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The Sequential Relationships among Operational Capabilities and Performance in Service Industry: An Empirical Study*

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Abstract

This study seeks to identify the elements of operational capability and obtain a detailed picture of the sequential relationships among operational capabilities and business performance in the hospitality industry. In addition, it attempts to prove that the capability to offer an enhanced customer experience constitutes a core competitive advantage in service firms. A phone survey was conducted among Korean hotels, and 102 data sets were collected. Structural equation modeling and multiple regressions were used to test hypotheses using the survey data.

As a result, it was discovered an optimum path for the accumulation of operational capabilities in the hospitality industry and customer experience is revealed to be the only dimension of operational capabilities that is directly linked to market performance.

Keywords: service industry, operational capability, service resource, customer experience

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INTRODUCTION

Operations strategy and operational capability, two factors fundamental to strategic planning and corporate performance, are among the most important research topics in operations management (Boyer and Lewis 2002; Hayes, Wheelwright, and Clark 1988; Malhotra, Steele, and Grover 1994; Sum, Kow, and Chen 2004). However, research on them has been primarily confined to the manufacturing sector, so there is a dearth of empirical evidence for the service sector. Especially, most research on competitive capabilities directly applies findings from the manufacturing industry to the service industry without considering industry-specific characteristics.

Operational capability in the manufacturing sector is generally evaluated using four dimensions: cost, quality, speed, and flexibility. These are invoked by the four competitive priorities defined by the trade-off model, based on the traditional theory of production strategy. However, with the rapid development of production technology and intensification of competition, there has been increasing support for the argument that the four dimensions may support the improvement of other dimensions. Thus, it is advisable for companies to focus on improving all the dimensions rather than prioritize one over the others (e.g., Corbett and Van Wassenhove 1993; Noble, 1995; Schmenner and Swink 1998). Furthermore, when these dimensions are perceived as performance measures, it is difficult to suggest an appropriate application of production resources (Swink and Hegarty 1998). Hence, it has become common to regard the four competition perspectives (cost, quality, speed, and flexibility) as representing a firm's operational capabilities rather than its competitive priorities or operational performance.

Since the traditional manufacturing-based view defines the four dimensions as components of operational capability, a modification is needed in line with the service sector's specific characteristics to make the definitions applicable to the service industry. The recent emphasis on the link between service operations strategy and marketing in management practices and theoretical studies suggests that customer experience management is a fundamental component (Voss, Roth, and Chase 2008; Zomerdijk and Voss 2010). Customer experience is a broad concept that includes every service encounter of the customers as they make contact with suppliers, receive ser-

vices, and leave suppliers as well as the feelings and knowledge experienced through interactions. The operational management literature distinguishes this from 'quality', which refers to conformance quality and product quality consistency. It is also clearly distinct from customer waiting time or approachability. The research on service in the field of operations management has not considered the characteristic of service that creates value through interactions between customers and providers (c.f. Heinonen 2004). As researchers recognize this issue, they are giving increased attention to customer experience. Many service organizations agree that customer experience is important for customer satisfaction and loyalty and apply the customer experience factor to their core customer service strategies (Haeckel, Carbone, and Berry 2003; Pine and Gilmore 1999; Pullman and Gross 2004; Voss, Roth, and Chase 2008). In addition, recent literature shows that customer experience management positively affects performance (Voss, Roth, and Chase 2008).

As to service operations strategy, despite the many studies done on the sub-structure of organizations, including human resource management, planning and control, and quality management, few studies exist on the integration of these factors. Very little empirical evidence has been offered concerning relationship among service operations capabilities, which has been analyzed through theories adopted from manufacturing-based studies.

This study aims to identify the dimension of operational capability for service firms and suggest an integrative model by identifying the interactive structure of operational capability and performance.

THEORETICAL BACKGROUND AND RESEARCH MODEL

Service Operations Strategy and Capability

The operations strategy of service firms has generally been derived from the theories and concepts of manufacturing strategy. Early theories on operations strategy have been developed by adopting manufacturing strategy concepts wholesale, a trend still evident in recent studies. There exist several studies that actively adopt manufacturing strategy theories to explain operations strategy, based on the claim that there are more similarities than differences between services and products (e.g., Ottenbacher, Gnoth, and Jones

2006).

The literature on operations strategy defines 'capability' as the operational strength or competitive performance that a business entity has or seeks to develop (e.g., Peng, Schroeder, and Shah 2008; Boyer and Lewis 2002; Ferdows and De Meyer 1990; Flynn and Flynn, 2004; Noble 1995). Scholars assert that a firm's capability is the cornerstone of its competitiveness and that the core of the strategies pursued in any specific business environment is the development of an inimitable systematic capability that distinguishes a firm from all others (Stalk, Evans, and Shulman 1992). An operations strategy is evaluated through multidimensional measures of operational performance, including cost, quality, speed, and flexibility (Peng, Schroeder, and Shah 2008). Swink and Hegarty (1998) indicate that it is hard to suggest appropriate applications of production resources when the operations strategy is viewed from a performance perspective. When capability is assessed exclusively from a performance standpoint, however, it becomes difficult to see the implications of such application of resources (Swink and Hegarty 1998). A theory in which capability is perceived as a business activity has been proposed to overcome this limitation. Hayes and Pisano (1996) explain that capabilities are the activities by which a firm moves ahead of its rivals and are not what a company can purchase. They also argue that capabilities are organization-specific and that the more difficult they are to imitate or transfer, the more valuable the capabilities are.

An early model of competitive priorities was proposed by Skinner (1969, 1974) and later developed as the trade-off model Hayes and Wheelwright (1984). This model is based on the proposition that, as companies are generally forced to make trade-offs between diverse priorities according to their relative importance, they should decide which competitive priority would receive the most time and money. On the other hand, the cumulative model insists that the trade-off model is no more valid in the world of intensified competition and advanced manufacturing technologies (e.g., Corbett & Van Wassenhove, 1993; Noble, 1995). Advocates of the cumulative model suggest that companies should improve the four dimensions simultaneously, arguing that advanced manufacturing technologies enable the simultaneous achievement of multiple capabilities. They assert that competitive priorities are complementary rather than mutually exclusive in that they play a supportive role in

development; the most highly rated manufacturing companies excel in several dimensions, not just one (Boyer & Lewis, 2002). In the cumulative model view, the central issue is to decide the level of capabilities for all dimensions rather than choosing to emphasize one; thus, the term 'competitive capabilities' is to be preferred to 'competitive priorities'.

Scholars who espouse the integrated model offer a middle ground between the trade-off and cumulative models, having concluded that there is no evidence that one model is superior. Even Skinner (1996), who first proposed the trade-off model, has declared that his early view was too strict. Schmenner and Swink (1998) insist that, since the trade-off model compares plants at a given point in time and cumulative capabilities measure the improvements in each plant over time, the two methods do not conflict. Meanwhile, Rosenzweig and Easton (2010) argue that many empirical studies show that the trade-off relationship appears only at the highest frontier and not when there is room for improvement (e.g., Ferdows and De Meyer 1990, Lapre and Scudder 2004, Rosenzweig and Roth 2004, Roth 1996, Schmenner and Swink 1998). They argue that, since the highest frontier is reached by only a select few in an entire group, statistical analysis results are not significantly affected by the trade-off relationship (Boyer and Pagell, 2000).

Flynn and Flynn (2004) point out the important defects in precedent studies on competitive priorities and operational capabilities. First, there has been some confusion over terminology. The strategy literature uses 'competitive advantage', 'core competency', and 'competitive priority', whereas the operational management literature favors 'competitive capability', 'operational capability', 'cumulative capabilities', and 'capability'. Various meanings have been attributed to these terms, without consensus. Second, the definitions of some capabilities are difficult to simplify. Though most capabilities are multidimensional, they have been defined as if unidimensional, which makes research analysis difficult. Researchers use competitive priorities mixed with competitive capabilities to analyze results. Competitive priorities are the capabilities a firm aims to acquire, whereas competitive capabilities are those that a firm currently holds (Roth 1996, Flynn and Flynn 2004). These are chronic problems in the field and hinder the generalization of results, despite the many extant empirical studies.

Customer Experience Management

As economic development exacerbates competition between firms and services and products become commodities, customer experience management becomes an important tool for customers in differentiating economic value. This phenomenon is called the 'experience economy' (Pine and Gilmore 1998). Customers do not pay only for the characteristics or convenience of their products but care very much about the overall experience while using those products and services. This is true not only in the traditional hospitality industries such as theme parks, resorts, and hotels, but also in manufacturing. Thus, experts consider creating customer experience the most proactive approach firms can take and believe that such creation will lead to new opportunities for service innovation (Metters and et al. 2006). 'Experience' has many definitions. Conventionally, experience is defined as 'something realized through feelings or sensory perceptions of objects'. From the perspective of business administration, experience is defined in various ways. Otto and Ritchie (1996) state that experience is 'the subjective mental state felt by participants'. Edvardsson, Enquist, and Johnston (2005) define it as 'a service process that creates the customer's cognitive, emotional, and behavioral responses'. Pullman and Gross (2004) explain that customer experience occurs when customers feel emotions or obtain knowledge from interactions with different elements of a context created by service providers. Pine and Gilmore (1998) define it as incidents that individuals relate to in an individual way. In summary, experience embodies all the emotions and responses that customers experience in a business encounter (Lash 2006; Lewis and Chambers 2000; Otto and Ritchie 1996), whether they are subjective, personal, or perceptual. Therefore, firms should devote as much effort to managing emotional elements as they do to managing the functions of products or services (Berry, Carbone, and Haeckel 2002).

The scope of what is accessible to business management is limited because experience is emotional and personal. The salient dimensions in operations management are participation, context, and time (Metters and et al. 2006). Customers join an environment where experiences create emotions or impart knowledge; thus, firms can manage the customer experience by considering customer

participation in their service designs and operational functions. The term 'context' refers to the rules and procedures for the physical allocation of service equipment, the selection and arrangement of service products, and interactions between customers and service providers (Gupta and Vajic 1999). Bitner (1992) calls this the 'servicescape', the overall environment in which customers and services interact. He argues that service firms should consider the environmental dimensions, emotional factors, and interactions between employees and customers. In addition, firms need to help customers acquire memorable experiences continuously and dynamically by seriously considering the time factor, as the emerging phenomenon of experience becomes important.

Pine and Gilmore (1998) divide the customer experience into four categories: recreational experience, educational experience, aesthetic experience, and escapist experience. These four are arranged on two axes representing two kinds of customer activity—personal level participation and environmental level participation. Customers are able to create new identities and realities through these four experiences (Williams 2006), but Pine and Gilmore (1998) argue that the 'sweet spot', the ultimate experience, should include all four types of experiences. Pine and Gilmore's (1998) experience classification can be used as an important guideline for customer experience design. Firms should consider whether the four kinds of experiences are properly organized in their operational decision making, such as what kinds of experience customers can obtain from their service encounters, what services are being offered to customers, and how they manage what they offer.

However, since the customer experience includes almost everything a firm provides to its customers (such as advertising, service packaging, product and service specifications, convenience of use, and reliability) as well as quality (Meyer and Schwager 2007), it is necessary for firms to analyze the service process carefully in terms of customer experience management. Firms can assess the customer experience by identifying a service encounter, then tracing and examining the customer experience through it. In addition, by offering differentiated value to customers, firms can acquire new dimensions of competitiveness beyond cost and quality competition (Berry, Carbone, and Haeckel 2002).

A SEQUENTIAL MODEL FOR ACCUMULATION OF SERVICE OPERATIONS CAPABILITIES

Operational capability comprises a heterogeneous set of dimensions that determines the success or failure of a business (Hill and Jones 2007), and each dimension is an outcome of the combination and development of limited business resources (Grant 1991; Grewal and Slotegraaf, 2007; Moran and Ghoshal 1999). Dimensions sometimes conflict with each other because of limited resource allocation (Hayes and Wheelwright, 1984; Skinner, 1974), but one dimension can be utilized as a resource to strengthen other competitive capability dimensions, as shown in Ferdows and De Meyer's (1990) 'sand cone' model or Roth's (1996) competitive progression theory. In the most typical example, quality competitiveness is known to improve response to customer needs (flexibility), reliability (delivery), and operational efficiency (cost) significantly (Schonberger 2007; Szwejczewski, Mapes, and New 1997). An empirical study on the Japanese manufacturing industry found that when firms developed only their highest-prioritized dimension, they reached only the minimum level of development in other dimensions or fell into disorder and failed to obtain the competitive priority they sought (Nakane 1986). Therefore, managers need to allocate resources reasonably to strengthen operational capability in order to achieve a sustainable competitive advantage while understanding the causal relationship between each dimension of operational capability and performance.

The sequential relationship between the dimensions of operational capability was first proposed in Ferdows and De Meyer's (1990) sand cone model. They argue that quality is the basis of operational capability and that conformance quality improves delivery reliability, which improves speed, which finally improves cost efficiency. This view is widely accepted among academia and industry experts, but there is inadequate empirical evidence to support it. Many researchers later suggested revised models (e.g., Nakane 1986; Hall, 1987, Schmenner and Swink 1998; Swink and Way 1995), but no agreement on the optimum process of capability accumulation has been reached yet (Flynn and Flynn 2004).

Though researchers proposed different definitions of flexibility, it is generally understood as a firm's capacity to manage an organization

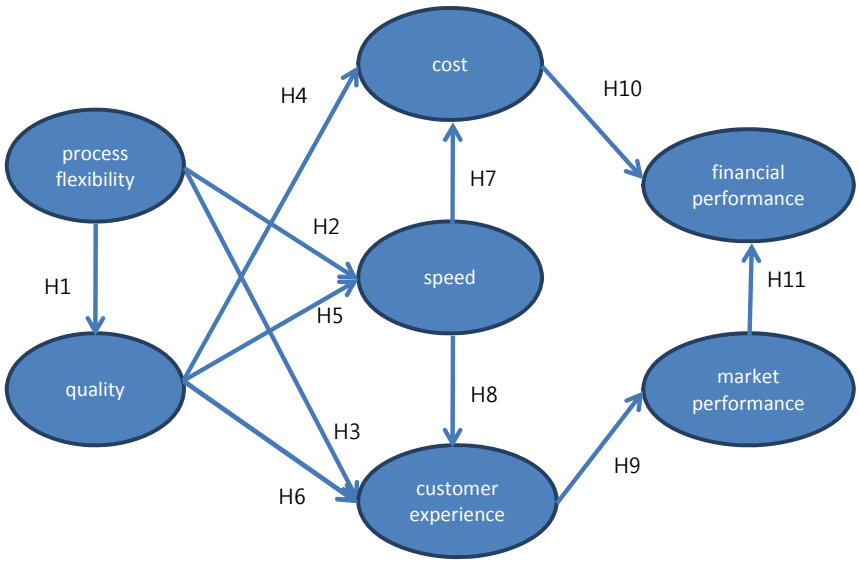

Figure 1. A structural equation model for service operations capabilities and business performance

effectively in the face of environmental uncertainty (Koste and Malhotra 1999). Because services are produced and consumed simultaneously, service firms find it more difficult to prepare for demand uncertainty than manufacturing firms do. In addition, service firms have to cater to a variety of customer needs due to the wide variety of customer encounters, and their ability to respond flexibly to different customer orders is an important factor in increasing customer value (Bettencourt and Gwinner 1996; Harvey, Lefebvre, and Lefebvre 1997). Since firms can enhance reliability and the response of service quality when satisfying changing demands and diverse customer requests, it could be inferred that strengthening the process flexibility would enhance service firms' quality capabilities. Thus, a hypothesis is derived as follows and the conceptual framework presented as in figure 1 is drawn from the structural equation modeling approach.

H1: Service firms' capability of process flexibility contributes to the strengthening of their quality capability.

The capability to change a service process quickly enables firms to deal with ad hoc service features and respond to customer requests or complaints promptly. In the manufacturing sector, which produces standardized products, a highly flexible process would reduce production speed, whereas in the service sector, considering the exceptionally numerous service encounters, various customer needs and complaints arise and prompt solutions are necessary in many cases. Therefore, we propose that service firms' capability to reallocate facilities or human resources in response to environmental changes and needs contributes to speedier service offerings.

> **H2:** Service firms' capability of process flexibility contributes to their increasing capability to provide prompt services.

Customer experience is a broad concept that includes the feelings or knowledge that customers obtain in service encounters and is divided into four categories, namely, recreational experience, educational experience, aesthetic experience, and escapist experience (Pine and Gilmore 1998). Though customer experience is a different issue from product or service diversity (Meyer and Schwager 2007), flexibility provides customers with a more individualized experience through the creation of an appropriate environment for customization (Bettencourt and Gwinner 1996). Therefore, we propose that establishing process flexibility lays a proper foundation for offering individual customers a more personalized experience.

> **H3:** Service firms' capability of process flexibility helps them develop the capability of customer experience management.

According to the literature on manufacturing strategy, quality capability controls rising production costs by preventing firms from having to redo work and the delay caused by defective products (e.g. Flynn and Flynn 2004; Nakane 1986; Rosenzweig and Roth, 2004; Hall 1987; Schmenner and Swink 1998; Swink and Way 1995). Likewise, by acquiring a certain level of quality capability, service firms can avoid increased service production costs by reducing the possibility of redoing work or service delay caused by service failure. Thus, it is inferred that service firms' quality capability contributes

to strengthening their capability to control service production costs.

> **H4:** Service firms' capability of process flexibility contributes to increasing their capability to control service production costs.

Although researchers have failed to reach an agreement on the overall optimum process of capability accumulation, most of them agree that quality capability increases delivery reliability by preventing firms from having to redo work or the delay caused by defective products (e.g., Flynn and Flynn 2004; Nakane 1986; Hall, 1987, Rosenzweig and Roth 2004; Schmenner and Swink 1998; Swink and Way 1995). As firms are able to reduce the possibility of service failure or delay by following service standards and giving prompt service, we posit that service quality capability contributes to increasing the speed of service offerings.

> **H5:** Service firms' quality capability contributes to strengthening their capability to provide prompt services.

Customer experience refers to capability that goes beyond merely fulfilling the satisfaction of basic customer expectations and is different from a differentiation factor (Voss 2003). Firms that fail to fully achieve service quality levels cannot develop more refined and value-enhancing service conditions and will perform poorly in terms of customer experience capability despite their best efforts (Voss 2003). Therefore, quality capability is a precondition of customer experience capability that strengthens the capability of customer experience management.

> **H6:** Service firms' quality capability contributes to strengthening their capability of customer experience management.

The ability to offer prompt service contributes to controlling production costs by reducing possible waste in the production and provision of services. Precedent studies of manufacturing strategy also showed that delivery reliability is proportional to cost reduction (Narasimhan and Jayaram 1998; Noble 1995). As service is produced and consumed simultaneously, delivery reliability is accepted to mean the same as the speed of service offerings. Therefore, it is proposed that a firm's capability to offer prompt service strengthens

its capability to reduce service production costs.

H7: Service firms' capability of speed contributes to strengthening the capability to reduce service production costs.

Since Parasuraman, Zeithaml, and Berry's (1985) research on the classification of ten service quality dimensions, responsiveness to customer needs has always been included as a key element in service quality discussions. From the viewpoint of marketing, service quality pertains to overall customer satisfaction, whereas in operations strategy, service quality components are better disassembled rather than understood as a package, because there is little room to discuss operational decision making when directly applying Parasuraman et al.'s (1985) service quality model. From this point of view, speed has the attribute of responsiveness to customer requests; with regard to satisfying customer expectations, speed can be seen as a quality factor in a broad sense. Following Voss, Roth and Chase's (2008) opinion, we propose that speed is a precondition to accumulate the capability of customer experience management.

H8: Service firms' capability of speed to developing the capability of customer experience management.

Mascarenhas, Kesavan, and Bernacchi (2006) claim that quality or function in the 1970s, brand and cost in the 1990s, and information and service delivery in the early 2000s are recognized as major competitive elements, whereas today the new differentiation factor is customer experience. Pine and Gilmore (1998) argue that the age of the experience economy where customer experience becomes a new competitive dimension has arrived. According to a survey of senior managers, 85% of the respondents said that they needed to do more than just differentiate traditional competitive factors, such as cost, delivery promise, and delivery time, to establish an effective management strategy (Shaw and Ivens 2002).

Customer experience in operations management is a new research area. A conceptual study (Voss, Roth and Chase 2008; Meyer and Schwager 2007) and a case study on strategies for applying the experience factor in service process design (Zomerdijk and Voss 2010) exist, but very little empirical evidence of a direct relationship

between customer experience and business performance exists. In marketing, empirical studies alone prove that applying the customer experience on service factor improves customer satisfaction and customer loyalty (Mascarenhas, Kesavan, and Bernacchi 2006; Pullman and Gross 2004; Yuan 2008). Thus, it is proposed that firms' capability to provide customers with a differentiated experience contributes to improving their market performance through customer satisfaction.

> **H9:** Service firms' capability of customer experience management contributes to improving market performance.

As curbing service production costs does not directly relate to customer satisfaction improvement, it is difficult to confirm its direct relationship with market performance. However, from the perspective of controlling input resources and avoiding wasteful factors, controlling service production costs may be inferred to contribute to financial performance, including net income ratio or return on assets ratio.

> **H10:** Service firms' capability of cost containment contributes to improving the financial performance of service firms.

As market performance is the foundation of financial performance, we propose that financial performance is proportional to market performance.

> **H11:** Service market performance contributes to the financial performance of service firms.

EMPIRICAL ASSESSMENT

Firms' geographic location or industrial environment influences the types or convenience of capability accumulation and the mutual relationships among capabilities (Flynn and Flynn 2004; Rosenzweig and Easton 2010). Therefore, it is reasonable to analyze a specific industry in a specific region in order to derive significant inferences from the study. Consequently, the study limited the research scope to the Korean hospitality industry and surveyed executives of

Table 1. Domestic Hotel Industry Statistics (2013)

Grade		Seoul	Busan	Daegu	Incheon	Gwangju	Daejeon	Ulsan	Jeju	Others	Total
Special 1st	# of Hotels	18	5	3	3	1	1	2	12	16	61
	# of rooms	9,399	2,239	696	1,020	120	174	495	3,622	4020	21,785
Special 2nd	# of Hotels	25	6	6	6	2	2	0	5	26	78
	# of rooms	5,924	1,037	674	1,380	198	393	0	507	3870	13,983
1st	# of Hotels	33	12	3	2	7	7	0	18	90	172
	# of rooms	3,656	1,160	147	135	440	476	0	1,600	6668	14,282
2nd	# of Hotels	23	12	0	11	5	7	2	5	55	120
	# of rooms	1,412	584	0	506	197	255	146	284	2696	6,080
3rd	# of Hotels	13	12	0	8	2	4	1	2	33	75
	# of rooms	666	962	0	330	75	193	75	123	1583	4,007
Not yet rated	# of Hotels	18	3	11	9	3	2	2	9	58	115
	# of rooms	1,303	467	637	417	113	119	65	540	3373	7,034
Total	# of Hotels	130	50	23	39	20	23	7	51	278	621
	# of rooms	22,360	6,449	2,154	3,788	1,143	1,610	781	6,676	22210	67,171

Source: Tourism Knowledge & Information System 2013.

member firms registered with the Korea Hotel Association to collect data.

A survey was conducted over the telephone by professional interviewers. We first called 655 hotels registered with the Korea Hotel Association at their main telephone number to inquire about respondents and set up an appointment for the survey. After

Table 2. Sample Characteristics

	# of responses	Minimum value	Maximum value	Mean	SD
The number of employees	102	13	2100	233.37	306.45
Revenue of 2009 (100 million won)	88	9.0	4278	318.28	658.09
Room occupancy rate (%)	101	30.0	95	72.69	14.03
The number of rooms	102	50	1200	234.28	176.19

contacting 400 firms in sequential order of registration, 102 total responses were collected. All the 102 data sets were valid because the survey was carried out one-on-one by interview specialists and not mailed to participants.

The instruments used in this study are based on established measures utilized in previous studies (see table 3). However, in the case of concepts that lacked any concrete measurement indexes or contents that were difficult for respondents to understand, we modified the constructs on the basis of the results of precedent studies.

Measurement items are assessed using cognitive scales. A cognitive scale's weakness is that it is hard to eliminate the subjective convenience of a respondent. However, management's understanding and knowledge of an organization allow them to make reasonable judgments. Thus, despite its weakness, the cognitive scale is considered valid and reliable (Zahra and Covin 1993). In addition, we need to establish multiple one-dimensional measures of a construct for covariance structural model analysis, but it is very difficult to get the solid data satisfying this condition. Furthermore, in the hotel industry's case, that is, the target industry of this study, many corporations are reluctant to disclose the objective figure of operational dimensions, since few are publicly listed companies.

We assess both discriminant and convergent validity through confirmatory factor analysis(see table 4); nomological validity is verified through correlation matrix analysis among constructs (see table 5). First, convergent validity is assessed using standardized factor loadings and p-values of the measurement items on their respective constructs as well as average variance extracted (AVE). The standardized factor loadings range from 0.723 to 1 and

Table 3. Measurement items

Research variable and measurement items		References	Mean	SD
What do you think of your company's competitiveness of service operations listed below in the same industry? (7 point Likert scale, very low=1, very high=7)				
Cost containment				
cost1	Operational cost reduction	Butler, Leong, and Everett (1996); Grawe, Chen, and Daugherty (2009)	5.14	.845
cost2	Input cost reduction		4.94	.842
cost3	Wasteful factor removal		5.37	.943
Quality				
qual1	High-quality service	Boyer & Lewis(2002); Boyer and McDermott (1999); Ward et al.(1998)	6.33	.736
qual2	Consistent service quality		6.38	.732
qual3	Customer complaint reduction		5.78	.740
qual4	Reputaion within industry		5.72	.979
qual5	Service standards setting and compliance		6.25	.872
Speed				
spee1	Prompt resolution of customer complaints	Parasuraman et al.(1985); Nair (2005); Rosenweig, Roth and Dean(2003)	6.11	.730
spee2	Prompt response to customer orders		6.13	.792
Process flexibility				
flex1	Rapid change of facility arrangement	Sawhney (2006); Nair and Boulton (2008); Butler and Leong(2000)	5.56	.950
flex2	Rapid change of human resrouce allocation		5.87	.919
Customer experience management				
expr1	Diverse attractions	Pine and Gilmore(1998)	3.70	1.705
expr2	Opportunities to participate in new roles		3.99	1.743
expr3	Diverse educational experience		3.45	1.526
expr4	Diverse aesthetic experience		3.29	1.446
Financial performance				
perf1	Net profit in last year	Rosenweig, Roth and Dean (2003)	4.40	.740
perf2	Return on assets ratio in last year		4.26	.664
Market performance				
perf3	Revenue growth rate	Grawe, Chen and Daugherty(2009)	4.60	.852
perf4	Market share		4.89	.921

Table 4. Result of measurement model analysis

Construct	Measurement item[a]	Standardized factor loading[b]	SMC	AVE	Construct reliability	Cronbach's alpha
Cost containment	cost1	.857	.734	.741	.917	.891
	cost2	.892	.796			
	cost3	.832	.692			
Quality	qual1	.939	.882	.786	.964	.944
	qual2	.947	.896			
	qual3	.806	.650			
	qual4	.871	.759			
	qual5	.862	.744			
Speed	spee1	.884	.781	.891	.985	.937
	Spee2	.999	.999			
Process flexibility	flex1	.904	.817	.775	.950	.872
	flex2	.856	.733			
Customer experience	expr1	.951	.904	.899	.890	.971
	expr2	.959	.919			
	expr3	.953	.908			
	expr4	.930	.865			
Financial performance	perf1	.894	.799	.846	.977	.913
	perf2	.945	.894			
Market performance	perf3	.723	.522	.651	.821	.777
	perf4	.883	.779			

a: The result of normality test of measurement items (skewness < 2, kurtosis < 7) confirmed no effect of normality on estimation Curran, West, and Finch (1996).

b: ML estimation method used, all significant p<.000

Goodness-of-fit statistics: x^2(df=149, N=102),=224.994, p<.000, TLI=.954, CFI=.964, RMSEA=.071

are significant at p<0.01, with AVEs exceeding 0.5, thus strongly supporting convergent validity. Each SMC value, a test coefficient of communality, was over 0.5, meaning that a potential variable explains each measurement item by more than half. Convergent validity can also be examined by construct reliability, whose value equal to or greater than 0.6 is understood to be evidence of convergence validity (Bagozzi and Yi 1988). As the construct reliability was in the range of 0.821~0.985, a convergent validity test using the value of construct reliability did not reveal any problems.

Table 5. Correlation matrix

Construct	1	2	3	4	5	6	7
1. Cost containment	1.000						
2. Quality	.538	1.000					
3. Speed	.489	.596	1.000				
4. Process flexibility	.623	.807	.652	1.000			
5. Customer experience	.639	.624	.562	.699	1.000		
6. Financial performance	.101	.033	.033	.153	.116	1.000	
7. Market performance	.388	.202	.178	.410	.325	.909	1.000

Discriminant validity among constructs was verified by examining whether or not AVE is greater than the square of the correlation coefficient among constructs (Φ^2) (Fornell and Larcker 1981). All 21 values satisfied this condition, confirming the discriminant validity.

Additionally, there were no issues with nomological validity, as the correlation matrix values matched those proposed in the hypotheses.

Constructs measured with multi-items need a reliability test to evaluate whether the measurement items appropriately reflect the corresponding variable. In this study, as shown in table 3, all Cronbach's alpha values were greater than 0.7, meaning there were no problems with reliability (Nunnally 1967). Fit indices satisfied the acceptance level, and the reliability of the constructs used in this study was acceptable because of the credible level of combined reliability (Fornell and Larcker 1981).

Table 5 shows the results of hypothesis testing of the structural relationships among latent variables. Test results of the research model with covariance matrix confirmed that fit indices are within an acceptable range, showing x^2(df = 149, N = 102) = 224.994, $p < .000$, TLI = .954, CFI = .964, RMSEA = .071. However, as flexibility is the only exogenous variable, we did not calculate covariance among exogenous variables. Except for the SMC of business performance whose path hypotheses are all rejected, all other SMCs of endogenous variables were in the range 0.503~0.776. This range falls within that regularly reported in research articles that use the structural equation model. Thus, there is additional support for this research model except in regard to relationships between the sub-dimensions of operational capability and business performance (c.f. Brady and Cronin 2002).

As the test results for each path, all hypotheses about the

Table 6. Result of research model

Hypothesis	Unstandardized coefficient	Standardized coefficient	Standard error	c. r.	Result
H1: Process flexibility → Quality	.663	.817	.071	9.292***	Supported
H2: Process flexibility → Speed	.395	.515	.135	2.292**	Supported
H3: Process flexibility → Customer experience	.904	.458	.351	2.573**	Supported
H4: Quality → Cost containment	.428	.402	.123	3.466***	Supported
H5: Quality → Speed	.168	.177	.154	1.085	Not supported
H6: Quality → Customer experience	.382	.157	.372	1.026	Not supported
H7: Speed → Cost containment	.283	.252	.127	2.235*	Supported
H8: Speed → Customer containment	.439	.171	.268	1.640	Not supported
H9: Customer experience → Market performance	.119	.299	.042	2.808**	Supported
H10: Cost containment → Financial performance	-.223	-.235	.061	-3.655***	Not supported
H11: Market containment → Financial performance	.983	.941	.125	7.888***	Supported
SMC(quality)	.667				
SMC(speed)	.445				
SMC(customer experience)	.516				
SMC(cost containment)	.346				
Fit indices		x^2(df=159, N=102)=254.769, p<.000, TLI=.945 CFI=.954 RMSEA=.077			

*p<0.05, **p<0.01, ***p<0.000

relationship between the lower levels of the operational capability were accepted, but hypotheses about the relationship of the operational capability and performance were rejected.

DISCUSSION AND CONCLUSIONS

Although there have been many empirical studies on operational capability, most of them were performed in the manufacturing sector and very few in the service sector. Specifically, there was no general agreement on the constructs of operational capability in relation to the service sector. Most empirical case studies focused on competitive priorities, that is, management's prioritizing of operational capability dimensions; very few considered the causal relationships between each operational capability dimension or the performance and cumulative capabilities of interactions among capability dimensions.

Therefore, this study sought to bridge this research gap and propose an effective means of developing operational capabilities to strengthen service firms' competitiveness.

Hierarchical Relationships among Service Operations Capabilities

Traditionally, four dimensions of operational capabilities are discussed in operations management research: cost, quality, speed, and flexibility. In this study, we added customer experience as the fifth dimension, which deserves attention as a new competitive factor that reflects the unique characteristics of the service sector. By doing so, we suggest the possibility of expanding the discussion on the service sector to the manufacturing sector. Based on the results of precedent studies, we proposed a research model that implied causal relationships among each dimension of operational capabilities and interactions between dimensions and performance. Covariance structure model analysis was conducted with data collected from the Korean hospitality industry, and 7 paths among 11 were accepted as having statistical significance. Key summaries are as follows:

(1) Process flexibility → quality → cost reduction
(2) Process flexibility → speed → cost reduction

(3) Process flexibility → customer experience → market performance → financial performance

As for cumulative capabilities, sequential cumulative paths to improve the performance of each operational capability depend on the industry, social environment, and market environment. Therefore, an optimum path that is universally applicable to every industry and market does not exist, though we can explore an optimum path for a segmented market. Such segmentation is the main reason that there is no consensus among researchers, despite numerous studies on cumulative capabilities.

Therefore, firms need to identify potential dimensions for competitive capabilities on the basis of their knowledge of the industry, perform analyses, and design an implementation plan by means of which they can strengthen their operational capabilities to effectively improve these dimensions.

Customer Experience Management as a Competitive Capability

This study proposes the capability of service firms to define and design different types and attributes of experiences for their customers as a new dimension of operational capabilities and analyzes this capability collectively with other traditional factors of operations strategy from the perspective of cumulative capabilities. According to this study's results, customer experience is revealed to be the only dimension of operational capabilities that is directly linked to market performance. Thus, we may conclude that it is a key competitive capability factor in the hospitality industry.

Limitation and Future Research

By limiting the study's analysis to the Korean hotel industry, this study succeeded in providing practical insights but was inadequate in strengthening the theoretical foundation of general operations management.

Since the firm size may influence these capabilities and the degree of competition may influence financial and market performance, examining firm size and the degree of competition and enlarging sample size are needed to get a more accurate assessment of the effect of capability on performance.

Additionally, respondents' subjectivity was not completely excluded, since a cognitive scale was used in testing most concepts because of the difficulty in data gathering.

Especially, as pointed out by Rosenweig and Easton (2010) although the cumulative model implies sequential order and one needs a time-series analysis to directly prove the model, this study ended up using cross-sectional analysis.

Therefore, in order to generalize the conclusions of this study, it is necessary to apply the conceptual framework of this study to other industries and compare results with one another. It is also necessary to supplement the interpretation of the results by providing an alternative scale or by adding solid data to the analysis. In addition, by subdividing the dimensions of constructs and analyzing materialized concepts, the practical insights gained from the results of this study may be strengthened.

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