

The Impact of Information and Strategic Planning Capabilities on Logistics Performance and Competitiveness

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Key Words: information capability, strategic planning, resource based theory, logistics performance, competitive advantage, structural equation modelling

Abstract

This paper aims to explore the strategic roles of information and strategic planning capabilities for firms' performance, and to examine the direct and indirect relationships between information capability, strategic planning capability, logistics performance and competitive advantage. The present research adopts resource based theory (RBT) to explore the relationships between a firm's specific capability and its performance and employs structural equation modelling (SEM) in order to test the validation of the measurement models and examine the relationships between construct variables. The current empirical test was conducted using the data collected from logistics managers of 101 Korean electronics companies. The empirical research presents positive influential relationships between (1) information/planning formality capability and strategic planning capability; (2) strategic planning capability and logistics performance; (3) logistics performance and competitive advantage; and (4) competitive advantage and competitive position in the market.

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I. Introduction

It has been recognized that information capability is critical to achieving business success and long-term survival. This is a result of the emergence of an information-based society, influencing nearly every aspect of commercial activity, including the logistics function (Roger *et al.*, 1996). Meanwhile, the importance of a firm's strategic planning capability has been accepted as it could provide the direction of the organization and actions necessary to improve its performance (O'Regan and Ghobadian, 2002). Therefore, it is worthwhile exploring the strategic role of information and strategic planning capabilities for firms' performance, and examining the direct and indirect relationships between information and strategic planning capabilities and firm performance including logistics performance and competitive advantage.

This paper proposes Resource Based Theory (RBT) as the theoretical base to explore the relationships between a firm's information and strategic planning capabilities and its performance. RBT assumes that firms within an industry are heterogeneous with respect to the strategic resources they control and that such resources are not completely mobile across firms. According to Mentzer *et al.* (2004), heterogeneity of resources acts as a source of competitive advantage for firms since they are not completely imitable for competing firms. From an RBT viewpoint, information capability and strategic planning capability can be understood as critical capabilities of the firm, which makes it differ from its competitors and effectively achieve and maintain competitive advantage.

The remainder of this paper is structured as follows. The next section contains a literature review of the four main areas of interest. Section three presents the research model and hypotheses while section four deals with the questionnaire design and responses. The fifth section presents the empirical analysis and the results. The final section draws some conclusions.

II. Literature Review

This section concentrates on the literature review for the four latent variables

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employed in the current empirical research, which are information capability, strategic planning capability, logistics performance and competitive advantage.

1. Information Capability

"Increasingly, it seems that successful companies have one thing in common – their use of information and information technology ... Information has always been central to the efficient management of logistics but now, enabled by technology, it is providing the driving force for competitive logistics strategy" (Christopher, 1998). Information technology expedites internal integration within an organization as well as external value chain linkage management with trading partners (Porter and Millar, 1985). If compatible information technology exists among supply chain members it enhances communication, reduces risk and supports the efficient transfer of information. In this view, an efficient flow of information can support the development of a sustainable competitive advantage (Hoyt and Huq, 2000).

Information capability consists of two main components: information technology and information sharing. As cited in Williams *et al.* (1997), Sharp (1989) suggested that better and faster information control might lead to a strategic and competitive advantage for all parties involved with the ultimate result: this makes a firm provide better service to end-customers. In addition, management information systems are allowing the effective integration of decision making across firms as well as the introduction of new approaches, such as just-in-time supply management (Chow *et al.*, 1995). Therefore, the advances in information technology can lead to both suppliers and buyers being more cost, product and process efficient, which means a given channel can lead to them having an advantage over competitors.

Second, information sharing can be defined as "the willingness to make strategic and tactical data available to other members of the supply chain" (Bowersox *et al.*, 1995). Emphasizing customer-firm relations, Daugherty *et al.* (1992, 1994) has asserted that sharing information makes a firm more responsive to customer requests and builds greater customer loyalty and better customer-firm relations. According to this work, an examination of firms that have gained competitive advantage through 'individualized, but cost effective response programs' emphasized the critical role of information sharing. Cooper *et al.* (1997) has pointed out that one of the ingredients to the implementation of logistics and SCM is information sharing through two-way

communication between partners within a supply chain. Mentzer *et al.* (2001) have also stated that open sharing of information such as inventory levels, forecasts, sales promotion strategies, and marketing strategies lowers the uncertainty between supply chain partners and leads to enhanced performance. Bowersox *et al.* (1999) has posited that information sharing is of greater importance than IT as without the existence of a cooperative spirit among firms regarding information sharing, the arrangement will fail whether or not the technology is available.

Together with information technology and information sharing, the current research includes additional components for information capability namely information contents for strategy, manufacturing and logistics since the availability of robust manufacturing and logistics information is critical in logistics and supply chain operations (Fawcett *et al.*, 2000).

2. Strategic Planning Capability

Strategic planning can be defined as "the direction and scope of a company over the long term, which achieves advantage for the company through its configuration of resources within a changing environment, to meet the needs of markets and to fulfil stakeholder expectations" (Johnson and Scholes, 1997). According to Hayes *et al.* (1988), strategic planning should lead the firm to arrange its resources in a manner which reinforces the priorities that a company has placed on certain competitive dimensions (cited in Fawcett *et al.*, 1996). Hewlett (1999) has noted that "a strategic plan and the strategic planning process itself offers a competitive edge and enables a company to measure achievements against expectations."

Strategic planning is composed of strategy formality and strategy process or implementation. Formality can be defined as "incorporating an extensive analysis of risks and benefits, documentation of alternatives, and communication of the firm's objectives and strategy implementation process to all relevant management levels" (Fawcett *et al.*, 1996). In the literature, formal strategic planning is described as requiring an explicit process for determining the firm's long-range objectives, procedures for generating and evaluating alternative strategies, and a system for monitoring the results of the plan when implemented (Armstrong, 1982).

However, a sophisticated approach to planning is only one step on the way to improved performance (Hahn and Powers, 1999). Once all planning is completed, the

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senior management of the company must take the lead in translating strategies and goals into a business plan (Hewlett, 1999) because, without successful implementation, a strategy is only a fantasy (Hambrick and Cannella, 1989). According to O'Regan and Ghobadian (2002), strategic planning process has the following benefits: (1) strategic planning is involved in the corporate agenda; (2) strategic planning is approached in a systematic manner; and (3) the strategic planning process increases staff awareness and enhances participation in the strategic plan.

Together with formality and process, the present research takes into account the coordinated strategy development among functional areas i.e. strategic planning sharing to emphasize the importance of planning capability to make possible an integrated operations.

3. Logistics Performance

Defining performance is a challenge for researchers in management fields since organizations have multiple and frequently conflicting goals (Chow *et al.*, 1994; Rogers *et al.*, 1996). However, logistics or distribution service performance can be viewed as a subset of the firm or organizational performance although there is no 'one best way' of defining organizational performance itself (Chow *et al.*, 1994; Ellinger *et al.*, 2000).

A wealth of research has suggested various dimensions to capture the concept of logistics performance. These include effectiveness, efficiency, quality, productivity, innovation, profitability, on-time delivery, quick response, customer satisfaction, flexibility, zero damage, etc. Sink *et al.* (1984) have suggested the following seven dimensions of performance: effectiveness, efficiency, quality, productivity, quality of work life, innovation and profitability/budgetability. Rhea and Shrock (1987a, b) identified six key elements of logistics distribution effectiveness, namely adequacy, consistency, accuracy, timeliness, initiative and responsiveness. Chow *et al.* (1994) have defined logistics performance as the extent to which goals such as cost efficiency, profitability, social responsibility, on-time delivery, sales growth, job security and working conditions, customer satisfaction, product availability, keeping promise, low loss and damage, fair prices for inputs and flexibility are achieved. It incorporates various possible dimensions of performance in a single envelope to help highlight the goals.

The present study proposes that logistics performance could be measured by the following three categories focusing on the real logistical activities: (1) reliability; (2) responsiveness and (3) innovativeness. This categorization is based on a suggestion from Andraski and Novack (1996). The authors have pointed out that a traditional logistics service such as order fill, on-time delivery, zero damage and accurate invoicing can be called a 'reliability' service and an evolving logistics service such as customer pick-up options and special material handling options can be called a 'responsiveness' service. In addition, they label the ultimate logistics service including quick response, just-in-time management, pre-notification of delivery delays or product shortage, and category management as an 'innovation' service.

4. Competitive Advantage

Competitive advantage is often defined as a positional advantage gained by a firm which, in contrast to the competition, provides customers with the lowest cost or perceived uniqueness (Porter, 1985). Hayes *et al.* (1988) identified the following five performance criteria for a firm to seek competitive advantage: cost, quality, dependability, flexibility and innovation. Scannell *et al.* (2000) have noted that effective logistics management can exert positive influences on cost, quality, flexibility, and innovation performance. In this conception, cost and quality are traditional major strategic factors for cost leadership and differentiation.

However, in the recent strategic management research, cost and quality are recognised as minimum requirements for the measurement of competitiveness. In contrast, flexibility has received increasing attention as a viable differentiator especially under the context of time-based competition (Fawcett *et al.*, 1996). Regarding innovation, Porter (1997) has suggested that the only way to obtain competitive advantage is through innovation and improvement.

As the indices of competitive advantage, the current model proposes four competitive dimensions such as cost, quality, flexibility and innovativeness. In the current study, in order to collect more objective data, firms' competitive position indices presented in the market place such as market share, sales growth rate, and growth rate of the industry are also included.

III. Research Model and Hypotheses

This study aims to examine the influential relationships between information and strategic planning capabilities, logistics performance and competitive advantage. These relationships can be formulated more clearly by the following three hypotheses.

H1: Information capability has a positive influence on strategic planning capability, logistics performance and competitive advantage.

The firm's ability to capture information for use in the planning process is critical to selecting and developing suitable capabilities (Fawcett *et al.*, 2000). Similarly, Akers and Porter (1995) have asserted that information is the key to successful strategic planning. According to Rogers *et al.* (1996), the information capability is significant only when it is utilized effectively for improved decision making. Meanwhile, the utilization of logistics information technology is considered essential to satisfy the strategic goals of organizations. Gustin *et al.* (1995) has asserted that information capability is not only critical to support effective customer service strategies but is also essential in the support of internal firm operations. According to Fawcett *et al.* (2000), the successful management of worldwide operations for competitive advantage is restrained without useful information.

H2: Strategic planning capability has a positive influence on logistics performance and competitive advantage.

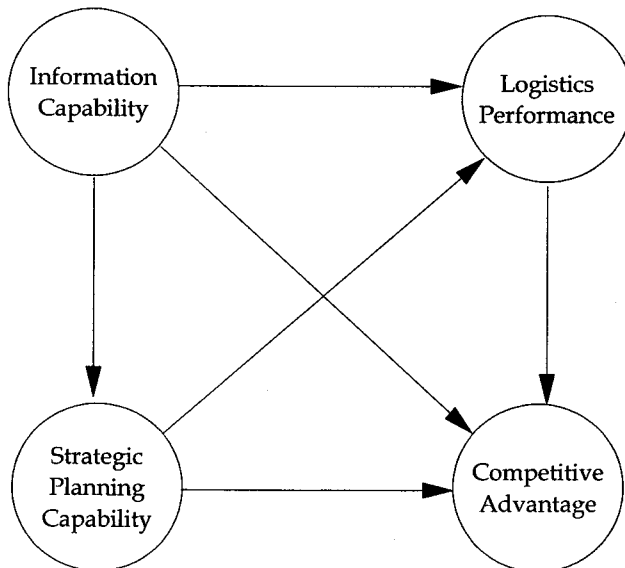
Bowersox *et al.* (1989) have placed great importance on the linkage between the strategic planning process and the development of logistics capabilities. For such authors, strategic planning of the logistics and supply chain is a critical decision problem, which has a bearing on the long-term survival and prosperity of companies in the manufacturing, retail, and other industrial sectors (Koutsoukis *et al.* 2000). Meanwhile, the existing empirical studies (Robertson *et al.*, 1993; Miller and Cardinal, 1994; O'Regan and Ghobadian, 2002; Frederickson and Mitchell, 1984; Mintzberg, 1993; 1994; Hahn and Powers, 1999) have shown mixed results for the relationships between strategic planning and various organizational performance. However, this paper

assumes that strategic planning capability can exert a significant positive impact on the firm's performance and competitive advantage.

H3: Superior logistics performance exerts positive influences on firms' competitive advantage.

Lambert and Stock (1993) have asserted that logistics distinctive capability can be a scarce resource and that logistics systems are much harder to copy or adjust to than changes in price, promotion or product tactics. For example, Wal-Mart's point-of-purchase inventory control systems and cross-docking distribution plants have resulted in competitive advantage over its major competitor, K-Mart (Barney, 1995). As firms become less hierarchical, as they more geographically dispersed, and as customers become more demanding, logistics is able to provide a coordinating role, which can provide a firm with a competitive advantage (Stock *et al.*, 1999).

The hypothesized relationships among the latent variables are presented in Figure 1 below.



<Figure 1> Hypothesized relationships between constructs

IV. Questionnaire Design and Responses

The current study adopted a postal questionnaire survey to the electronics industry of Korea for the following two reasons. First, the electronics industry mainly produce standardized commodities, which are virtually similar regardless of manufacturers worldwide (Dicken, 1998; 2003), that means an effective and unique logistics and supply chain management could function as a critical determinant of a firm's competitiveness. Second, the electronics industry is a representative industry of Korea and has increased their market shares in the world market. For instance, the world market shares of selected commodities were around 3.4% to 7.4% in the electronics industry in 2001.

<Table 1> Korea's share in selected commodities of the world exports

Unit: Million US dollars

Year	World (A)		Korea (B)		Share (B/A, %)	
	2000	2001	2000	2001	2000	2001
Computer Equip.	172,498	161,684	9,291	7,485	5.4	4.6
TV Sets	26,684	27,170	1,582	1,546	5.9	5.7
Radio Receivers	15,448	12,935	565	441	3.7	3.4
Sound/TV Recorders	24,533	23,354	1,716	1,684	7.0	7.2
Telecomm. Equip.	200,829	182,747	10,500	12,273	5.2	6.7
Transistor	262,534	198,768	24,688	14,742	9.4	7.4

Source: Korea International Trade Association, UN, International Trade Statistics Yearbook

The hypotheses were tested on 1,213 electronics companies selected from company lists provided by the Korea Chamber of Commerce and Industry, Korea Electrical Manufacturers Association and Electronic Industries Association of Korea. These firms were selected from a total of 11,550 companies. The main selection criterion is whether a certain firm is a share-listed company on the Korean stock market or KOSDAQ market.

The main form of response adopted in this study is closed format using the Likert scale technique. In order to measure information and strategic planning capabilities, respondents were asked to indicate one scale from 1 (strongly disagree) to 7 (strongly

agree). Similarly, regarding performance measurement, respondents were asked to provide a seven-point rating compared to its major competitors from 1 (much worse) to 7 (much better). In addition, the measurement scales include the 'not available/applicable' option. All the measured items are shown in the Appendix.

The survey was conducted over about 2 months, commencing in late June until mid-August 2004. The survey instruments were mailed to the potential respondents of 1,213 firms with a cover letter and two letters of recommendation explaining the aim and purpose of the study and assuring respondents of the confidentiality of their responses and anonymity. A postage paid return envelope was included with each questionnaire. 126 questionnaires were returned due to non-delivery; specifically, many companies had moved their offices or factories or shut down in some cases. One of the 102 returned questionnaires was discarded since the respondents had put the same answers on all the seven-point Likert scale items. The total response rate was 9.29% (101/1,087) and assumed to be an acceptable level compared to the previous empirical studies such as Fawcett and Magnan (2002: 11%), Stank *et al.* (2002: 12%), Stock *et al.* (2000: 7.5%) and Rabinovich *et al.* (1999: 4.3%).

In order to check potential non-response bias, the last quartile of respondents was compared to the first quartile of respondents as suggested by Armstrong and Overton (1977) and Lambert and Harrington (1990). The results show that most assessments yielded no statistically significant differences ($P > 0.05$) between the two groups. Therefore, it was assumed that respondents did not differ from non-respondents and thus non-response bias was not an issue in this study. Table 2 is the demographic characteristics of the 101 firms.

The sample showed that, 38.6% of respondents had worked for more than 9 years and 16.8% had worked for more than 15 years for their present companies. Regarding company information, the respondents were commonly asked to indicate their company age, total sales value, number of full time employees. First, 68.3% of the sample industry had been in operation for more than 12 years and 37.6% had been operating for more than 20 years. Second, 36.6% of the sample industry had total sales value below 25 billion Korean Won, 50.5% companies had recorded total sales value between 25 and 250 billion Korean Won and 12.9% firms had total sales value of over 250 billion Korean Won in 2003. Third, it was also identified that 29.0% of the firms had 100 or fewer employees, 50.0% of the companies employed between 101 and 500 workers, 14.0% of the firms had 501 to 1,000 employees and 7.0% of the

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firms employed more than 1,000 full time workers in 2004.

<Table 2> General Profiles of Respondents and Respondents Companies

Work experience in the company		Company age		Total sales value		Number of full time employees	
Years	Percent	Years	Percent	KW Billion	Percent	Numbers	Percent
1-3	28.7	< 5	9.9	< 1.0	1.0	< 100	29.0*
4-6	22.8	5-8	9.9	1.0-5.0	7.9	101-300	40.0*
7-9	9.9	9-12	11.9	5.1-10.0	8.9	301-500	10.0*
10-12	8.9	13-16	13.9	10.1-25.0	18.8	501-1000	14.0*
13-15	12.9	17-20	16.8	25.1-50.0	17.8	1,001-2,000	1.0*
16-18	8.9	> 20	37.6	50.1-100.0	15.8	> 2,000	6.0*
19-21	4.0			100.1-250.0	16.8		
22-24	2.0			250.1-500.0	6.9		
25-27	2.0			> 500.0	5.9		
Sum	100.0	Sum	100.0	Sum	100.0	Sum	100.0*

Note: * means valid percent due to one missing data

V. Empirical Analysis and Results

The current research adopts structural equation modelling (SEM), which is composed of two components, namely, the measurement model and the structural model (Garver and Mentzer, 1999; Hair *et al.*, 1998). The measurement model specifies the relationships between the observed variables and the latent (i.e. unobserved) variables, while the structural model specifies the hypothesized causal relationships among the latent variables (Byrne, 2001; Kline, 1998; Koufteros, 1999; Maruyama, 1998).

1. Item and Scale Purification: Exploratory Factor Analysis

Exploratory factor analysis (EFA) was employed to determine how and to what extent the observed variables are linked to their underlying factors: 14 observed variables for information and strategic planning capabilities and 15 indices

representing logistics performance and competitive advantage.

Principle components analysis was adopted for identifying the minimal number of factors that underlie co-variation among the observed variables. First, EFA of the information and strategic planning capabilities identified two latent variables, which were labelled as 'Information and Planning Formality (IPF)' and 'Strategic Planning (SP)'. Second, through the EFA of performance indices three latent variables were identified and labelled as 'Logistics Performance (LP)', 'Competitive Advantage (CA)' and 'Competitive Market Position (CMP)'.¹⁾

<Table 3> Exploratory factor analysis of information/strategic planning capability and competitive advantage

Latent Variables	Observed Variables	Component		Latent Variables	Observed Variables	Component	
		1	2			1	2
Information and Planning Formality (IPF)	IC2	0.836		Competitive Advantage (CA)	INNOV2	0.866	
	IC1	0.831			INNOV1	0.823	
	IS2	0.819			QUAL2	0.802	
	IT2	0.749			FLEX1	0.758	
	IC3	0.734			LMC	0.740	
	SPF1	0.670			FLEX2	0.734	
	IT1	0.670			QUAL1	0.720	
	IS1	0.604		Competitive Market Position (CMP)	SGRC		0.908
SPF2	0.604		SGRM			0.883	
			MS			0.621	
Strategic Planning (SP)	SPP3		0.813				
	SPP2		0.795				
	SPP1		0.718				
	SPS1		0.623				
	SPS2		0.570				
Eigenvalues		7.836	1.285	Eigenvalues		6.243	1.018
Percent of Variance		55.970	9.176	Percent of Variance		62.426	10.183
Cumulative Percent		55.970	65.146	Cumulative Percent		62.426	72.610
KMO Measure		0.902		KMO Measure		0.877	

1) Only one component was extracted for logistics performance.

2. Measurement Model: Validity and Reliability

In order to confirm the validity and reliability of the measurement models, confirmatory factor analysis (CFA) technique were adopted to (1) two-factor model composed of 'Information and Planning Formality (IPF)' and 'Strategic Planning (SP)' and (2) three-factor model composed of 'Logistics Performance (LP)', 'Competitive Advantage (CA)' and 'Competitive Market Position (CMP)'. The minimum requirements for model identification were satisfied for the two models.²⁾

Notably, 'a decision making process based on total cost measurement (SPP1)' index of strategic planning, 'lower manufacturing cost (LMC)' item of competitive advantage and 'JIT management (INNO2)' index of the logistics performance were deleted due to their low factor loadings less than 0.7. Except for these items, all the factor loadings are greater than 0.7 and their t-values are significant at 0.001 level. In addition, the criteria of fit indices are marginally satisfied (for the first model CFI = 0.910, TLI = 0.884, RMSEA = 0.116; and for the second model CFI = 0.939, TLI = 0.923, RMSEA = 0.103). Therefore, unidimensionality and convergent validity are satisfied.

Reliability can be assessed by Cronbach's alpha, construct reliability and variance extracted. The reliability is verified since the values of Cronbach's alpha for the factors are larger than 0.8 and all the values of construct reliability are greater than 0.7 and, in addition, all the values of variance extracted are greater than 0.5 (See Table 4).

<Table 4> Assessment of reliability of information and strategic planning capabilities and performance

Capabilities and Performance		Cronbach's Alpha	Construct Reliability	Variance Extracted
Capabilities	Information/Planning Formality (IPF)	0.917	0.950	0.583
	Strategic Planning (SP)	0.883	0.833	0.556
Performance	Logistics Performance (LP)	0.903	0.905	0.707
	Competitive Advantage (CA)	0.926	0.868	0.690
	Competitive Market Position (CMP)	0.854	0.896	0.589

Finally, concerning discriminant validity, most of the correlation coefficients among

2) It is theoretically possible to calculate a unique estimate of every one of its parameters.

the six latent constructs do not exceed the cut-off point of 0.85 suggested by Kline (1998), which means that the discriminant validity among the factors examined in this study is initially supported.

In summary, the CFA approach demonstrated that the measurement models satisfied the issues of validity and reliability, i.e. unidimensionality, convergent validity, reliability and discriminant validity.

3. Full Structural Model

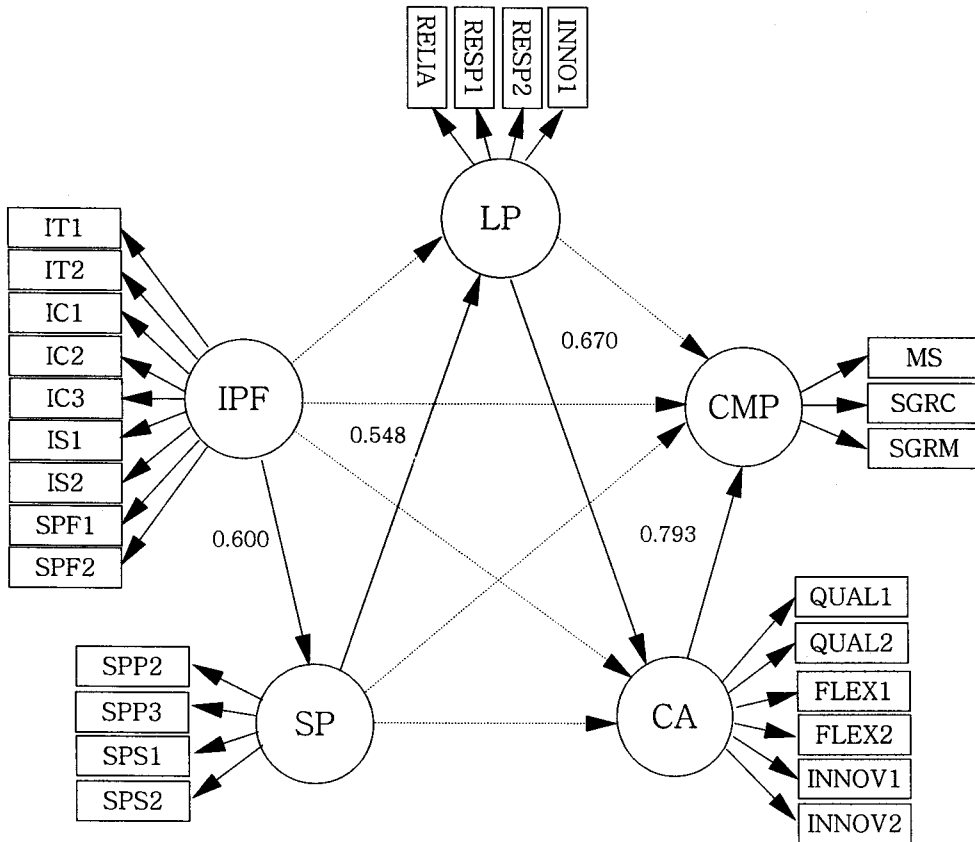
Before the main analysis, it should be noted that 10 competitive advantage items were categorized into two constructs (i.e. Competitive Advantage and Competitive Market Position) through EFA and confirmed by CFA in the previous section. Therefore, the three hypotheses initially proposed were adjusted to involve the new relationships caused by these constructs. One important point is that it was assumed that the competitive advantage might be revealed by their competitive position in the market places. The revised hypotheses are as followings:

- H1: Information capability has a positive influence on strategic planning capability, logistics performance, competitive advantage and competitive position in the market
- H2: Strategic planning capability has a positive influence on logistics performance, competitive advantage and competitive position in the market
- H3: Superior logistics performance exerts positive influences on firms' competitive advantage and competitive position in the market
- H4: Competitive advantage has a positive influence on competitive position in the market.

The minimum requirements for model identification were satisfied and the fit indices ($\chi^2/df = 1.688$, CFI = 0.903, TLI = 0.890, RMSEA = 0.083) are acceptable. Among the 10 causal paths specified in the hypothesized model, the 4 hypothesized paths (IPF \rightarrow SP; SP \rightarrow LP; LP \rightarrow CA; CA \rightarrow CMP) were found to be statistically significant; however, the other 6 hypothesized paths (IPF \rightarrow LP; IPF \rightarrow CA; IPF \rightarrow

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CMP; SP → CA; SP → CMP; LP → CMP) appeared to be insignificant. The full structural equation model is presented in Figure 2.



<Figure 2> Full structural model and significant coefficients (solid lines)

4. Hypothesis test results

Hypothesis one is partially supported because there are statistically significant positive relationship between IPF and SP; however no significant direct relationship exists between IPF and LP, IPF and CA, and between IPF and CMP. This result implies that a firm's information capability and formal strategic planning system is central to successful strategic planning (Akers and Porter, 1995). Therefore, Korean

electronics firms should effectively utilize the information capability for improved strategic decision making. Meanwhile, information capability exerts just indirect influence on logistics performance and firm's competitiveness through strategic planning capability. For instance, the information and planning formality gives indirect influence on logistics performance ($IPF \rightarrow SP \rightarrow LP$), competitive advantage ($IPF \rightarrow SP \rightarrow LP \rightarrow CA$) and on competitive position in the market place ($IPF \rightarrow SP \rightarrow LP \rightarrow CA \rightarrow CMP$) through the three different paths. This result means the information system design and information contents should be improved to provide the 'readily available' information for logistical operations and competitiveness management.

Hypothesis two is partially supported since SP exerts a significant positive influence on LP but not on CA and CMP. This result means that a superior logistics performance is greatly supported when logistics management is combined and coordinated by strategic planning capability. Concerning the relationship between strategic planning and performance, as mentioned in the third section, many previous empirical research shows a mixed picture. Likewise, the current empirical study presents the strategic planning capability has a significant direct influence upon logistics performance only and not upon competitiveness factors; however, the strategic planning gives significant indirect influence on competitive advantage and competitive position in the market through the logistics performance construct.

Hypothesis three is also partially supported because it appears that LP has a significant positive effect upon only CA constructs but not upon CMP; however similar to the information and strategic planning cases, prevalent logistics performance or capability exerts a significant indirect impact on competitive position in the market place through competitive advantage construct. This result implies that electronics companies should consider the strategic importance of logistical capability when they build and cumulate the competitiveness factors, and they design and implement a long-term growth plan.

Finally, hypothesis four is fully supported since CMP is significantly predicted by its CA. This relationship implies that the company pursuing superior quality in manufacturing and design, flexibility in logistics and operations, and innovation of product and process could successfully realize dominant market share and continual growth.

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<Table 5> The parameter estimates of the proposed structural equation model

Construct Variables		Estimate	t-value
SP(Strategic Planning)	← IPF(Information/Planning Formality)	0.600 (0.816)	7.192**
LP(Logistics Performance)	← IPF(Information/Planning Formality)	-0.057 (-0.079)	-0.353
LP(Logistics Performance)	← SP(Strategic Planning)	0.548 (0.555)	2.305*
CA(Competitive Advantage)	← IPF(Information/Planning Formality)	-0.043 (-0.061)	-0.398
CA(Competitive Advantage)	← SP(Strategic Planning)	0.291 (0.305)	1.713
CA(Competitive Advantage)	← LP(Logistics Performance)	0.670 (0.694)	6.718**
CMP(Competitive Market Position)	← IPF(Information/Planning Formality)	0.165 (0.224)	1.206
CMP(Competitive Market Position)	← SP(Strategic Planning)	0.017 (0.017)	0.078
CMP(Competitive Market Position)	← LP(Logistics Performance)	-0.196 (-0.193)	-1.149
CMP(Competitive Market Position)	← CA(Competitive Advantage)	0.793 (0.753)	3.536**

Note1: ** Significant at $p < 0.01$ ($t = \pm 2.57$) * Significant at $p < 0.05$ ($t = \pm 1.96$)

Note2: The figures in the parentheses mean standardized regression weights.

VI. Conclusion

This paper intends to provide an insights into the role of information capability and strategic planning capability on logistics performance and firms' competitiveness. The present research has employed resource based theory and has established research hypotheses and subsequently provided useful explanations of the firm's strategic behaviors and its influences.

This research shows that information and planning formality capability has a significant positive influence on strategic planning capability; and sequentially strategic planning capability exerts significant positive influence on logistics performance. In addition, information and strategic planning capabilities have significant indirect influences on competitive advantage and competitive market position through various paths linking the constructs. Those findings suggest that manufacturing firms, especially electronics companies should improve their information and strategic planning capabilities to establish and maintain a high level of logistics capability and

performance, and furthermore the firm's competitiveness.

In addition, the research shows that the electronics firm possessing high level of logistics performance or capability could achieve competitiveness and sequentially presents rapid growth rate and high market share. Therefore, it can be proposed that the manufacturing firms should recognize the strategic value of logistics and supply chain management and should make efforts to build a more reliable, responsive and innovative logistics capability.

In summary, the information and strategic planning capabilities could function as critical strategic assets to accomplish superior logistics performance, competitive advantage and competitive position in the market place. In addition, the empirical results recommend that a firm should make efforts to build a superior logistics capability in order to effectively obtain and/or reinforce its competitive market position and long-term success.

Concerning the limitations and future research issues, most of all, the current study uses only on sample industry in Korea, which means it would be difficult to generalize the results and to adopt the implications to other industries or other countries without careful consideration. Therefore, an ethnographical research including more than 2 countries with various industries could be an interesting issue for further study. Meanwhile, the present research targets the information and strategic planning capabilities of manufacturing companies only. Therefore, it would be interesting to explore the case of transport or logistics companies, for instance, the impact of logistics service providers' information and strategic planning capabilities upon their performance areas and/or the logistics service customer's performance.

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Appendix

Construct	Observation variable	Mean	SD
Information and Planning Formality (IPF)	• Continual investments in IT (IT1)	4.17	1.70
	• Tailored information system for SCM (IT2)	4.19	1.57
	• Usefulness of strategy-related information (IC1)	3.67	1.57
	• Usefulness of production related information (IC2)	3.65	1.63
	• Usefulness of logistics related information (IC3)	3.91	1.68
	• Design of information system for the information sharing between departments (IS1)	4.29	1.58
	• Design of information system for the information sharing with suppliers/customers (IS2)	3.63	1.63
	• A formal planning system for the design of operating system (SPF1)	4.00	1.61
	• A formal evaluation system for financial and logistical Performance (SPF2)	3.97	1.64
Strategic Planning (SP)	• A decision making process based on total cost measurement (SPP1)	4.73	1.34
	• A continual planning process incorporating feedback (SPP2)	4.64	1.28
	• Planning process evaluating environmental constraints, firm resources and organizational goals (SPP3)	4.71	1.39
	• Participation of all functional staff in strategy development (SPS1)	4.41	1.42
	• Integration of logistics strategy with other strategic plan (SPS2)	3.93	1.37
Logistics Performance (LP)	• Meeting accurately quoted or anticipated delivery dates and quantities on a consistent basis (Reliability) (RELIA)	5.04	1.12
	• Responding promptly to the needs and wants of key customers (RESP1)	5.20	1.09
	• Being flexible in terms of accommodating customers' special requests (RESP2)	5.27	1.10
	• Notifying customers in advance of delivery delays or product shortages (Pre-notification) (INNO1)	5.24	1.20
	• Utilizing just-in-time management (INNO2)	4.82	1.40
Competitive Advantage (CA)	• Lower manufacturing cost (LMC)	4.60	1.44
	• Meeting customer's expectation for manufacturing quality (QUAL1)	5.09	1.11
	• Meeting customer's expectation for design quality (QUAL2)	5.02	1.33
	• Flexibility in production volume, changeover, modification (FLEX1)	5.14	1.23
	• Ability to deal with unexpected events (FLEX2)	5.20	1.18
	• Product innovation level in the product (INNOV1)	4.88	1.27
	• Process innovation level in the product (INNOV2)	4.85	1.31
Competitive Market Position (CMP)	• Market share (MS)	4.73	1.42
	• Sales growth rate compared to competitors (SGRC)	4.80	1.34
	• Sales growth rate compared to market growth rate (SGRM)	4.67	1.37

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