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Factors Affecting Logistics Capabilities for Logistics Service Providers: A Case Study in Vietnam

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Abstract

This study aimed to investigate the factors affecting Logistics capabilities for Logistics Service Providers in Vietnam. Researchers inherited and developed based on previous research to focus on analyzing and evaluating dynamics, measuring Logistics capabilities, and the factors affecting Logistics capabilities for Logistics Service Providers. The logistics capabilities Model is used based on three factors: customer demand management capability, innovation capability, and information management capability. The empirical analysis used data from the survey data of 190 managers of Logistics Service Providers in Hai Phong, Ho Chi Minh City, Da Nang, Hue, Hanoi with reliable tools (SPSS 26.0 software). The data were analyzed by frequencies, percentages, means, Pearson's Linear Correlation Coefficient, exploratory factor analysis, and multi-linear regression model based on the survey data. The research results identified the following factors affecting Logistics capabilities for Logistics Service Providers: innovation capability has the strongest impact on Logistics capabilities; customer demand management capability has the following strong effects on Logistics capabilities; and finally, information management capability that affects Logistics capabilities. There is also a positive relationship between all factors and Logistics capabilities. Several recommendations are further suggested to enhance to improve Logistics capabilities for Logistics Service Providers in Vietnam.

Keywords: Logistics Service Provider, Logistics Capabilities, Exploratory Factor Analysis Financial

JEL Classification Code: C30, P17, P33

1. Introduction

Capability is understood as a complex bundle of skills and accumulated knowledge, exercised through organizational processes. Capabilities will enable firms to coordinate activities and make use of their assets (Day, 1994). According to Hafeez et al. (2002) stated that capability is the ability to use resources to perform tasks or activities; it is defined as a resource that tangible or intangible owned or acquired by an enterprise. Mentzer et al. (2004) argued that the result of an enterprise's service provision process is to create value to meet the highest level of customer needs. This is the core factor that helps businesses create competitive advantages, achieve profits in the long term, and survive and thrive in the current fierce competition context. Each enterprise has different resources, and the ability to convert resources into a capacity to create products/services provided to customers is also different. For Logistics Service Provider (LSPs), logistics capacity is service provision capacity. Products provided to the market of LSPs are logistics services, and

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customers' requirements for LSPs often focus on full services logistics, on time, ensuring safety, and correct products, ensuring flexibility, and responding to unexpected requests that occur. Therefore, an assessment of logistics capacity is an assessment of a logistic enterprise's service provision capacity. The higher the service provision capacity of a business, the more cost-effective it is for the service user. Therefore, improving service provision capacity is not only meaningful to logistics enterprises itself but also makes sense even for businesses using services. Such a capability provides logistics organizations with the sustainability necessary to stay ahead of competitors when using logistics as a differentiator (Esper et al., 2007).

Vietnam has achieved many successes in economic since its economic integration inception of economic reform (known as "doi moi") in 1986 (Do et al., 2020; Ta et al., 2020; Hoang et al., 2021). Enterprises carry out logistics activities or register their business for logistics services in many different national economy sectors such as transportation, commerce, customs, electricity, and technology information. Dang (2019) said that Vietnam has more than 3,000 business enterprises in the field of logistics. However, very few enterprises are capable of organizing and operating the entire logistics operation process. Most logistics enterprises in Vietnam in general and the central key economic region, in particular, are small, limited in capital, technology, and human resources. Thus, they only can hire a few stages in the whole service chain. Currently, logistics enterprises in the region stop providing services in some stages of this giant service chain. The logistics industry in Vietnam and the region are still at an early stage of development; most of the logistics system has not been built and developed properly.

This study built a model of factors affecting Logistics capabilities for Logistics Service Providers and conducted the empirical analysis to assess the impact level of these factors. Based on the study results, appropriate policies are developed will contribute to improving Logistics capabilities for Logistics Service Providers in Vietnam.

2. Literature Review

Jan Tomczyk et al. (2011) pointed out the challenges of trade logistics in Vietnam and ASEAN related to the management of international cargo flows and the payment documents and procedures to cut costs directly or indirectly related to logistics through simplification and harmonization of procedures and documents. In addition, the report also outlines the strengths and weaknesses of the ASEAN logistics system. Blancas et al. (2014) has analyzed the general economic situation of Vietnam, analyzed the challenges and opportunities for businesses participating in the transport - logistics sector, and made a list of proposals for capacity in the field of transportation - warehousing. The object of investigation and

interview in the report is extensive, including many different subjects such as: shipping companies, seaport business units, truck companies, logistics service units, departments, and state-owned enterprises.

Lai (2004) determined the concept of "Service provision capacity of logistics enterprises is the ability to integrate and deploy resources to meet logistics needs of customers in pursuit of better service performance." Operational efficiency is related to such factors as: reliability, delivery speed, service quality. Operational efficiency is demonstrated through a combination of cost, quality, flexibility, and innovation. In addition, the author has evaluated the service provision capacity of 4 groups of logistics enterprises, including: TFF = traditional freight forwarders, FSP = full services logistics, TMR = transformers, NCR = Nichers. Correspondingly, logistics services are divided into 3 groups: Freight Forwarding Services (FFD), Technology-enabled Logistics Services (TEL), and Value-added Logistics Services (VAL). Research results show that there are differences between groups of logistics enterprises because each group of enterprises has different strategies pursuing. Specifically: (1) TFF only focuses on operational efficiency in FFD: consolidating small batches into large batches, thereby reducing costs and offering a more competitive price with freight; (2) TMR focuses on providing VAL and TEL services, enterprises of this group focus on developing electronic data exchange with customers; (3) FSP provides all services and the performance provided by enterprises in this group is superior to other businesses; (4) NCR focuses on supporting businesses in the FSP group in the markets and services that they have advantages. The conclusion indicated that: FSP achieved a higher average score in terms of service performance than the other 3 groups of logistics enterprises. Therefore, it is possible to evaluate service performance among logistics enterprises through service provision capacity, and service performance can be improved by improving the service provision capacity of logistics enterprises.

Mentzer et al. (2004) stated that the result of the enterprise's service provision capacity is to create value to meet customer needs at the highest level. This is the core factor that helps businesses create competitive advantages, achieve profits in the long term, and help businesses survive and thrive in the current fierce competition. In addition, the service provision capacity of each logistics enterprise is an essential part of the success of the supply chain, especially the design of timely and accurate information systems (Ballou, 1999; Handfield & Nichols, 1999; Prahalad & Krishnan, 1999). At the same time, the author has proposed four factors that make up the service provision capacity of logistics enterprises: the ability to recognize and meet customer needs, supply management capacity, information management capacity, capacity to coordinate. Stank et al. (2005)

have shown that, for logistics enterprises, integration capacity is necessary for unifying businesses to meet the goals. The integration capacity of logistics businesses is shown in two aspects of interaction and cooperation. The process of interacting with customers and other suppliers is represented by interaction, while collaboration reflects the willingness to collaborate between departments within the business.

Esper et al. (2007) found that the capabilities to identify and respond to customer needs, operational competence, integration, and communication capabilities are frequently discussed in the research papers on service provision capacity of logistics enterprises. However, Esper has added a logistics learning capability: and confirmed that the service provision capacity of logistics enterprise could have a sustainable competitive advantage when adding this capacity. Accordingly, the logistics learning capability is defined as: “The ability of a logistics enterprise to effectively maintain and manage the learning characteristics of the organization and convert learning results into strategies and tactics and logistics management activities to support and develop more service provision capacity.” Logistics learning capability is built on four components of a logistics enterprise, including: the cultural, relational, structural, and temporal components.

Shang and Marlow (2007), in a study on the effects of logistics competency on performance across 1,200 enterprises in Taiwan, made a statement that 4 logistics capabilities are identified explicitly in Taiwan’s industry, namely: integration and knowledge competency, customer-focused logistics competency, measurement competency, and agility competency. Lu et al. (2010) also conducted a study evaluating the relationship between service provision capacity and the performance of international distribution center operators in Taiwan. Research has identified three important competencies that makeup service provision capacity based on factor analysis: flexible operation capabilities, innovation capabilities, and customer response capability. Wilding et al. (2012), in the study on the role of logistics capabilities in the supply chain agility, said that: logistics capacity is viewed through three aspects of efficiency, results, and difference. Inheriting previous studies on service provision capacity of logistics firms, this study shows that the ability to meet customer needs allows businesses to make a difference in products and services; Meanwhile, operational capabilities allow businesses to focus on efficiency. Integration capacity ensures that efficiency is the result of collaborative efforts. In order to achieve individual results, information must be communicated, and the results of internal and external activities must be measured to confirm that the objectives are being met. Besides, in the study, the author modeled the relationship between the capacities of logistics enterprises in supply chain agility.

Chiu (2007) surveyed logistics enterprises in Shanghai, given 20 criteria to evaluate the service provision capacity of

logistics enterprises and 12 criteria to evaluate service quality. Survey results show that, in addition to cost, reliability and ability to provide 3PL services are factors affecting the decision to choose logistics service providers. Besides, customers appreciate logistics businesses when they help customers resolve disputes in freight transportation, trying to help customers in emergencies; provides early warning to customers about problems in shipping. In addition, customers also want businesses to improve the periodic provision of performance reports for customers; Helps customers in value analysis, cost reduction, and problem-solving. Lin (2007), in a study on service provision and third-party logistics operations, showed that the level of assessment of the supplier’s service provision capacity must meet the demand of customers. The assessment of service capabilities is based on the perspectives of both the supplier and the customer. Consequently, broader service offerings are better positioned to meet customer needs and thus achieve higher performance.

For service businesses, it must come from the needs of customers. This is the focus of research to make policies, orientations as well as provide appropriate services to satisfy customer needs at the highest level. In the current business context, companies that are capable of identifying needs and meeting the needs of customers will gain a competitive advantage over competitors in the same industry. Customers are considered the basic element of the service provision system. Without customers, there is no service. Besides, the needs of customers today are also extensive and diverse. Therefore, for service providers in general and logistics enterprises in particular, recognizing and meeting customer needs is one of the important factors that make up the service provision capacity.

Liu and Luo (2012) studied with a survey of 1,000 manufacturing firms in the central south, south, and central China regions; attempts to develop logistics capabilities for manufacturing firms can be conceptualized as a three-dimensional construct: process capability, flexibility capability, and information integration capability. According to Fernandes (2018), a way that companies have found to respond to the challenges of customer satisfaction is the development of logistics services quality.

Customer demand management capability: Customer demand management capability can differentiate products or services to enhance customer differentiation (Morash et al., 1996), including customer service and logistics services quality (Bowersox et al., 1999). This capability is also known as the integration competency (Bowersox et al., 1999) or customer-focused logistics competency (Shang & Marlow, 2007). The ability to serve customers includes: flexibility (adapting to unusual and diverse customer requirements) and the ability to respond. Daugherty et al. (1998) argued that a high level of customer needs is associated with logistics capabilities. Customer needs are the source for all logistics operations, and

these needs are reflected in the order. In the current competitive context, businesses need to find out what customers expect? When there is a demand for service, customers always expect perfect service. Besides, with organization customer characteristics, the needs of these customers are also different from those of consumers. Specifically: the organization customer requiring total solutions, not just a single service product; the number of organizational customers is small, but the service needs are frequent; organization customers want a reputable, reliable and long-term stable service provider; The needs of the organization customer are secondary, with little elasticity and cyclical variation. Customers are unlikely to engage in the long-term relationships typically associated with contract logistics if a company does not deliver satisfactory service quality, (Cahill, 2007). Therefore, customer demand management capability is considered as the main factor affecting Logistics capabilities.

Innovation capability: Innovation capability, which refers to the firm's ability to transform knowledge and ideas into new products, processes continuously, and systems for the benefit of the firm (Hurley & Hult, 1998; Lawson & Samson, 2001), contribute to improving service performance as well as quality and have significant positive relationships with the LSPs' performance (Zawawi et al., 2017). An innovation capability is essentially the ability to provide specific services that a customer requires. This is the basic capability of logistics service providers that are often closely linked with the tangible assets of the business. Innovation capability is concretized through transport capacity, providing warehouse space or ensuring delivery time, ensuring cargo safety, flexibly responding to urgent/sudden requests of customers. Timely response to requests, at the right time, at the right place, assisting customers in solving arising problems and providing accurate information that reflects the innovation capability of logistics enterprises compared to with competitors. Logistics enterprises must ensure that services are provided adequately and consistently anywhere, with any employee. Based on previous documents (Liu, 2011), 3PL's performance is measured through the criteria: cost, quality, flexibility, on-time delivery, accurate delivery, damage to delivery, speed of delivery, short delivery times, and renewal for new, better services. Therefore, innovation capability is considered as the main factor affecting Logistics capabilities.

Information management capability: Information management capability meets the operational and strategic information needs of the supply chain to balance supply-demand and facilitate communication with the supply chain (Mentzer, 2004). This capability significantly influences three important aspects of logistics service providers' competitive advantage: cost reduction, innovative service delivery, customization, and service quality improvement (Lai, 2004). Information is data in different forms such as numbers, images, events, which has been processed into

appropriate data with a certain meaning to serve its users. Baseline data are just raw data collected from various sources, not information. Only after going through the processing, the data will become information with new content and meaning to meet the purposes and requirements of different users. The information that businesses need includes information inside and outside the company. Therefore, the importance of integrating valid information with logistics services is critical (Cooper et al., 1997; Fiala, 2005; Sanders, 2005).

Information is the most potential factor that can help logistics operations become more responsive to customer needs while also helping to reduce costs. The information combined with the logistics system forms the logistics information system. This is a part of the information system of the entire enterprise towards the process of making logistics-related decisions, contributing to ensuring flexible use of enterprise resources, building an effective logistics program. Facing the trend of global economic development, the information element is a competitive weapon to ensure businesses' competitiveness. Information technology helps logistics businesses to integrate efficiently, process, exchange, and manage information flow during the transportation of goods, as well as to circulate related documents in a simple and easy way. In the context of today's information explosion and rapid changes in digital technology, one of the biggest challenges facing businesses is the increasing and unlimited demand for information. The information must be collected and processed immediately to be valuable, more accurate, timely, and thoroughly. Therefore, information management capability is considered as the main factor affecting Logistics capabilities.

In this study, we will inherit and develop based on previous researches to focus on the analysis and evaluation of dynamics, the measurement of Logistics capabilities, the factors affecting Logistics capabilities for Logistics service providers in Vietnam by using the linear structure analysis model. Therefore, the study is going to test three hypotheses as follows:

H1: *Customer demand management capability has a positive effect on Logistics capabilities.*

H2: *Innovation capability has a positive effect on Logistics capabilities.*

H3: *Information management capability has a positive effect on Logistics capabilities.*

3. Research Methodology

Based on the literature review, this study examines the impact of three factors affecting Logistics capabilities (scales), including: Customer demand management capability (CDM), Innovation capability (IC), Information management capability (IM). In particular, the factor CDM is measured by 06 observed variables (CDM1–CDM6), the

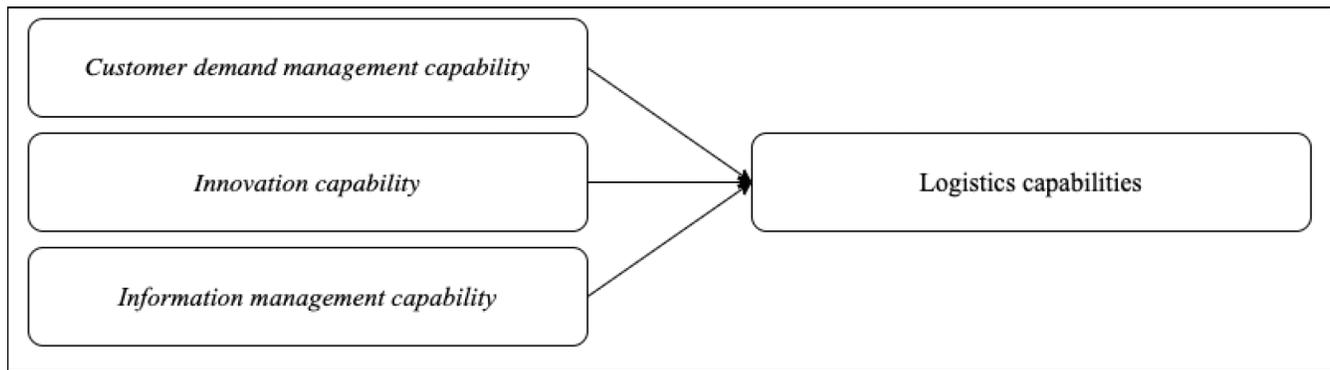


Figure 1: The Theoretical Framework of Logistics Capabilities

Table 1: Respondent Information

Information		Frequency	Percentage (%)
Location	Hai Phong	30	15.79
	Ho Chi Minh city	30	15.79
	Da Nang	35	18.42
	Hue	35	18.42
	Hanoi	60	31.58
Working duration	<5 years	72	37.89
	5–10 years	82	43.16
	>10 years	36	18.95
Total		190	31.58

factor IC is measured by 06 observations (IC1–IC6), and the Logistics capabilities is measured by 07 observed variables (LC1–LC7). Figure 1 shows the theoretical framework.

4. Results

4.1. Statistics of the Demographic Characteristics

The completed questionnaire was sent to the manager of logistics enterprises in Vietnam. There are 190 valid questionnaires received. In order to perform the Exploratory factor analysis (EFA), the sample size must be at least 5 times the total number of observed variables (Hair et al., 1998). This study has 25 observed variables, so the minimum number of samples is $25 \times 5 = 125$. For multivariate regression analysis, then the minimum sample size is calculated by the formula of $50 + 8 \times m$ (m: number of independent variables) (Tabachnick & Fidhi, 1996). The study has 03 independent variables, so the minimum sample size is $50 + 8 \times 3 = 74$ observations. Respondent information is presented in Table 1.

Table 2: Reliability of the Survey Scale

Factor	Cronbach's Alpha	Variables	Corrected Item-Total Correlation
CDM	0.849	CDM1	0.534
		CDM2	0.667
		CDM3	0.658
		CDM4	0.651
		CDM5	0.631
		CDM6	0.658
IM	0.817	IM1	0.520
		IM2	0.700
		IM3	0.606
		IM4	0.485
		IM5	0.572
		IM6	0.637
IC	0.879	IC1	0.680
		IC2	0.736
		IC3	0.739
		IC4	0.743
		IC5	0.614
		IC6	0.607

4.2. Testing the Reliability of Scales

This study uses the Cronbach Alpha (CA) analysis to determine the reliability of the valid variables for the scales (including customer demand management capability, innovation capability, information management capability) as well as Logistics capabilities. The results are in Table 2. Because all coefficients of CA are higher than 0.7 and the

values of Corrected item-total Correlation are higher than 0.4, the reliability test stand reached.

4.3. Exploratory Factor Analysis

After analyzing Cronbach's Alpha, three factors (independent variables) with 18 observed variables were included for Exploratory factor analysis (EFA). From Table 3, the KMO test coefficient calculated from the sample is $0.868 < 1.0$. Thus, the sample size of the survey is eligible to conduct EFA. Bartlett's Test of Sphericity value is significant with P -value = 0.00. This value indicates that the observed variables are correlated concerning the total number of observations.

Table 3: KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		0.868
Bartlett's Test of Sphericity	Approx. Chi-Square	1525.725
	Df	153
	Sig.	0.000

Table 4 indicates that 3 factors explain 58.409% is larger than 50% of the variation of the data set. All observed variables in Table 5 have Factor Loading is larger than 0.5. Therefore, the independent variables in the research model have converged and discriminant values.

4.4. Correlation Analysis

Table 6 shows a linear correlation between the independent and dependent variables because the value of the P -value is less than 5%. In addition, the Pearson coefficient between these variables is positive, indicating a positive relationship. This means that the increase in the value of the independent variable increases the value of the dependent variables.

4.5. Regression Analysis

Based on the result of Table 6, the study analyzes the impact of independent variables CDM, IM, IC on the dependent variable LC. The results of multiple regression analysis using the least-squares method in Tables 7–8 show that there are 03 factors affecting the dependent variable LC at 5% significance level.

Table 4: Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	5.987	33.262	33.262	5.987	33.262	33.262
2	2.750	15.279	48.541	2.750	15.279	48.541
3	1.776	9.867	58.409	1.776	9.867	58.409
4	0.895	4.975	63.383			
5	0.807	4.482	67.866			
6	0.742	4.122	71.988			
7	0.682	3.786	75.775			
8	0.577	3.206	78.980			
9	0.572	3.179	82.160			
10	0.519	2.881	85.040			
11	0.478	2.653	87.693			
12	0.433	2.408	90.101			
13	0.404	2.243	92.344			
14	0.328	1.821	94.166			
15	0.300	1.666	95.832			
16	0.280	1.557	97.388			
17	0.258	1.434	98.823			
18	0.212	1.177	100.000			

Table 5: Rotation Component Matrix

Variables	Component		
	1	2	3
IC4	0.824		
IC3	0.775		
IC5	0.740		
IC2	0.734		
IC6	0.717		
IC1	0.693		
CDM3		0.781	
CDM2		0.777	
CDM6		0.766	
CDM4		0.756	
CDM5		0.728	
CDM1		0.635	
IM2			0.811
IM6			0.789
IM3			0.716
IM5			0.684
IM1			0.656
IM4			0.560

Table 6: Correlations Between the Independent Variable and Dependent Variables

		CDM	IM	IC	LC
CDM	Pearson Correlation	1	0.208**	0.376**	0.476**
	Sig. (2-tailed)		0.004	0.000	0.000
	N	190	190	190	190
IM	Pearson Correlation	0.208**	1	0.468**	0.458**
	Sig. (2-tailed)	0.004		0.000	0.000
	N	190	190	190	190
IC	Pearson Correlation	0.376**	0.468**	1	0.695**
	Sig. (2-tailed)	0.000	0.000		0.000
	N	190	190	190	190
LC	Pearson Correlation	0.476**	0.458**	0.695**	1
	Sig. (2-tailed)	0.000	0.000	0.000	
	N	190	190	190	190

Table 7: Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	0.746 ^a	0.556	0.549	0.39860	1.720

Table 8: Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	−0.009	0.303		−0.030	0.976		
	CDM	0.284	0.061	0.244	4.632	0.000	0.857	1.166
	IM	0.188	0.065	0.159	2.883	0.004	0.779	1.283
	IC	0.527	0.058	0.528	9.048	0.000	0.700	1.429

^aSignificant at the 0.05 level.

The value of adjusted *R* Square is = 0.746 indicates that the independent variables CDM, IC, IM explained 74.6% of the variation of the dependent variable LC. The VIF values of all independent variables are less than 10, and Durbin-Watson is 1.720. The results show that the model does not have multi-collinearity, and there is no superlative autocorrelation between adjacent errors. The regression model reflects the impact of the independent variables on the dependent variable LC is:

$$LC = -0.09 + 0.244 \times CDM + 0.159 \times IM + 0.528 \times IC$$

5. Conclusion

This research examined and analyzed the impact of customer demand management capability, innovation capability, information management capability on the Logistic capability by EFA and multi-linear regression model. The study results confirm the significant positive influence of these factors on Logistic capability at a 5% significance level. The research results identified the following factors affecting Logistics capabilities for Logistics Service Providers: innovation capability has the strongest impact on Logistics capabilities; customer demand management capability has the following strong effects on Logistics capabilities; and finally, the information management capability that affects Logistics capabilities.

On that basis, the article proposes solutions to enhance to improve Logistics capabilities for Logistics Service Providers in Vietnam: Logistics Service Providers need to be aware of the role of innovation capability and take measures to enhance this capability. Logistics Service Providers need to improve the ability to recognize and respond to customers' needs by focusing on investment in resources to create competitiveness for businesses, exploiting and combining business resources with resources of other partners to reconnect when providing services. At the same time, regularly conduct market and customer surveys for the logistics services of enterprises. They are innovating and enhancing technology solutions in the business operations

of enterprises. Be aware of the importance of formulating an information management strategy. Building an information technology application roadmap starts from the business management team because they are the ones who decide to apply the information to the enterprise's business process.

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