

Innovation Management in Services Industries: The Impacts of Innovative Capacity and Transformative Learning

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Abstract

This study highlights the innovation management and learning perspective of a firm's innovative capability. The model proposed in this study examines the relationships among competence exploitation, competence exploration, transformative learning, innovation, and performance. This study presents empirical results from 225 service industry in Taiwan. First, the innovative capability factors positively affect transformative learning include competence exploitation and competence exploration. Transformative learning in turn has positive effects both on innovation and performance. Secondly, the rank order effects on innovation are competence exploitation, competence exploration, and transformative learning, respectively. The rank order effects on performance are competence exploration, competence exploitation, and transformative learning, respectively. Finally, transformative learning is the mediating effect of competence exploitation and competence exploration on innovation and performance.

Keywords: competence exploitation, competence exploration, transformative learning, innovation, performance

1. Introduction

As the innovation management is associated with learning capacity. Innovation is embedded in market- or learning-oriented firms. An innovative firm culture can guide an organization to develop new abilities (Hurley & Hult, 1998). Ability to learn quickly and high internalization of knowledge are key competitive advantages in the firms (Lee, Liang, & Liu, 2010). As a result, managing knowledge transfer has become a challenge for inter-firm (Zahra & George, 2002). Recently, firms have faced a strategic dilemma in developing new customized products or services. Atuahene-Gima (2005) showed that exploiting existing competencies may provide short-term benefits, but ultimately becomes a hindrance to the firm's long-term viability by stifling the exploration of new competencies (Levinthal & March, 1993). For example, many companies seek to develop their existing capabilities but hesitate to develop new abilities (O'Reilly & Tushman, 2004). This Capability-rigidity Paradox indicates that the exploitation of competence tends to crowd out the exploration of competence (Leonard-Barton, 1992). In general, learning-oriented firms are more likely to exhibit this element of firm culture (Hult & Ketchen, 2001).

The RBV indicates that learning development and innovation is a distinctive capacity of organization (Day,

1994). The innovation characteristics contribute to the creation of greater firm value and achieving better organizational performance (Hurley & Hult, 1998). However, data on learning-oriented firms suggests that innovation management is more complex than previously depicted (Lichtenthaler, 2009). Further investigation is required to compensate for a lack of previous research. Previous studies have paid scant attention to services or how the mediating role of organizational learning influences innovation and performance.

The purpose of this study was to discuss the relationships among competence exploitation, competence exploration, transformative learning, innovation and performance. Innovative capability includes competence exploitation and competence exploration. The service innovation of Taiwan was used as the background, to ensure compliance with innovation management approaches (Hult & Ketchen, 2001). Secondly, data was collected on benchmark enterprises in service, to gain an understanding of how innovative capability drives transformative learning through innovation and performance. And explored in-depth the high-level learning process (Slater & Narver, 1995). Thirdly, the integration of learning-oriented and innovation was supported by key references (Hurley & Hult, 1998). This study also believe that the absorptive capacity as the process-based using the service innovation (Lichtenthaler, 2009). Referring the viewpoint of transformative learning proposed by Slater and Narver (1995), the dual theory is applied to the study of innovation and performance

2. Method

2.1. Innovative Capability

Firms have faced a strategic dilemma in developing new customized products or services. Many companies seek to develop their existing capabilities but hesitate to develop new abilities (O'Reilly & Tushman, 2004). This type of innovative capability is related to the absorptive capacity proposed by Cohen and Levinthal (1990) (Hurley & Hult, 1998). Absorptive capacity has a significantly positive influence on the internalization of knowledge (Lee et al., 2010). Absorptive capacity is the ability of a firm to assimilate and apply innovative information or elements (Lichtenthaler, 2009). An innovative corporate culture promotes the combination of organizational resources and the internalization of knowledge to cultivate even greater innovative capacity. Companies with greater innovative capacity are better able to develop and maintain competitive advantage, and achieve stronger organizational performance (Day, 1994). Based on the above, firms

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tend to enhance the two capabilities to increase the chances of simultaneous success for competence exploitation and competence exploration (Atuahene-Gima, 2005).

2.2. Transformative Learning

Organizational learning is vital to corporate success (Day, 1994; Hult & Ketchen, 2001). Maintaining learning capacity stronger than that of competitors is vital to maintaining competitive advantage (Dickson, 1992). Continual learning drives behavioral and operational changes, which in turn leads to improve firm performance (Sinkula, 1994). A successful learning organization must be equipped with a suitable organizational structure and a high-level learning processes (Argyris, 1977), in order to promote the development of knowledge. The development of new knowledge or insight during the process of organizational learning can potentially influence behavior (Hurley & Hult, 1998) and contribute to improve firm performance (Slater & Narver, 1995). Based on the above, this study posited that transformative learning plays a mediating role in processing the flow of innovation information.

2.3. Innovation

Innovativeness is embedded in market- or learning-oriented firms. The cultures of these firms are more exploratory, discovering the expressed and latent needs of customers (Slater & Narver, 1999). The deepest manifestations of market and learning orientations appear at the cultural level (Schein, 1985). A firm with an innovative culture adopts or implements new ideas, products, and processes through management innovation. The goal of this approach is to achieve high performance for the firm (Slater & Narver, 1995). Based on the above, this study defines innovation as a firm's receptivity to new ideas and innovation as part of organizational competitive advantage (Hurley & Hult, 1998)

2.4. Competence Exploitation, Competence Exploration, Transformative Learning and Innovation

Focus on the service industry, firms are increasingly relying on external knowledge to foster innovation and enhance their performance. Hurley and Hult's (1998) organization and market driven innovation model points out the innovative capacity to competitive advantage and performance. Innovative capacity is related to absorptive capacity (Cohen & Levinthal, 1990; Lichtenthaler, 2009). Due to the managerial challenges of inter-firm knowledge transfer, absorptive capacity is a major source of competitive advantage (Zahra & George, 2002). Such process-based capacity is a firm's ability to utilize external knowledge through the sequential processes of exploitative, exploratory, and transformative learning (Lane, Koka, & Pathak, 2006). Therefore, competence exploitation involves the application of external knowledge through realized absorptive capacity. Competence exploration is the acquisition of external knowledge through potential absorptive capacity (Zahra & George, 2002). Transformative learning links these two competences to maintaining knowledge over time (Garud & Nayyar, 1994). A process-based firm is better able to engage in innovation and achieve higher performance (Day, 1994). Based on the above, this study proposes Hypotheses 1, 2, and 3:

- H1: Competence exploitation has a positive effect on innovation.
- H2: Competence exploration has a positive effect on innovation.
- H3: Transformative learning has a positive effect on innovation.

2.5. Competence Exploitation, Competence Exploration, Transformative Learning and Performance

Atuahene-Gima (2005) stressed that innovative capacity is a measure of organizational capability and competitiveness. Firms face a strategic dilemma in the development of customized new products or services. Exploiting competence may provide short-term success, but it can become a hindrance to the firm's long-term viability by stifling the exploration of new competencies (Levinthal & March, 1993). The number of innovation organization is able to successfully adopt or implement can measure the definition of innovative capacity. The degree to which the culture within a firm is open to innovation, combined with its resources and other organizational characteristics, increases the capacity for innovation. Firms develop a greater capacity for innovation, develop a competitive advantage, and can achieve higher levels of performance (Day, 1994). Based on the above, this study proposes Hypotheses 4, 5, and 6:

- H4: Competence exploitation has a positive effect on performance.
- H5: Competence exploration has a positive effect on performance.
- H6: Transformative learning has a positive effect on performance.

2.6. Antecedents of Transformative Learning

According to the capacity-based resource advantage is scarce, relatively non-transferrable, and difficult for competitors to understand or imitate (Reed & DeFillippi, 1990). In cultivating innovative capacity, knowledge has become a management challenge for inter-firm, and rapid learning capacity is a key competitive advantage (Zahra & George, 2002). Innovative capacity of a firm is related to its learning ability (Hurley & Hult, 1998), strong firms tend to apply external knowledge to conduct processes of exploitation, exploration, and transformative learning (Lane et al., 2006). The variability generated by the continuous learning and transformation process puts pressure on the organization and development (Levitt, 1980). Based on the above, this study proposes Hypotheses 7 and 8:

- H7: Competence exploitation has a positive effect on transformative learning.
- H8: Competence exploration has a positive effect on transformative learning.

3. Methods

After the atlas of new designs is obtained, a detailed design can be carried out by selecting one from the atlas.

3.1. Sample, Pretest and Data Collection

This study collected a sample from the China Credit Information Service Limited. (CCIS) published by the top 5000 largest corporations in Taiwan, which selects the top 2000 service. This study, according to Lichtenthaler

(2009), proposes absorptive capacity as the process-based with a focus on specific topics using the service innovation. General services finance, and information firms are typical representative of the service industry.

This study mailed questionnaires to firms. To increase the return rate, the following steps were taken: 1) According the latest corporation directory published in 2010 by CCIS, a postage-paid return envelope was included the questionnaire directly mailed to the general managers; 2) return letter to advertising; 3) research institutions, researchers and contacts were listed; 4) released in August to avoid releasing peak. Before mailing the questionnaires, this study used convenient sampling to select 60 service firm managers and 60 EMBA students. A pretest was conducted in one month. There were 118 valid samples. The results of the reliability analysis of Cronbach's α were all higher than the standard value of 0.7 recommended by Nunnally (1978) for each dimension initiated a large-scale release.

3.2. Measures

The respondents of this study consisted of general managers for each firm. Except for the demographics (age, capital, employee, turnover, and listed/OTC company), the questionnaire used a Likert 7-point scale for the survey, with 1 indicating "strongly disagree" and 7 indicating "strongly agree".

This study operates as a multidimensional described as the following: The definition of innovative capacity is the organizations invest in service innovation and the pursuit of knowledge, skills, and processes, which converted to core competencies. Two dimensions based on Atuahene-Gima (2005) included competence exploitation (five items) and competence exploration (five items). The definition of transformative learning is the firm with innova-

tive capacity uses organizational learning to connect with the outside-in process. The items based on Lichtenthaler (2009) included one dimension is transformative learning (eight items). The definition of innovation is the culture of a firm with innovativeness to implement new ideas, product, or processes successfully. The items based on Hurley and Hult (1998) included one dimension is innovation (four items). A firm evaluates the organizational performance by using subjective performance indicators to analyze firm-level performance. The items based on Kirca, Jayachandran, and Bearden (2005) included one dimension is performance (three items).

4. Generalization and Number Synthesis

4.1. Sample, Pretest and Data Collection

This study mailed questionnaires to the top 2000 service in Taiwan. 241 of these firms replied (12.0%) and after removing the invalid ones, a total of 225 valid questionnaires (11.2%) remained. Non-Response bias test was applied (Armstrong & Overton, 1977). The following is the basic data of this study. More than half of the service firms in the sample have been in operation for more than 21 years (52.4%), and have capital of under 500 million NTD (56.0%), turnover under 5 billion NTD (79.1%), less than 500 employees (76.9%). A smaller percentage was listed/OTC companies (23.5%). These results reflect the status of the service in Taiwan.

The Cronbach's α of the competence exploitation, competence exploration, transformative learning, innovation, and performance are 0.797, 0.912, 0.916, 0.849, and 0.735, respectively, which were all higher than the standard of 0.7 suggested by Nunnally (1978). This indicates that the internal consistency of measuring each dimension is good (Table 1).

Table 1 The reliability of the variables examined

Variables	Items	Mean	Std.	α	CR	AVE	Reference
CEi	5	5.8	3.33	0.797	0.892	0.652	Atuahene-Gima (2005)
CEr	5	5.8	3.38	0.912	0.932	0.732	
TL	8	5.8	5.41	0.916	0.938	0.655	Lichtenthaler (2009)
IN	4	5.8	3.19	0.849	0.867	0.627	Hurley & Hult (1998)
PM	3	5.7	2.37	0.753	0.785	0.552	Kirca et al. (2005)

Note: CEi=Competence Exploitation; CEr=Competence Exploration; TL=Transformative Learning; IN=Innovation; PM=Performance. Std. =Standard Deviation; α =Cronbach's α ; CR=Composite Reliability; AVE=Average Variance Extracted.

Table 2 Matrix of the related coefficients

Variables	1	2	3	4	5
CEi	(0.807)				
CEr	0.805*	(0.856)			
TL	0.733*	0.744*	(0.809)		
N	0.705*	0.684*	0.697*	(0.792)	
PM	0.557*	0.541*	0.552*	0.435*	(0.743)

Note: Number in brackets is AVE square values; * $p < 0.001$

The measurement of the validity in this study refers to the development of literature for theoretical basis. The results indicated that the factor loadings of all items were significant, with composite reliability (CR) between 0.785~0.938, which was higher than 0.7, and average variance extracted (AVE) between 0.552~0.732, which was higher than 0.5. This study showed convergent validity of measurement

items (Fornell & Larcker, 1981). The variables were referenced with a number of indicators to measure fitness. The model showed good convergent validity. The discriminant validity is the measurement of the discriminant extent among dimensions suggested by Fornell and Larcker (1981). The result showed that the correlation between any two dimensions in this study was less than the AVE square of each dimension, which means that there is discriminant validity among these dimensions (Table 2).

4.2. Hypotheses Testing

The structural equation modeling (SEM) was conducted using maximum likelihood estimation (MLE). The goodness of fit index of the whole model of this study is $\chi^2=756.508$, d.f.=260, $\chi^2/d.f.=2.910$, GFI=0.806, AGFI=0.758, CFI=0.847, RMSR=0.082, RMSEA=0.092,

NFI=0.822 , PNFI=0.712. A number of goodness-of-fit indexes fit the acceptable standard, which meant that the model fit was good (Fig. 1 & Table 3).

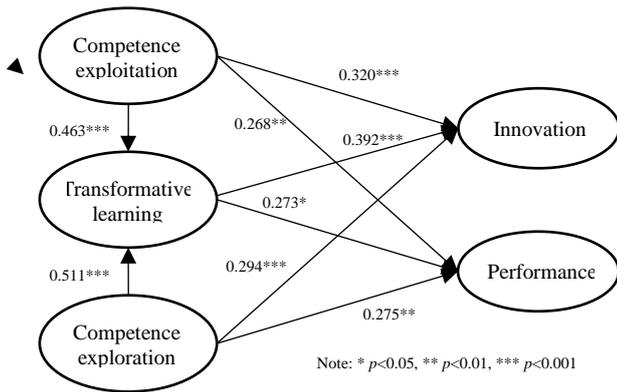


Fig. 1 The research model

An empirical study of the service innovation in Taiwan found that the effects of competence exploitation, competence exploration, and transformative learning were significant for innovation. The path coefficients were 0.320 ($p<0.001$), 0.294 ($p<0.001$), and 0.392 ($p<0.001$), respectively.

Hypotheses 1, 2, and 3 of this study were supported. Next, the effects of competence exploitation, competence exploration, and transformative learning were significant for performance. The path coefficients were 0.268 ($p<0.005$), 0.275 ($p<0.004$), and 0.273 ($p<0.016$), respectively. Hypotheses 4, 5, and 6 of this study were supported, respectively. Finally, the effects of competence exploitation and competence exploration were significant for transformative learning. The path coefficient was 0.463 ($p<0.001$) and 0.511 ($p<0.001$). Therefore, hypothesis 7 and 8 was also supported.

Table 3 Results of hypothesis testing

Hypotheses	Relationship	Path	p-value	Results
H1	CEi → IN	0.320	0.001	supported
H2	CEr → IN	0.294	0.001	supported
H3	TL → IN	0.392	0.001	supported
H4	CEi → PM	0.268	0.005	supported
H5	CEr → PM	0.275	0.004	supported
H6	TL → PM	0.273	0.016	supported
H7	CEi → TL	0.463	0.001	supported
H8	CEr → TL	0.511	0.001	supported

Table 4 Impacts of variables

Variables	Direct impact		Indirect impact		Total impact	
	IN	PM	IN	PM	IN	PM
CEi	0.320	0.268	0.181	0.126	0.501	0.394
CEr	0.294	0.275	0.200	0.140	0.494	0.415
TL	0.392	0.273	-	-	0.392	0.273

Note: CEi=Competence Exploitation; CEr=Competence Exploration; TL=Transformative Learning; IN=Innovation; PM=Performance.

This study analyzes the effects of each antecedent on innovation and performance (Table 4), including direct and indirect effects. Among all of the antecedents of innovation in the service, the total effect of competence exploitation has the greatest effect (0.501) on innovation, including direct effect (0.320) and indirect effect (0.181), respectively. Next, the total effect of competence exploration has the greatest effect (0.415) on performance, including direct effect (0.275) and indirect effect (0.140), respectively. The results show that competence exploitation and competence exploration have the greatest effect on service innovation in the service.

5. Conclusions and Discussion

This study gathered data on service in Taiwan to understand the effects of the service innovation, and conducted theoretical and practical discussion of research results. First, the outcome of the analysis described above demonstrates that competence exploitation, competence exploration, and transformative learning each has significant and positive effect both on innovation and performance. This result corresponds to the concept of “absorptive capacity” advocated by Lichtenhaler (2009). Apart from proving that innovative capacity is an important factor in the development of innovation and adaptation to varying business environments, this result also reveals that transformative learning has significant explanatory power with regard to organizational performance. This study also shows that competence exploitation and competence exploration has significant and positive effect on transformative learning, respectively. This complies with the conceptual model proposed by Hurley and Hult (1998) and matches some

aspects of the organizational learning mechanism proposed by Bell, Whitwell, and Lukas (2002).

Secondly, many studies on innovation management promote the viewpoint that learning orientation positively contributes to firm performance. This study found that with regard to service, transformative learning plays an important role both in innovation and performance. The service industry has implicit subsequent costs (Anderson, Fornell, & Rust, 1997), which indicates that apart from promoting the development of knowledge as a method of influencing behavior, firms should also emphasize innovative development and explorative capacity. Transformative learning has direct effect both on innovation and performance; these results echo the concept of “absorptive capacity”, which is a point of particular emphasis in the service industry.

Thirdly, most services are intangible, heterogeneous, and inseparable (Parasuraman, Zeithaml, & Berry, 1985). Services need a flexible organizational learning to avoid the capability-rigidity. This study verifies the service innovation in Taiwan show that transformative learning has significant and positive effect both on innovation and performance in service industries. Although previous studies have mainly emphasized manufacturing industries, this study showed that elements of innovative capacity (including competence exploitation and competence exploration) are antecedents of transformative learning. The effect of competence exploitation on innovation is the largest, and the effect of competence exploration on performance is the largest. Transformative learning plays an important mediating role in enhancing both innovation and performance.

5.1. Limitations and Future Research

The results of this study may have the following bias. First, this paper conducted an empirical study of the service industries in Taiwan, by mailing questionnaires to conduct surveys of firms. Due to limited time, budget, and limited number of replies, the study results may not be generalizable for use in other industries or countries. Future studies could analyze other industries or countries to make the results more generalization. Second, the relationship of both competence exploitation and competence exploration on performance may differ in economic or competitive environments in service firms, and this study did not consider these environmental factors. Future studies could also integrate political, economic, legal, and industrial factors. Third, future empirical studies could examine the relative contribution of innovative capacity on the firm's competitive advantage. Factors such as innovativeness, capacity to innovate, learning orientation, and market orientation are all known to affect a firm's competitive advantage (Hult & Ketchen, 2001; Hurley & Hult, 1998). Fourth, transformative learning is an important mediator for achieving innovation and performance on service firm. Future studies can continue to develop relations with the high-level learning process. Fifth, this study was a cross-sectional research and future studies can use a longitudinal method to observe the long-term relationships among variables.

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