The effects of customer relationship management, human resource competence and internal control systems on the effectiveness of supply chain management in the Indonesian public sector

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ABSTRACT

The purpose of this research is to empirically examine the factors that influence effectiveness of supply chain management by investigating the role of the variables of the customer relationship management, human resource competence, and the organization’s internal control system. The research method used is explanatory research and the type of research is verification. The research instrument was tested through the validity and reliability of the data. Furthermore, inferential data analysis using SEM-PLS statistics. The results found that the factors that affect the effectiveness of supply chain management were customer relationship management, competence of human resources affects the effectiveness of supply chain management, and internal control system. The results are useful for providing and utilizing various forms and means of communication and for managing the customer relationship, developing human resources, and updating control systems continuously in public organizations.

1. Introduction

The supply chain management can be generated through the function of a customer relationship management system. As it can accommodate and combine various technological channels, the use of customer relationship management is believed to be a superior information technology for creating greater transparency in organizational service activities which ultimately aims to increase organization performance as a whole and improve the organizational capability in decision making (Robinson, 2004). Furthermore, Kieso et al. (2012) argued that the customer relationship management basis has become the basis commonly used by companies, both large and small companies, both those that have gone public and those that have not gone public because the customer relationship management basis is believed to provide a better picture of company performance in the eye of their customers, so that companies can make policies that are more relevant for the future regarding their existing and potential customers. The implementation of customer relationship management in organization cannot be as easily implemented as in the private sector because of the challenges faced by the organization in implementing the system, including commitment and support from leaders and decision makers in organization, availability of human resources competencies and professionalism in service management. Another factor that encourages the effectiveness of supply chain management besides the function of customer relationship management system and human resource competence is the implementation of the internal control system. An effectiveness of supply chain management that has good quality information value cannot be separated from the implementation of a good internal control system (Simanjuntak, 2010; Syarifadin, 2014; Nurwulandari et al., 2019). Furthermore, customer relationship management should be supported by the competence of human resource and the internal control as a means for business sustainability. The efforts in the organization are to develop and improve organizational relationships with customers through the organization's ability to explore the available channels directly with its customers and ensure that it is properly backed by competent human resources. The existence of the mutual relationship between consumer and organization is beneficial for the organization since it always improves the quality of organizational resources as well as guarantees customer relationships. In general, various studies related that customer development requires...
multiple channels with multiple designs to improve management functions in the form of coordination, planning, deployment and evaluation of the channels used. Hence, the purpose of this research is to empirically examine the factors that influence effectiveness of supply chain management by investigating the role of the variables of the customer relationship management, human resource competence, and the organization’s internal control system.

2. Literature Review

2.1 Customer Relationship Management and Effectiveness of Supply Chain Management

Customer relationship management is important as a basis for continuous performance to ensure a match between the customer strategy and the objectives set by the organization. In general, various literatures as a determination of organizational customer relationship management to build direct relationships with customers to increase added value for the company through available channels (Kumar, 2010). The availability of various channels is also to increase the two-way interaction between the company and customers which is effectively used to increase acquisition capabilities and customer retention (Neslin et al., 2006). Verhoef et al. (2010) stated that consumers in a network society refer to easy and two-way interactions between customers and organizations through available channels. In the field of service management, CRM is very important and has high implications for improving effectiveness of supply chain management. This can be of the nature of the service organization which requires a high level of trustworthiness with the customer. In this function, CRM can be used to provide and collect data from various communication channels including the provision of relevant information on the organization’s website (Anggraeni, 2020). Furthermore, to improve effectiveness of supply chain management, CRM can be used as an organizational system to facilitate business operations to improve the ability to understand consumers and meet their expectations.

H1. The customer relationship management significantly affects the effectiveness of supply chain management.

2.2 Effect of Human Resources Competence on the Supply chain management

Human resource competence in management context describes a person's ability to transfer and apply knowledge and skills to produce something at a satisfactory level. Selznick et al. (1957) suggests that a key competency is knowledge and the ability to carry out certain types of activities that usually involve a combination of technical expertise and application skills. Meanwhile, according to Stewart & Brown (2011) a main competency is the practice of human resource competencies that are related to the knowledge, skills and abilities needed to recruit, employ, and compensate employees. Competence is the ability and characteristics of an employee in the form of knowledge, skills, attitudes, and behaviors needed in carrying out their duties, so that these employees can carry out their duties in a professional, effective and efficient manner (Mufti et al., 2019). Nuryanto & Afiah (2013), suggest that the competence of the employees has a positive and significant effect on the service management. This opinion is confirmed by Zahara (2015), that the competence of public organization officials affects the organization effectiveness of supply chain management.

H2. There is a significant effect of human resource competence on the effectiveness of supply chain management.

2.3 Internal Control Systems and the Supply Chain Management

Internal control is a process that is influenced by organizational leadership, management, and other personnel which is designed to provide reasonable assurance that organizational goals will be achieved (Arens et al., 2010). The organization’s internal control system component refers to components and sub-components such as control environment, risk assessment, activity control, information and communication system, and monitoring (Arens et al., 2012; COSO, 2013; Arens et al., 2014). The implementation and measure of the effectiveness of organization supply chain management is to achieve effective and efficient organization activities, protection of company assets, reliability of effectiveness of supply chain management and compliance with organizational policies. Kieso et al. (2012) suggests that one of the objectives of designing an internal control system is the reliability of supply chain management Arens et al (2014) suggest that the internal control system is very important as an effective control for management to meet the reliability of service management, and the effectiveness and efficiency of operation. Reliability is one of the qualitative characteristics of information that is used as a measure of the service management. Nuryanto and Afiah, (2013), Afiah and Azwari (2015) suggest that the organization’s internal control system has a positive effect on the organization effectiveness of supply chain management.

H3. There is a significant effect of internal control systems on the effectiveness of supply chain management.

3. Research Methods

The research method used in this research is explanatory research and is a causal study, namely research which states what and how far the factors affect the effectiveness of supply chain management as seen from the customer management, human resource competence, and organization’s internal control systems through hypothesis testing. This study uses three
independent variables, consisting of the customer relationship management (X1), human resource competence (X2), and organization’s internal control systems (X3) and one dependent variable, which is the effectiveness of supply chain management (Y). The customer relationship management (X1) refers to the planned actions and actualization of the report system that recognizes and presents transactions or other economic events at the time the event occurs, regardless of whether cash or cash equivalents are received or issued to achieve organizational goals (Ouda, 2003; Ouda, 2010; Robinson, 2004; Khan & Mayes, 2009). The dimensions of the variable the customer relationship management are indicators of completeness of order management and availability, channel and partner management, customer insight and technical documentation with indicators of integration between the service system and the asset management system, the integration of the service system, the conformity of the application output with customer relationship management standards. Human resource competence (X2) refers to the ability of employees who carry out service supply chain management functions that include aspects of knowledge, skills and behavior in carrying out their duties (Rowley & Jackson, 2011; Stewart & Brown, 2011; Mejia et al., 2005; Dessler, 2016; Robbins & Coulter, 2012; Mondy & Martocchio, 2016). The dimensions of the human resource competency variable are (a) knowledge with indicators of suitability of education, length of experience, and hours of training, (b) skills with indicators: being able to apply a regional service procedure system, being able to apply supply chain management standards, being able to compile effectiveness of supply chain management, and being able to apply an asset management procedure system; and (c) employee work behavior.

Organization’s internal control system (X3) was defined as the design of general controls and application controls to ensure that all elements of internal control are implemented in a special application system contained in each organizational cycle (Arens et al., 2012; Arens et al., 2014; COSO, 2013). The dimensions of the organization’s internal control system variable are of (a) control environment with indicators of having integrity and ethical values, having commitment to competence, philosophy and management operating style, having an organizational structure, granting authority and responsibility, policies and practices of human resources, the role of an effective organization internal control employees, and a good working relationship with the relevant organization; (b) risk assessment with indicators of risk identification, risk analysis and risk management; (c) controlling activities with indicators of performance review, information processing, physical control, segregation of duties, as well as recording and documentation; and, (d) information and communication systems with indicators: providing and utilizing various forms and means of communication, managing, developing and updating information systems continuously. Effectiveness of supply chain management (Y) was defined as the characteristics of information about the entity’s service condition and results aimed at meeting user satisfaction by using supply chain management indicators (Brookson, 2009; Bodnar & Hopwood, 2010; Cohen & Kaimenakis, 2011; Kieso et al., 2012; Harrison et al., 2012; Arens et al., 2012; Arens et al., 2014). The dimensions of the variable of supply chain management are (a) relevance with the indicators of having feedback, having predictive value and on time; (b) reliability; (c) consistency in the function of service management, internal comparisons over time, and comparisons between organizations. Population refers to the entire group of people, events, or things of interest that the researcher wants to research (Sekaran & Bougie, 2013). The populations in this study were all 34 district/municipal organizations in North Sumatra Province, so that all members of the population were used as research samples (saturated sampling). This study uses primary data, namely the data obtained refers to first-hand information by researchers related to interest variables for specific purposes of the study (Sekaran & Bougie, 2013). Primary data used in this study were taken directly from the service and asset managers and supervisors in public organizations with 136 respondents being taken as sample. To obtain the accuracy of the research results, before the questionnaire was distributed to the research respondents, the research instrument was tested using validity and reliability tests. According to Hair et al. (2016) the construct has good validity if the Average Variance Extracted value is ≥ 0.50 while the construct has good reliability if the Construct Reliability value is ≥ 0.70. Based on the results of data processing using the product moment correlation, the results of the research instrument validity test for the variable the customer relationship management (X1), human resource competence (X2), organization’s internal control system (X3) and effectiveness of supply chain management (Y) meet the requirements in testing validity with a correlation coefficient of ≥ 0.50. While the results of data processing using the alpha-Cronbach method obtained the results of the research instrument reliability test for the variable the customer relationship management (X1) has a reliability coefficient value of 0.965, human resource competence (X2) has a reliability coefficient value of 0.962, the organization’s internal control system (X3) has a reliability coefficient value of 0.988, and the effectiveness of supply chain management (Y) 0.971. The reliability coefficient value of the four research variables is ≥ 0.70, these results indicate that the questionnaire items on the four variables are reliable to measure each of the variables.

Analysis of the data used in this research is through structural equation modeling (SEM) based on components or variance known as Partial Least Square (PLS). Hair et al. (2016) suggest that Partial Least Square SEM (PLS SEM) is used to build theory in exploratory research by explaining the variance of the dependent variable when testing the model. The structural equation modeling (SEM) based on component or variance was chosen based on the consideration of the number of samples, namely 34 public organizations with 136 respondents.

4. Results

This study uses primary data through distributing questionnaires to 34 organizations in the North Sumatra Province by taking the service and asset managers and supervisors as the sample totaling 136 persons and all questionnaires returned completely and used in data analysis. To answer the research hypothesis, a structural model analysis was performed to determine the
causal relationship between latent variables. Structural model is a model that connects exogenous latent variables with endogenous latent variables or the relationship of endogenous variables with other endogenous variables.

![Path Diagram of the Structural Model](image)

Fig. 1. The results of structural equation modeling

Information: CM: Customer relationship management (X1); HRC: Human Resource Competencies (X2); ICS: Internal control system (X3); SMP: Effectiveness of supply chain management (Y).

Table 1 was presented as a summary of the value of the path coefficient which explains the results of the estimation of the effect of the customer relationship management (X1), human resource competence (X2), organization’s internal control system (X3) on the supply chain management (Y).

Table 1
Path Coefficients dan R-Square

<table>
<thead>
<tr>
<th>Endogenous Variables</th>
<th>Exogenous Variables</th>
<th>Path Coefficients</th>
<th>t-stat.</th>
<th>R-Square</th>
</tr>
</thead>
<tbody>
<tr>
<td>SMP (Y)</td>
<td>CRM (X1)</td>
<td>0.361</td>
<td>2.392</td>
<td></td>
</tr>
<tr>
<td></td>
<td>HRC (X2)</td>
<td>0.304</td>
<td>2.334</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ICS (X3)</td>
<td>0.322</td>
<td>2.573</td>
<td>0.848</td>
</tr>
</tbody>
</table>

Table 1 shows that the total value of the influence of exogenous variables, consisting of the effect of the customer relationship management (X1), human resource competence (X2), the organization’s internal control system (X3) on the supply chain management (Y) is 0.848 or 84.8 percent. This shows that 0.848 or 84.8 percent of the supply chain management is influenced by the exogenous variables used in this study, while the remaining 15.20 percent is the influence of other factors not examined. Furthermore, based on Table 2, hypothesis testing can be done to determine the magnitude of the influence of each exogenous variable on the endogenous variable. The value of t-stat. of the variable of the customer relationship management (2.392>1.978) at the 5 percent significance level, means that the customer relationship management variable has a significant effect on the effectiveness of supply chain management in public organizations. Thus, the first hypothesis stating the customer relationship management significantly affects the effectiveness of supply chain management was accepted. It can be concluded that the customer relationship management has a significant effect on the effectiveness of supply chain management in public organizations.

Table 2
Direct, Indirect, and Total Effect

<table>
<thead>
<tr>
<th>Relationship</th>
<th>Direct</th>
<th>Indirect</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>CRM → SMP</td>
<td>0.130</td>
<td>0.091</td>
<td>0.19</td>
</tr>
<tr>
<td>HRC → SMP</td>
<td>0.092</td>
<td>0.074</td>
<td>0.165</td>
</tr>
<tr>
<td>ICS → SMP</td>
<td>0.103</td>
<td>0.074</td>
<td>0.173</td>
</tr>
</tbody>
</table>

Simultaneous influence 0.848

Remainder influence of outside variables examined 0.152

CRM= customer relationship management; HRC= human resource competence; ICS=internal control system; SMP=effectiveness of supply chain management
Based on the results of hypothesis testing, it is known that the customer relationship management has an effect on the effectiveness of supply chain management. This is indicated by the $t_{\text{stat}}$ and $t_{\text{table}}$ value $(2.392>1.978)$ at the 5 percent significance level. Directly, the customer relationship management affects the effectiveness of supply chain management by 13 percent and indirectly because the relationship with two other exogenous variables gives an effect of 19 percent so that the total effect of the customer relationship management on the supply chain management is 32 percent. This means that 32 percent of the effectiveness of supply chain management can be explained by the customer management. The better the customer management, the better the resulting supply chain management and the remaining 77 percent is influenced by other factors. Customer relationship management focuses on measuring the economic resources and changes in the organizational resources of an entity. The function of customer relationship management can create better transparency for public sector activities because it is able to measure the use of its capital resources by comparing the benefits and costs of each activity or public sector output (Jones & Pendlebury, 2004; Simanjuntak, 2010). The results of this study are in line with previous research which states that the customer relationship management is the right approach in increasing the accountability and transparency of supply chain management so that the implementation of customer relationship management has a significant effect on the effectiveness of supply chain management (Ouda, 2003; Ouda, 2004; Abolhalaje et al., 2012; Ofoegbu, 2014; Najati & Pituringsih, 2016; Adyana et al., 2020). In terms of the effect of human resource competence on the service management, based on the results of hypothesis testing, it is known that human resource competence influences the effectiveness of supply chain management. This is indicated by the $t_{\text{stat}}$ and $t_{\text{table}}$ value $(2.334>1.978)$ at the 5 percent significance level. The competence of human resources directly affects the effectiveness of supply chain management by 9.2 percent. Indirectly, because of its relationship with two other exogenous variables, it has an effect of 16.5 percent so that the total effect of human resource competence on the supply chain management is 25.7 percent. This means that 25.7 percent of the effectiveness of supply chain management can be explained by the competence of human resources. The more competent the human resources of the organization service sector employees, the more quality the effectiveness of supply chain management is produced, and the remaining 74.3 percent is influenced by other factors. Human resource competence is a basic characteristic of individuals who have a causal relationship as a effective reference in doing work. The competence of the human resources of the service employees is measured from the knowledge possessed by looking at the suitability of education, length of experience, and training hours attended. Furthermore, in terms of skills, it can be seen from the ability to apply a service procedure system, apply customer relationship management standards, and the ability to compile effectiveness of supply chain management, and apply an asset management procedure system. The results of this study are in line with previous research which states that employee competence has a significant effect on the effectiveness of supply chain management (Ouda, 2003; Ouda, 2004; Eriotis et al., 2011; Nuryanto & Afiah, 2013; Zahara, 2015; Iskandar & Setiyawati, 2015; Hasanudin et al., 2020).

Lastly, in the effect of organization’s internal control systems on the service management, based on the results of hypothesis testing, it is known that the organization’s internal control system affects the effectiveness of supply chain management. This is indicated by the $t_{\text{stat}}$ and $t_{\text{table}}$ value $(2.573>1.978)$ at the 5 percent significance level. The organization’s internal control system directly affects the effectiveness of supply chain management by 10.3 percent. Indirectly because the relationship with two other exogenous variables has an effect of 17.3 percent so that the total influence of the organization’s internal control system on the supply chain management is 27.6 percent. This means that 27.6 percent of the effectiveness of supply chain management can be explained by the organization's internal control system. The better the organization’s internal control system, the better the resulting effectiveness of supply chain management and the remaining 72.4 percent is influenced by other factors. The implementation of the organization’s internal control system is carried out by observing the control environment through its integrity and ethical values, commitment to competence, management philosophy and operation style, having an organizational structure, granting authority and responsibility, human resource policies and practices, the role of the organization internal control employees effective, and good working relationship with the relevant organization. The existence of risk assessment by identifying risks, risk analysis and risk management. Furthermore, controlling activities by reviewing performance, information processing, and physical control. Providing and utilizing various forms and means of communication, managing, developing, and updating information systems continuously. The internal control system for the organization has largely been acknowledged as the organization’s internal control system as an integral process for actions and activities carried out continuously by the leadership and all employees to provide adequate confidence in the achievement of organizational goals through activities that are effective and efficient, reliability of service management. The results of this study are in line with the theory and results of previous studies which state that the internal control system is a process that is implemented to provide adequate assurance that control objectives can be achieved in order to protect the company from risk and minimize the impact of risks so that a good internal control system can be implemented affects the effectiveness of supply chain management (Arens et al., 2012; COSO, 2013; Nuryanto & Afiah, 2013; Romney & Steinbart, 2015).

5. Conclusion

The findings showed that the customer relationship management has a significant effect on the effectiveness of supply chain management. The better the customer management, the better the effectiveness of supply chain management. The statistical output also showed that competence of human resources has a significant effect on the effectiveness of supply chain management. Lastly, the organization's internal control system has a significant effect on the effectiveness of supply chain management. The practical implication of this research is to improve the effectiveness of supply chain management that is relevant, reliable, understandable, and comparable, and fulfill supporting facilities in the form of information technology. The
implication of this research is that in order to achieve the effectiveness of supply chain management that are relevant, reliable, understandable, and comparable, it is necessary to optimize personnel management by HR department through personnel planning and increase the effectiveness of education and training implementation as well as the promotion and reward based on the need for resources human power. The managerial implication is that to achieve the service effectiveness of supply chain management that is relevant, reliable, understandable, and comparable, public organizations need to optimize the assessment and evaluation of the implementation of the organization's internal control system.

References


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