planning and managing capacity, forecasting demand, determining facility locations, etc. are part of the new thrust into operations research applied to service firms.<sup>30</sup> As in the case of service marketing, the distinctive characteristics of service operations suggest new insights into the problems of managing service capacity and points to the need to integrate the functions of marketing and operations in services. For example, if service is derived from the interaction of customers with the service facilities and with customers contact personnel, then the different functional departments—operations, marketing and personnel—are forced to be interdependent (See Figure 3).

**Figure 3**  
**The Service Management Triangle**



In many service businesses, however, interdependence is hard to achieve. Independence tends to be the operative word with operations guiding the way because of its predominant position. As a result, there is often a lack of balance between different orientations (cost versus revenue), different time horizons (short versus long), different motivations for change (technology driven versus customer-driven), and different approaches to change (traditional versus innovative).

Service management is becoming a recognized and accepted subset of general management. Given the continued growth of the service sector, and the almost universal belief by managers and academics that service management is in certain key respects different from goods or manufacturing based management, the rapid growth of service management literature in recent years is not surprising. A further acceleration of this interest and research activity in the years ahead is not only expected but is necessary as far more questions than answers exist at this time.

### **Implications Exist for Hospitality Management**

For hospitality managers and educators numerous intriguing implications arise from a study of the field of service management. Knowledge of service management concepts introduces opportunities to more thoroughly understand and improve hospitality management. Possible courses of action that lead from our understanding of service management are numerous.

First and foremost is the necessity for managers to become thoroughly conversant with the service management literature. In this way new service management concepts and linkages can be explained and introduced into existing management systems. For this to occur all students, whether they be part of corporate training programs or enrolled in a college or university program, should be given the opportunity to work on a wide range of service management problems in a variety of service industry settings. By understanding that airline or advertising companies share similar concerns, future hospitality managers will be able to capitalize on the service concepts used or found in other service settings. Furthermore, hospitality firms should research or help fund research to expand the application of service management concepts in a hospitality industry context.

A high quality service orientation is such a powerful competitive weapon that it is now recognized as an essential part of business strategy, not a frill. Hospitality businesses that cannot demonstrate a significant commitment to the needs of their guests will be left further and further behind. In every successful service business quality of service has become top management's most important issue.

Unfortunately, service is taken so much for granted by hospitality managers that the nuances and the subtleties of the service encountered are frequently ignored. By noting how other service businesses handle the practical difficulties involved in designing and managing encounters from a blend of views—guest perceptions, provider characteristics, and production realities—hospitality managers can develop exciting insights

into the psychology of employee/guest interactions as well as the field of environmental psychology or the guest/setting interactions.

The design of service delivery systems often gets short shrift in hospitality businesses. Not only is the simultaneous production and consumption of service often ignored, but the whole design process is often left in the hands of misinformed architects and interior designers whose focus is primarily aesthetic. Continuous emphasis on lowering labor costs, improving guest and employees satisfaction, and reducing real and perceived levels of risk will require hospitality managers to become more diligent.

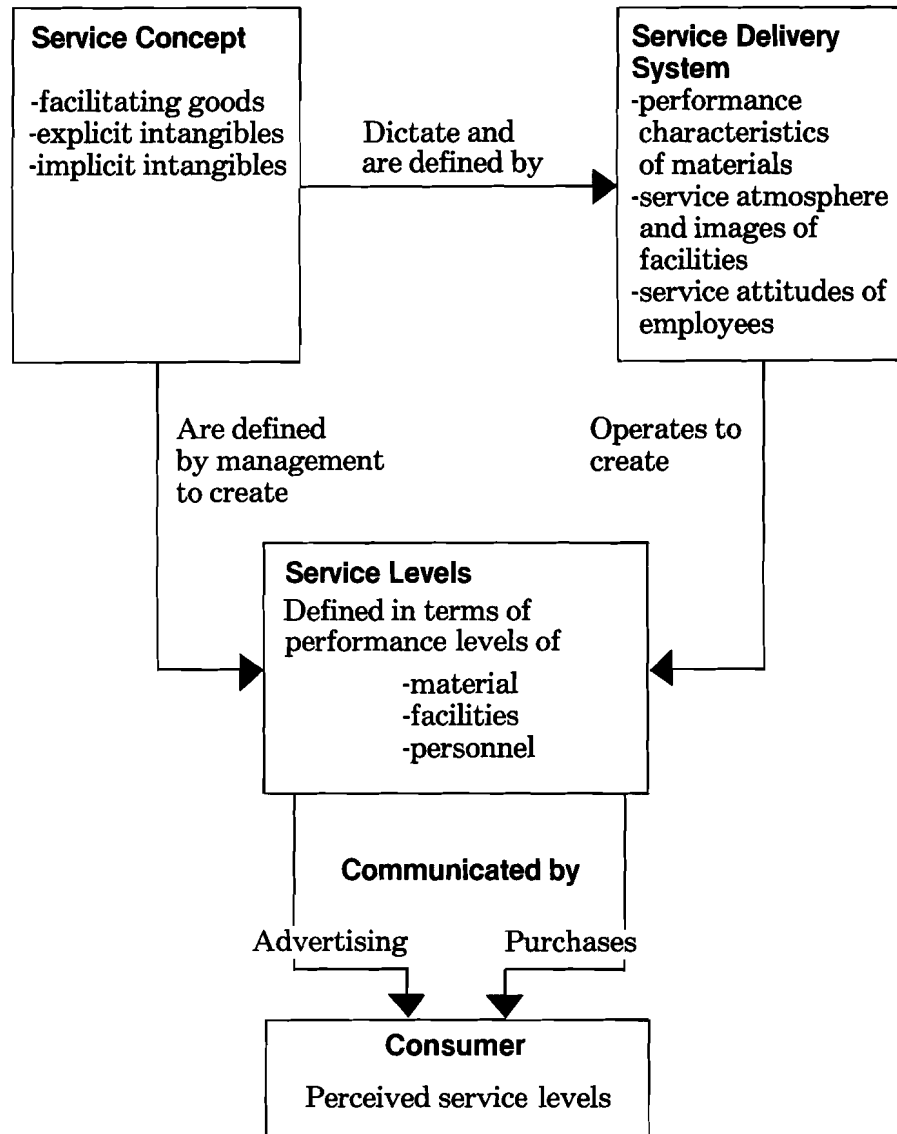
By studying the three basic approaches to the design of service delivery systems utilized by other service businesses, the technocratic production line approach, the consumer participation approach, and the consumer high-low contact approach,<sup>31</sup> new opportunities for simultaneously improving productivity and quality may be discovered.

Opinions may differ on the impact of service management concepts, but probably the most important message is the radical departure from the standard organizational charts as depictions of how a business works. By viewing businesses as processes rather than merely as structures, it becomes easier to see the customer as the center of focus, shaping and shaped by the integration of the service strategy, the operating systems, and the service providers. In this constant interplay, management's responsibility is to service the needs of the people who are serving the customers. Hospitality managers may want to seriously deliberate on this point and assess their role in providing honest-to-goodness service and hospitality within their own firms.

Service management places particular emphasis on a strategic outlook. Hospitality firms would be wise to carefully examine how they are perceived in the marketplace vis-a-vis their service concept, position, competitive situation, and management's leadership abilities. As many service businesses are beginning to discover continually rising customer expectations, competing service concepts, difficulties in building a loyal and dedicated staff, and quickly evolving technology provide the right conditions for obsolescence. Learning from the experiences of other service firms can help keep a company on track, that is, providing needed and valued services.

**Appendix A**  
**Sasser, Olsen and Wyckoff's Service System**

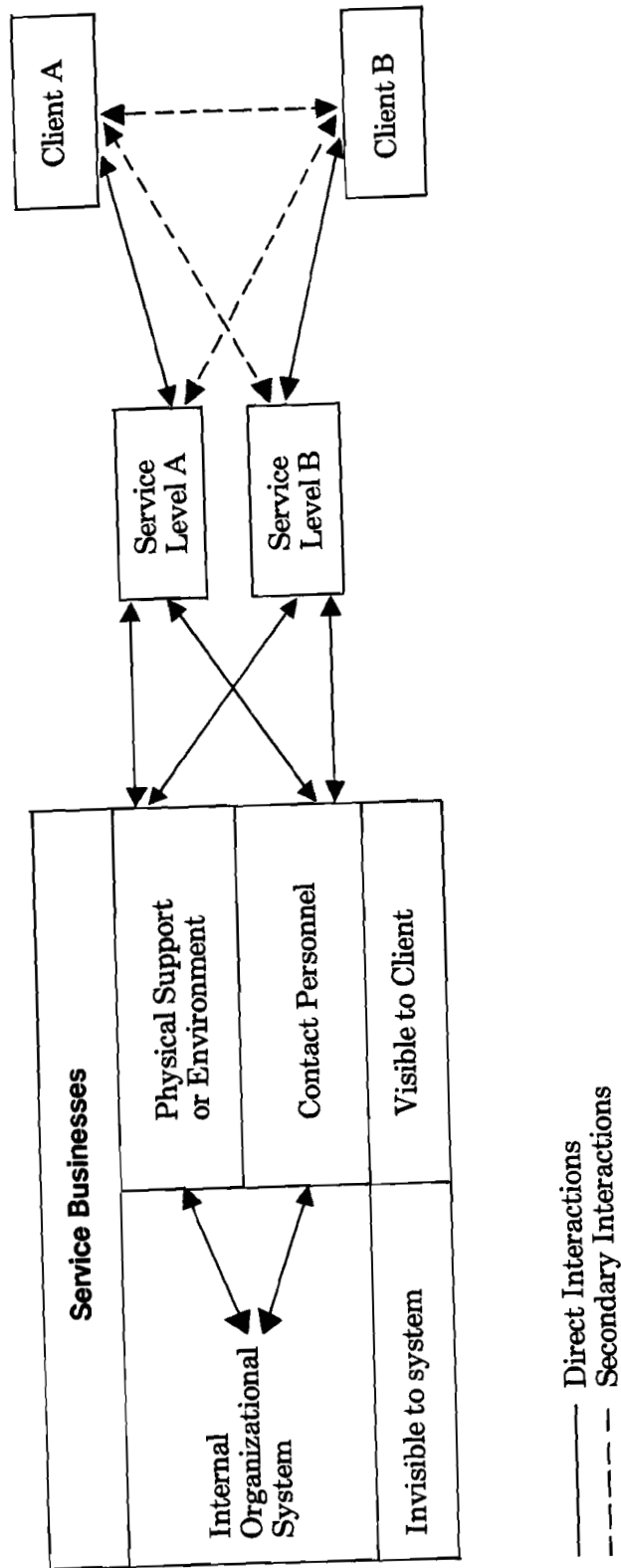
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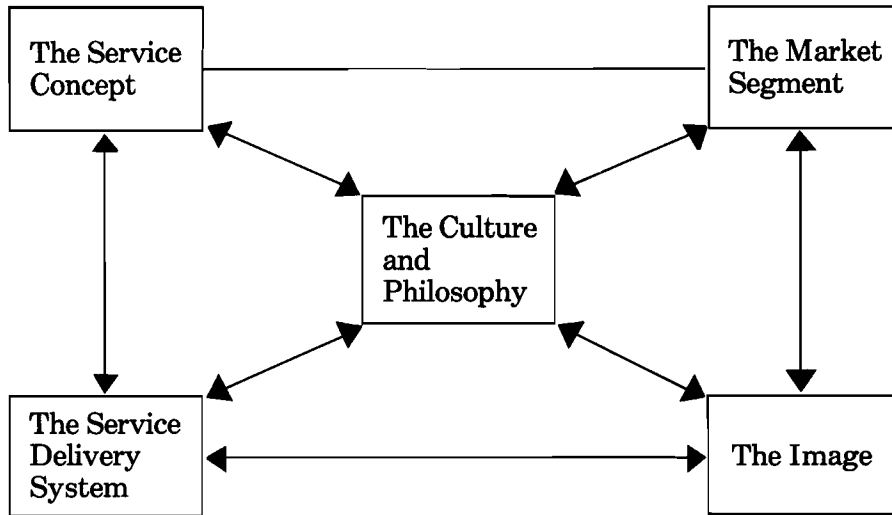
**Source:** W. Earl Sasser, R. Dave Olsen and D. Daryl Wyckoff  
*Management of Service Operations: Text, Cases and Readings*, p. 21.

**Appendix B  
Eiglier and Langeard's Service System**



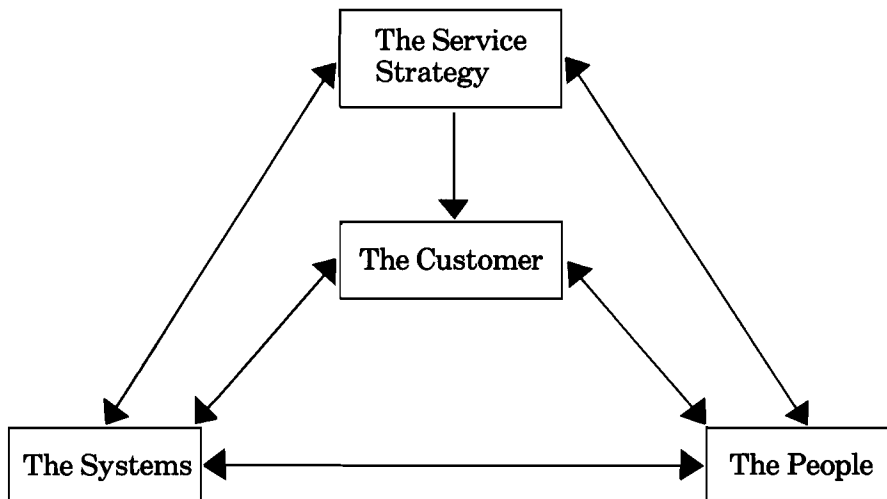
**Source:** Pierre Eiglier and Eric Langeard, "Principles de Politique Marketing pour les Entreprises de Services," Working Paper, L'Institut d'Administration des Entreprises, Université de Droit d'Economie et des Sciences d'Aix Marseille, December 1976.

**Appendix C  
Normann's Service System**



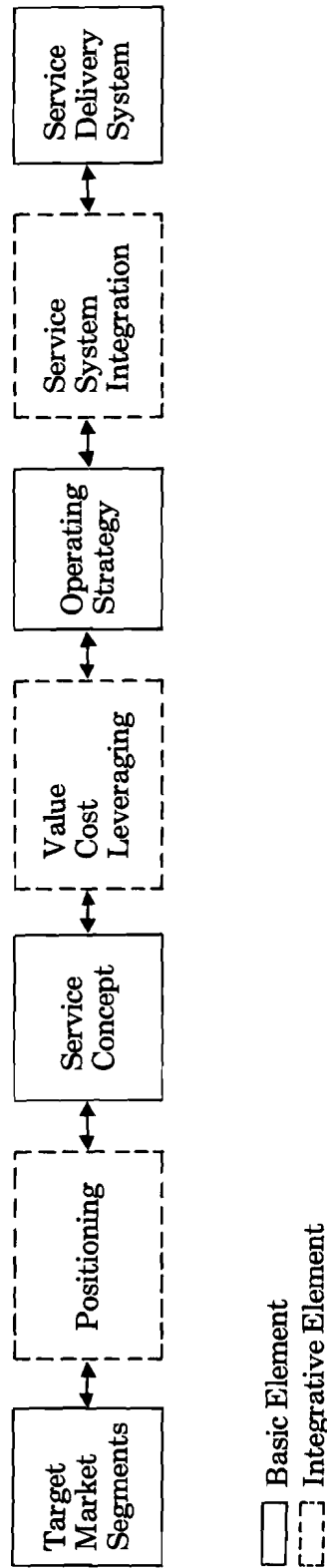
**Source:** Richard Normann, *Service Management: Strategy and Leadership in Service Businesses*, p. 20.

**Appendix D  
Albrecht and Zemke's Service System**



**Source:** Karl Albrecht and Ron Zemke, *Service America: Doing Business in the New Economy*, p. 42.

**Appendix E**  
**Heskett's Service System**



**Source:** Source: James L. Heskett, *Managing in the Service Economy*, p. 30.

## References

- <sup>1</sup>John Bateson, et al., *Testing a Conceptual Framework for Consumer Service Marketing*, (Cambridge, Mass.: Marketing Science Institute, 1978), pp. 8-9.
- <sup>2</sup>*Ibid.*, p. 10
- <sup>3</sup>*Ibid.*, p. 11, and John Bateson. "Why We Need Consumer Marketing," in O.C. Farrell, et al., *Conceptual and Theoretical Development in Marketing*, (Chicago, Ill.: American Marketing Association, 1978), pp. 131-146.
- <sup>4</sup>Christopher H. Lovelock, "Classifying Services to Gain Strategic Marketing Insights," *Journal of Marketing*, (Summer 1983), pp. 9-20.
- <sup>5</sup>W. Earl Sasser, R. Paul Olsen and D. Daryl Wyckoff, *Management of Service Operations: Text, Cases and Readings*, (Boston, Mass.: Allyn and Bacon, 1978), p. IX.
- <sup>6</sup>Pierre Eiglier and E. Langeard, "Une Approche Nouvelle du Marketing des Services," *Revue Francaise de Gestron*, (March-April, 1975), p. 1.
- <sup>7</sup>James A. Fitzsimmons and Robert J. Sullivan, *Service Operations Management*, (New York: McGraw-Hill, 1982), p. 2.
- <sup>8</sup>Richard Normann, *Service Management: Study and Leadership in Service Businesses*. (New York: John Wiley & Sons, 1984), p. xi; Karl Albrecht and Ron Zamke, *Service America: Doing Business in the New Economy*, (Homewood, Ill.: Dow Jones-Irwin, 1984), p. vi; James L. Heskett, *Managing in the Service Economy*, (Boston, Mass.: Harvard Business School Press, 1986), p. 1.
- <sup>9</sup>Albrecht and Zemke, *op. cit.*, p. 40.
- <sup>10</sup>Normann, *op. cit.*, p. 23.
- <sup>11</sup>Albrecht and Zemke, *op. cit.*, p. 81.
- <sup>12</sup>Sasser, et al., *op. cit.*, pp. 14-15.
- <sup>13</sup>Roger W. Schmenner, "How Can Service Businesses Survive and Prosper?" *Sloan Management Review*, (Spring 1986), pp. 21-32.
- <sup>14</sup>Sasser, et al., *op. cit.*, 18-19.
- <sup>15</sup>Norman, *op. cit.*, pp. 9-10.
- <sup>16</sup>Albrecht and Zemke, *op. cit.*, p. 40.
- <sup>17</sup>Arlie Russell Hochschild, *The Managed Heart: Commercialization of Human Feeling*, (Berkeley, Calif.: University of California Press, 1983), p. 7.
- <sup>18</sup>John A. Czepiel, et al., *The Service Encounter: Managing Employee/Customer Interaction in Service Businesses*, (Lexington Mass: Lexington Books, 1985), p. IX. "Each of the articles in this book deals with key issues in managing service encounters, for example, the psychology of waiting lines, risk perceptions, environmental psychology, and non-verbal communication."
- <sup>19</sup>Albrecht and Zemke, *op. cit.*, p. 64.
- <sup>20</sup>Heckett, *op. cit.*, pp. 46-47.
- <sup>21</sup>Normann, *op. cit.*, pp. 130-132.
- <sup>22</sup>G. Lynn Shostack, "Designing Services That Deliver," *Harvard Business Review*; (January-February 1984), pp. 33-39.
- <sup>23</sup>Normann, *op. cit.*, pp. 44-50; and Hochschild, *op. cit.*, pp. 89-136.
- <sup>24</sup>Normann, *op. cit.*, pp. 108-110.
- <sup>25</sup>John M. Rathmell, *Marketing in the Service Sector*, (Cambridge, Mass.: Wintrop Publications, 1974).
- <sup>26</sup>Christopher H. Lovelock, *Service Marketing*, (Englewood Cliffs, N.J.: Prentice-Hall, 1984).
- <sup>27</sup>David Cowell, *The Marketing of Services*, (London: Heinemann, 1984).
- <sup>28</sup>James H. Donnelly and William R. George, *Marketing of Services*, (Chicago, Ill.: American Marketing Association, 1981).
- <sup>29</sup>John A. Czepiel, *Managing Customer Satisfaction in Consumer Service Businesses*, (Cambridge, Mass.: Marketing Science Institute, 1980).
- <sup>30</sup>Sasser, et al., *op. cit.*, pp. 177-301; Fitzsimmons and Sullivan, p. 11. "Each of these authors provides an operations research focus, though their individual approach to the topic is different."
- <sup>31</sup>Fitzsimmons and Sullivan, *op. cit.*, pp. 148-154.