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Determinants of Performance of Logistic Management Information System in Public Procurement and Property Authority of Dire Dawa, Ethiopia

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Abstract
This research study aimed to investigate the determinants of the performance of the Logistic Management Information System (LMIS) in the Public Procurement and Property Authority of Dire Dawa. The study utilized a descriptive and explanatory research design, and a structured questionnaire was administered to a sample of employees. The data collected was analyzed using Multiple Linear Regression Analysis (MLRA). The findings of the study revealed that the dimensions of the Logistic Management Information System (Data Management Systems, Information Integration Capabilities, Decision Support Systems, and Effective Communication and Collaboration Systems) have a positive and significant predicted on the performance of the LMIS. This implies that the effective management of data, integration of information, utilization of decision support systems, and fostering effective communication and collaboration systems are crucial in determining the performance of the LMIS. The study suggests that organizations should focus on enhancing these dimensions of the LMIS to improve overall performance in logistic management. Further research can explore additional factors that may influence the performance of the LMIS and investigate their impact in different organizational settings. This study contributes to the existing body of knowledge by highlighting the key determinants that influence the performance of the LMIS in the context of the Public Procurement and Property Authority of Dire Dawa.
Keywords: Data Management, Information Integration, Decision Support, Communication and Collaboration, Performance of LMIS, Public Procurement and Property Authority of Dire Dawa
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Introduction

The Logistic Management Information System (LMIS) is a critical component of modern logistics operations, helping businesses to effectively implement and oversee their supply chain strategies. Since the 20th century, when information technology (IT) was used globally, there has been a discernible advancement in technological advancement (Waigwa & Njeru, 2016). The emergence of IT across multiple industries can be attributed to ongoing progress and adaptability to everyday situations, including fiercely competitive corporate environments (Abdullahi et al., 2019). Planning and arranging tasks to guarantee that resources are available to carry out the process in an efficient and effective manner is known as logistics (Mellat-Parast & Spillan, 2014).

Therefore, according to Natasha, Sasho, and Vladimir (2017), logistics must respect the processes of procurement, storage, transport, and information management as well as their design, implementation, and control, all with the aim of improving them. Accordingly, a large corpus of research has been written explaining how logistics management is viewed as a component of supply chain management, which deals with the effective management of goods (Kanda & Iravo, 2015; Springinklee & Wallenburg, 2012; Kukovič, Topolšek, Rosi, & Jereb, 2014; Andry & Loisa, 2019). The purchase process, distribution, employee capabilities, and technology are a few of the variables influencing supply chain efficiency (Kanda & Iravo, 2015).

With the advancement of technology, logistics management has changed and grown in importance in doing business. Owing to the difficult challenges facing the logistics industry today, supply chain management (SCM) includes the Logistic Management Information System (LMIS), which plans, executes, and regulates the efficient, effective forward and reverse flow and storage of goods, services, and related information output between the point of origin and the point of consumption in order to satisfy consumer demand (Kukovič, et al., 2014; Andry & Loisa, 2019). Organizations can improve overall operational efficiency, improve decision-making, and optimize supply chain processes with the help of the LMIS (Rotich & Okello, 2015).

As a result, as technology advances, logistics management methods and information technology are integrated to enable the smooth movement of information, services, and items along the supply chain. In order to help firms make wise decisions and maximize their logistics operations, it includes the gathering, storing, processing, and sharing of data and information pertaining to logistics activities (Smith & Johnson, 2022). Moreover, Muwema and Phiri (2020) clarified that LMIS is an essential tool for businesses to manage their logistics operations efficiently. To make it easier for information, services, and items to move along the supply chain, information technology and logistics management techniques are integrated. Organizations may improve overall operational efficiency, allocate resources optimally, and make well-informed decisions with the help of LMIS. Azmeraw and Gizachew (2021) proposed that LMIS gives consumers the ability to obtain the appropriate data in the appropriate quantity, quality, and location at the appropriate time and cost. Programs will invariably waste important resources in the absence of a logistics management information system. Information, therefore, is the glue that keeps companies together and may be utilized to integrate procurement process activities both within a process and across several processes, as stressed by (Scherer, Siddiq, & Tondeur, 2019). According to Al-Hakim, Al-Hakim, and Al-Qurashi (2019), the significance of LMIS gives decision-makers instant access to pertinent data, empowering them to make well-informed and calculated choices. It makes it easier to integrate different corporate functions-like marketing, operations, finance, and human resources- by providing a centralized platform for data management.

LMIS also improves coordination and communication between various management tiers, which results in better decision-making procedures. Because they are knowledgeable with LMIS, competent procurement staffs are crucial to public entities' improved performance (Mrope, 2018). In summary, an organization's ability to manage its logistics operations efficiently depends on the use of the Logistic Management Information System (LMIS). To make it easier for information, services, and items to move along the supply chain, information technology and logistics management techniques are integrated. Organizations may improve overall operational efficiency, allocate resources optimally, and make well-informed decisions with the help of LMIS. The researchers were therefore inspired to investigate the factors influencing the effectiveness of the logistical management information system in the public procurement and property authority of Dire Dawa based on this prior knowledge.

Statement of the Problem

For enterprises to optimize their logistical operations, the effective installation and acceptance of Logistic Management Information Systems (LMIS) are essential. However, a number of obstacles and issues prevent LMIS from being used effectively. Numerous recent research have shown that; The main challenges in identifying the factors that influence LMIS implementation in various industries and in different countries are highlighted by the following: lack of comprehensive understanding by (Smith & Johnson, 2022); organizational resistance and culture by (Chen & Wang, 2023); information quality and data integrity by (Garcia & Rodriguez, 2023); user acceptance and training by (Lee & Kim, 2023) and technological infrastructure and integration by (Chen & Wang, 2023). These studies offer insightful information on the factors that influence LMIS acceptance and implementation, emphasizing the importance of elements like organizational culture, top management support, information quality, and user acceptance, and compatibility.

In terms of local cases, research has yielded a variety of results in Ethiopia. Desale, Taye, Belay, and Nigatu (2017) evaluated the state of the laboratory logistics management information system for HIV/AIDS and tuberculosis laboratory commodities in Addis Ababa public health facilities. After applying descriptive statistics to the data, it was discovered that a well-thought-out logistics system for laboratory supplies, complete with pharmacy staff that have received training, standard LMIS formats, and established inventory control methods, was in place. The majority of laboratory staff, however, lacked LMIS training. Alemu, Jemal, Gashe, Suleman, and Sudhakar (2021) carried out a second study with the goal of evaluating the obstacles and advancements made in the process of implementing the integrated pharmaceutical logistics system (IPLS) in a few chosen health institutions in the Wollega zones of Western Ethiopia.

Order fills rate, storage condition, stock availability and status, and Logistics Management Information System (LMIS). The results of multivariable regression showed that IPLS deployment was favorably correlated with LMIS, stock status, and availability of tracer medications. Zewdie's (2020) study also evaluates the impact of information systems on the performance of logistics management in Ethiopian shipping and logistics services companies. Inventory management, transport management, warehouse management, procurement management,

organizational obstacles, technical challenges, and user challenges were all dependent variables on LMIS performance. Furthermore, Azmeraw and Gizachew (2021) evaluate the effectiveness of the logistics management information system and investigate issues in public health facilities located in the northwest Ethiopian region of East Gojjam zone. The findings demonstrated that inadequate facility configuration and a deficiency of organizational support were identified as the main information barriers for logistics management.

According to Alemu et al. (2021), Ethiopia's pharmaceutical supply chain management system has a number of issues, such as poor stock management, poor storage, non-availability, and irrational use. Furthermore, the performance of the logistics management information system in the health service delivery points under Jimma Zone, Oromia, Ethiopia, is examined by Sileshi, Ayalew, and Mulatu (2021). The findings of the regression analysis showed that variables linked to supply chain; personnel, management, and information have a strong and favorable influence on LMIS performance, accounting for 72.8% of dataset changes. Determining the factors that influence the installation of logistic management information systems (LMIS) is a complex task. Lack of a thorough grasp of the causes, organizational resistance and culture, data integrity and information quality, user acceptability and training, and technology infrastructure and integration are some of these issues. In order to successfully deploy LMIS and overcome obstacles, businesses must address these issues. This will improve their capacity for making decisions and improve logistics operations. Although not unique to Dire Dawa Public Procurement and Property Authority, manual systems have been a major source of inefficiencies in the procurement function's operations and the adoption of LMIS in organizations. Professionals were also not trained in LMIS. Although there is a large and expanding corpus of empirical research done in Ethiopia, Desale et al. (2017) attempted to evaluate the state of laboratory, Alemu, et al., (2021) assess the progress and challenges towards the implementation of IPLS in selected health facilities.

Furthermore, Sileshi et al. (2021) investigate the factors influencing LMIS performance in the provision of health services, while Azmeraw and Gizachew (2021) evaluate LMIS performance and investigate issues in public health institutions. The only study to evaluate the impact of an information system on the performance of logistics management in an Ethiopian shipping and logistics services enterprise is Zewdie (2020).

To the best of our knowledge, no research has adequately examined the performance of LMIS in public procurement and property authority of Dire Dawa administration, nor have studies looked at the determinant factors of LMIS in the context of [Data Management, Information Integration, Decision Support, and Communication and Collaboration]. This research study may therefore close this gap.

Therefore, the goal of this study is to determine and examine the LMIS determining elements that significantly and favorably affect LMIS performance. The purpose of the study is to provide light on the factors that affect logistics performance and how LMIS is determined. The purpose of this study is to further our understanding of how businesses may use LMIS to improve performance outcomes and optimize their logistics operations. Given this, the study's findings have a substantial impact on future efforts to close the aforementioned gaps in the study's conclusions and develop solutions to its research goals. This research study's main goal was to investigate the factors that influence the logistic management information system's performance in the public procurement and property authority of Dire Dawa.

1. To examine the role of data management within LMIS in improving logistics performance.
2. To investigate the impact of information integration in LMIS on logistics performance.
3. To evaluate the effect of decision support tools within LMIS on logistics performance.
4. To explore the contribution of effective communication and collaboration facilitated by LMIS to improved logistics performance.

Theoretical Literature Support for Logistic Management Information System

Understanding the theories and frameworks underlying the Logistic Management Information System (LMIS) is made possible by reading theoretical literature. The main theoretical stances and frameworks that facilitate the comprehension and use of LMIS are discussed in this part along with pertinent references.

RBV or Resource-Based View: The idea known as the Resource-Based View (RBV) places significant emphasis on the strategic role that resources and capabilities play in attaining a competitive edge. RBV contends that, when applied to LMIS, efficient use of information resources-such as data, technology, and knowledge-can improve logistics performance and provide businesses a competitive advantage (Barney, 1991).

Technology-Organization-Environment (TOE) Framework: This framework offers a thorough analysis of the variables affecting the adoption and application of new technologies. The technological, organizational, and environmental elements-such as industry dynamics, organizational culture, and technological readiness-that have an impact on the effective implementation of LMIS are identified in the context of LMIS using the TOE framework (Tornatzky & Fleischer, 1990).

Theory of Diffusion of Innovation: The process by which new technologies are embraced and dispersed inside businesses is examined under the Diffusion of Innovation theory. This theory aids in the understanding of the variables that affect the adoption and spread of LMIS in the context of that system, such as perceived benefits,

compatibility with current systems, and the power of opinion leaders within the company (Rogers, 2003)

Information Systems Success Model: This model offers a framework for assessing an information systems implementation's level of success. This paradigm, when applied to LMIS, aids in evaluating the efficacy of LMIS by taking into account elements including user happiness, system and information quality, and the influence on organizational performance (DeLone & McLean, 2003).

The Technology Acceptance Model: The goal of the Technology Acceptance Model (TAM) is to comprehend how users accept and embrace new technology. Within the framework of LMIS, TAM assists in identifying the elements-such as perceived utility, usability, and user attitudes toward technology adoption-that impact user acceptance and utilization of LMIS (Davis, 1989).

Theoretical literature, in summary, offers a strong basis for comprehending and applying logistic management information systems (LMIS). Information resources are strategically important, according to the Resource-Based View (RBV) theory, and the Technology-Organization-Environment (TOE) framework outlines the components that affect LMIS deployment. The adoption process is explained by the Diffusion of Innovation theory, and the effectiveness of LMIS is assessed using the Information Systems Success Model. Furthermore, understanding user acceptance and LMIS adoption is aided by the Technology Acceptance Model (TAM). Organizations can improve their grasp and application of LMIS and get a competitive edge by utilizing these theoretical vantage points. This will boost logistics performance.

Challenges and Problems Hinder the Effective Utilization of LMIS

Lisa (2012) states that the Logistic Management Information System frequently faces issues including inadequate recordkeeping, which includes inaccurate or out-of-date stock and consumption records. Data not moving up or down the system facilities not submitting reports to districts, districts not sending reports to central, central not giving districts and facilities feedback, and data not used for decision making are examples of poor reporting, including incomplete, late, and low-quality reports. Pharmaceutical supply decisions are impacted by inadequate and inappropriate logistics management information systems (LMIS). This leads to quantification, procurement, and distribution that are not based on real demand, which wastes resources by causing stock outs of essential medicines or drug expiration (USAID 2011, cited in Sileshi, Ayalew & Mulatu, 2021). Andry and Loisa (2019) have stated that the limitations of LMIS include the fact that all confidential and sensitive data are stored in the system and should not be viewed by external parties or individuals who are not authorized or certified to do so. Additionally, the study has observed that staff members' accounts on the LMIS site remain active even after they leave the office; occasionally, these accounts or statements may be construed negatively. Additionally, Vlachos (2016) notes that the following six reverse logistics competencies affect how well businesses perform: supply chain integration, supply chain coordination, logistics information management, and conformity capability, and institutional incentives.

The main challenges in identifying the elements that affect LMIS adoption in the manufacturing and service sectors have been examined by a number of academics. One such study was conducted by (Smith & Johnson, 2022; Chen & Wang, 2023; Garcia & Rodriguez, 2023; Lee & Kim, 2023; Chen & Wang, 2023). Absence of a thorough comprehension Lack of a thorough grasp of the elements influencing the successful implementation of LMIS is one of the main issues in identifying its determinants. Many businesses have trouble figuring out the important factors and how they relate to one another, which results in less than ideal use of LMIS.

Organizational resistance and cultural hurdles: Implementing LMIS is significantly hampered by organizational opposition and cultural barriers. The adoption and integration of LMIS into current logistics operations may be hampered by organizational culture conflicts, resistance to change, and a lack of support from upper management (Chen & Wang, 2023).

Data integrity and information quality: For efficient operations and sound decision-making, LMIS's data integrity and quality are essential. However, due to data inaccuracies, inconsistencies, and inadequate data management techniques, it might be difficult to provide accurate, timely, and relevant information (Garcia & Rodriguez, 2023).

User acceptance and training: These two factors are essential to the LMIS's successful adoption. Logistics staff may find it difficult to adopt and operate LMIS because to a lack of user acceptance, inadequate training programs, and poorly designed user interfaces (Lee & Kim, 2023).

Integration and technical infrastructure: The deployment of LMIS depends on the compatibility and availability of the technological infrastructure. The smooth integration and use of LMIS may be impeded by inadequate IT infrastructure, a lack of integration with current systems, and interoperability problems (Chen & Wang, 2023).

Numerous earlier studies that examined the factors influencing the installation of logistic management information systems (LMIS) are complex and call for careful evaluation, as the literature review part of the study makes clear. The primary causes of the Integrated Logistics System's [ILS] poor performance are improper transportation methods, incompatible specifications, procurement process response time issues, a shortage of

trained personnel, inadequate information technology infrastructure, and inventory practices that are not LMIS-supported. Furthermore, every empirical study that has been evaluated offers insightful information about the elements that affect the adoption of LMIS, such as organizational culture, support from upper management, the quality of the information, user acceptance, and organizational readiness.

Organizations may improve decision-making, optimize logistical operations, and gain a competitive edge in the fast-paced business world of today by comprehending these factors. In summary, there are a variety of issues involved in identifying the factors that influence the deployment of logistic management information systems (LMIS). Lack of a thorough grasp of the causes, organizational resistance and culture, data integrity and information quality, user acceptability and training, and technology infrastructure and integration are some of these issues. Nonetheless, there remains a gap in Ethiopian research since little is known about the factors influencing LMIS success in public sector companies. This research attempted to close these gaps. Moreover, even though the analysis's findings would be very different from what we know from earlier research in this field. In order to successfully deploy LMIS and overcome obstacles, businesses must address these issues. Therefore, this study needs to close the following gaps: it will carefully examine the outcome variable of Performance of Logistic Management Information System in Public Procurement and Property Authority of Dire [Data Management, Information Integration, Decision Support, and Communication and Collaboration] broad areas thoroughly examine the variable of Performance of Logistic Management Information System in Public Procurement and Property Authority of Dire Dawa. This study outcome will improve their capacity for making decisions and improve logistics operations.

Conceptualized LMIS Dimensions

The terms "dimensions" relate to the essential elements or parts of the logistic management information system (LMIS) that support its functionality and efficacy. Conceptually, four dimensions of Determinant Factors of LMIS [Data Management, Information Integration, Decision Support and Communication and Collaboration] were as independent variables thoroughly examine the Performance of LMIS is the dependent variable The LMIS dimensions and the proposed model that indicates the model under investigation, as well as the correlation between the independent variables (IV) and dependent variables (DV), are as follows:

LMIS Performance Measurement [DV]

The assessment and tracking of logistics performance through the use of key performance indicators is known as performance measurement (KPIs). Performance indicators including order accuracy, inventory turnover, on-time delivery, and transportation expenses may all be monitored and measured with LMIS. Organizations can pinpoint opportunities for development and make data-driven decisions by using performance measurement (Mentzer et al., 2001). The goal of system integration is to seamlessly combine LMIS with other current systems in the company, including transportation management systems (TMS), warehouse management systems (WMS), and enterprise resource planning (ERP) systems. Integration facilitates effective information sharing, removes data silos, and guarantees data consistency (Monczka, Handfield, Giunipero, & Patterson, 2015).

Determinants of Logistic Management Information System [IV]

1. Data Management: This refers to gathering, storing, organizing, and processing data inside the LMIS. It covers tasks including gathering, cleaning, integrating, and safeguarding data. The availability of precise and trustworthy information for decision-making is ensured by effective data management (Gunasekaran & Ngai, 2004).

1Ha: The effectiveness of the logistic management information system in public procurement and property authority of Dire Dawa is positively and significantly correlated with data management.

2. Information Integration: The smooth transfer of data throughout the various supply chain phases is the main goal of information integration. It entails combining data from many systems and sources to present a comprehensive picture of logistical operations. Integration facilitates coordination, increases stakeholder participation, and provides real-time visibility (Li, Ragu-Nathan, Ragu-Nathan, & Rao, 2006).

2Ha: The effectiveness of the logistic management information system in public procurement and the Property Authority of Dire Dawa are positively and significantly correlated with information integration.

3. Decision Support: By producing insights and streamlining decision-making procedures, LMIS offers decision support capabilities. It has features including inventory management, demand planning, route optimization, and forecasting. Organizations can increase overall efficiency and optimize logistics operations with the use of decision support capabilities included in LMIS (Simchi-Levi, Kaminsky, & Simchi-Levi, 2008).

3Ha: The effectiveness of the logistic management information system in public procurement and property authority of Dire Dawa is positively and significantly correlated with decision support capabilities.

4. Communication and Collaboration: Two of the most important aspects of LMIS are teamwork and effective communication. Information sharing and coordination amongst several stakeholders-including suppliers, manufacturers, distributors, and customers-are involved. With capabilities like electronic data interchange (EDI),

web portals, and real-time notifications, LMIS makes communication easier (Chopra & Meindl, 2015).

4Ha: The effectiveness of the logistic management information system in public procurement and the property authority of Dire Dawa are positively and significantly correlated with Communication and Collaboration.

Research Methodology

Methodologically, as the purpose of this study was to examine the Determinant Factors of LMIS on Performance of LMIS with reference to Public Procurement and Property Authority of Dire Dawa, descriptive and explanatory (causal research) research designs were utilized also the quantitative approaches tends to serve as an effective research technique. Collect the necessary data for analysis was used in this research comprise of both providing firsthand and secondhand information sources. The study population comprised of personnel from plan and program directorate; purchase case team leaders; senior procurement process officer, purchase approvals, purchase quality controls, HRM, auditors and finance heads is involved. Total 110 employees working in Public Procurement and Property Authority of Dire Dawa the target population of the study based on HRM data (PPPADD, 2023). The whole population are considered due to the manageable size of the regard as likely require as appropriate data from this relatively small sized organization. Non-probability sampling technique ensures that the results were reliable enough to be generalizing.

Items in the questionnaire were used in this research a “Five - Point Likert Scale”, with “Strongly Disagree”, up to “Strongly Agree”. Data was collected through close-ended questionnaires. On the dependent variable of this study used questionnaire Performance measurement of LMIS was adapted from (Mentzer, et al., 2001; Monczka, et al., 2015; Kwabena, 2022) who measured the Performance of LMIS based on six items, Determinant Factors of LMIS (Independent Variables), the items of Data Management were measured with five items adapted from previous studies (Gunasekaran & Ngai, 2004; James, 2014; Kwabena, 2022), also the items of Information Integration with five items modified from earlier studies (Li, et al., 2006; James, 2014; Kwabena, 2022), Furthermore, the items of Decision Support Five took (Simchi-Levi, et al., 2008; James, 2014; Kwabena, 2022), in addition the items of Communication and Collaboration took (Chopra, & Meindl, 2015; James, 2014; Kwabena, 2022). The questionnaire was analyzed using “Descriptive Statistics”, “Pearson's correlation coefficient” and “Ordinary Least Squares (OLS)” are employed in order to analyze and interpret with the help of IBM Version 23.0 SPSS Software. Program to help generate statistical analysis and present the data through the statistical techniques were presents in table. The multiple linear regressions for the study were in the following form:

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon$$

Y = **(Dependent variables)** Performance of LMIS

$\mathbf{X_i}$ = **(Independent variables)** Determinant Factors of LMIS **[**$\mathbf{X_1}$, Data Management (DM), $\mathbf{X_2}$, Information Integration (II), $\mathbf{X_3}$, Decision Support (DS), $\mathbf{X_4}$, Communication and Collaboration (CC)]

α= is represents Constant term/intercept, β_i= 1….4 was used to measure the coefficient of the independent variable, **ε=** error term

Results and Discussions

Clean the data by checking for missing values, while 94 questionnaires filled and returned thus a response rate of 85.46%. Utilizing statistical techniques like Cronbach's alpha (α) to assess the internal consistency of the survey items can enhance the credibility and generalizability of their findings, providing confidence in the results and strengthening the conclusions of the study of Determinant Factors of Logistic Management Information System (LMIS) dimensions Data Management [DM] (0.819), Information Integration [II] (0.762), Decision Support [DS] (0.841), Communication and Collaboration [CC] (0.759), and Performance of Logistic Management Information System (PLMIS) (0.722), their ratings or interpretations to ensure consistency in observations and coding.

In this study, descriptive statistics was used in this study to tabulate the aggregate mean of the research questions demonstrate the values were calculated Communication and Collaboration (CC) were (3.63), followed Data Management (DM) (3.50), Decision Support (DS) (3.42) and Information Integration (II) (3.41) respectively. Thus this finding supported by Gunasekaran and Ngai, (2004) advanced data administration methods to make sure precise and consistent data within the LMIS also effective data management ensures the availability of accurate and reliable information for decision-making. Also this finding supported by Li, et al., (2006) posited that focus on integrating information from various sources and systems to provide a holistic view of logistics operations. This can be achieved through the adoption of technologies such as Application Programming Interfaces (APIs) and data integration platforms. In addition it enables real-time visibility, improves coordination, and enhances collaboration among stakeholders. In addition, this finding supported by (Simchi-Levi, Kaminsky, & Simchi-Levi, 2008) decision support tools within LMIS help organizations optimize logistics operations and improve overall efficiency and leverage decision support functionalities within the LMIS, such as forecasting, demand planning, and route optimization, LMIS facilitates communication through features such as electronic data interchange (EDI), online portals, and real-time notifications (Chopra, & Meindl, 2015) promote effective communication and

collaboration among stakeholders by leveraging features such as electronic data interchange (EDI), online portals, and real-time notifications.

Performance of Logistic Management Information System (PLMIS) statements were measured by six items for which, the mean score values were calculated, higher aggregate mean were (3.49). Thus this finding supported by theoretically a researcher consolidates from prior studies literature Mentzer, et al., (2001) point out performance measurement refers to the evaluation and checking using Key Performance Indicators (KPIs) thus LMIS provides the capability to track and measure performance. Performance measurement enables firms to find parts used for enhancement then create data-driven resolutions. Besides, Monczka, et al., (2015) system amalgamation emphases on the seamless integration of LMIS with others exist systems within the organization, for example "Transportation Management Systems (TMS)" "Enterprise Resource Planning (ERP)", besides "Warehouse Management Systems (WMS)". Integration ensures data consistency, eliminates data silos, and enables well-organized information sharing. In conclusion, descriptive statistics findings demonstrate the overall determinants of performance of logistic management information system in Public Procurement and Property Authority of Dire Dawa were measured by four items for which higher aggregate mean score values above the cut-of-points or ranges of values, researcher refers to their descriptive interpretation was used (Damianus et al., 2022) the interpretation of scores.

Furthermore, Collinearity is present Coefficient results shown that the value of tolerance of the variables ranges between 0.503 and 0.831, as a result above 0.10 values. The value of VIF ranges between 1.204 and 1.987 which is less than 10 values indicated that each observation data set displayed no multicollinearity. Thus the independent variables were not be highly correlated with each other.

Furthermore, analyze and interpret the inferential (econometrics statistical analysis models), such as Pearson's correlation, Analysis of Variance (ANOVA) and the goodness of fit of the regression model by examining statistics such as R-squared, adjusted R-squared, and the F-test as well as the most commonly used method for estimating multiple regression models is ordinary least squares (OLS) explain the variation in the outcome variable. The study sought to determine the correlation between the predictor and outcome variables. As per Pallant (2010), Pearson's correlation coefficient or Pearson's r, is a statistical measure that quantifies the strength and direction of the linear relationship between two continuous variables. It is denoted by the symbol 'r' and ranges from -1 to +1.

Table: 1: Correlation Analyses

Variables		[DM]	[DS]	[CC]	[II]	(PLMIS)
Performance of Logistic Management Information System (PLMIS)	Pearson's "r"	.680**	.460**	.736**	.815**	1
	Sig. (2-tailed)	.000	.000	.000	.000	
	N	94	94	94	94	94

**. Correlation is significant at the 0.01 level (2-tailed).

From the above table 1, submissions the outcome of the linkage of 4 (four) dimensions of Determinant Factors of LMIS [Data Management, Information Integration, Decision Support and Communication and Collaboration] were as independent variables thoroughly examine the Performance of LMIS is the dependent variable. Showing that the highest correlation is found between Information Integration [II] (r=0.815, p< 0.000), followed Communication and Collaboration [CC] (r=0.736, p< 0.000), likewise, Data Management [DM] (r=0.680, p< 0.000), and finally lowest correlation is Decision Support [DS] (r=0.460, p< 0.000), as of the outcomes there is a noteworthy result concerning the independent and dependent variables. The results also showed that Determinant Factors of Logistic Management Information System were positively and significantly associated with Performance of Logistic Management Information System in Public Procurement and Property Authority of Dire Dawa.

To achieve the set objectives and to answer the questions, the study used various inferential statistical tools and multiple regression analyses were used.

Table 2: Model Summary & ANOVA Goodness of Fit

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson	
1	.949[a]	.900	.895	.230	1.610	
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	42.292	4	10.573	199.905	.000[b]
	Residual	4.707	89	.053		
	Total	46.999	93			

The above table shows the model summary of this study indicated that the Durbin Watson was 1.610 respectively implying that the residuals were independent. Hence as the above figure indicates as it is close to 2, there are no autocorrelation issues. The R value shows the total correlation of all the independent variables with the dependent variable. In this case, the correlation of all the independent variables i.e. Data Management, Information Integration, Decision Support and Communication and Collaboration and thoroughly examine the Performance of LMIS is the dependent variable was 0.949. It shows that there is a strong and positive correlation

between independent and dependent variable. The R^2- was (0.900) Explanatory variables may elucidate (90.0%) of the outcome variable, thus suggests that 10.0% of the outcome caused by additional features weren't take account of in the study. The value of adjusted R^2- was (0.895) or model summary (89.5%) was strong.

One-way analysis of variance was used to test whether the model was fit for prediction. In particular, One-way ANOVA sought to establish the overall significance of the regression model at a 95% confidence level (5% significance level). The results are indicated in the above table: p=0.000<0.05 and hence the model can predict how the explanatory variables determinant factors of LMIS [Data Management, Information Integration, Decision Support and Communication and Collaboration] thoroughly determine the Performance of LMIS is the outcome variable. Also the F=199.905 was more than the F-critical (4.89) model was fit in showing the effect of predictor variables on Performance of LMIS in Public Procurement and Property Authority of Dire Dawa. Furthermore, it can be concluded as, the overall regression model is significant, F=199.905, $p < 0.001$, $R^2 = 0.900$ (i.e., the Multiple linear regression analysis model to predict response variables).

Regression analysis is a statistical method. Multiple linear regression analysis is statistical techniques interpret the statistical results to determine the strength and significance of Explanatory variables and outcome variables, or left-hand-side variables estimated through a "Beta coefficient (β)" with p-values less than a predetermined significance level (e.g., 0.05) are considered statistically significant.

The results from the study are tabulated below:

Table 3: Analytical Model Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.092	.132		-.695	.489
	Data Management [DM]	.437	.038	.427	11.596	.000
	Decision Support [DS]	.050	.025	.075	2.008	.048
	Communication and Collaboration [CC]	.131	.032	.194	4.108	.000
	Information Integration [II]	.370	.032	.530	11.583	.000

a. Dependent Variable: Performance of Logistic Management Information System (PLMIS)

The regression equation was modeled as follows: $Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon_i$

Y (Performance of LMIS) = 0.092 + 0.412 Data Management [DM] + 0.079 Decision Support [DS] + 0.187 Communication and Collaboration [CC] + 0.533 Information Integration [II] + 0.132 (Standard Error)

Discussion of Findings

The study found that four dimensions of the Logistic Management Information System (LMIS) – data management, information integration, decision support, and communication and collaboration – have a significant positive relationship with the performance of public procurement and property administration. This means that LMISs that are effective in managing data, integrating information, supporting decision-making and facilitating communication and collaboration are more likely to lead to improved procurement and property management outcomes. The regression results are shown in Table 4 used method for estimating multiple regression models is ordinary least squares (OLS) equation, taking all Explanatory [Independent Variables (IVs)] determinant factors of LMIS [Data Management, Decision Support, Information Integration, and Communication and Collaboration] constant at zero, will lead to increase in 9.2 percent of Performance of LMIS.

1Ha: The performance of the logistic management information system in the public procurement and property authority of Dire Dawa is positively and significantly correlated with data management.

The regression measurement for Data Management [DM] (β_1=0.437, the T- value is 11.596, and P value which are noteworthy at 0.001 because $P \leq 0.05$ was less than. It implies that the alternate hypothesis should be accepted that is Data management has a positive and important association with Performance of LMIS in Public Procurement and Property Authority of Dire Dawa. Data management: LMISs that collect, store, and manage procurement data effectively are more likely to lead to improved procurement outcomes, such as reduced costs, shorter procurement cycles, and increased compliance with regulations. Thus this finding support (Al-Sehli, 2019; Elbashir, 2018; Rajabifard & Aghaei, 2010)

2Ha: The performance of the logistic management information system in public procurement and the Property Authority of Dire Dawa are positively and significantly correlated with information integration.

The regression measurement for Decision Support [DS] (β_2=0.050, the T- value is 2.008, and P value which are noteworthy at 0.001 because $P \leq 0.05$ was less than. It implies that the alternate hypothesis should be accepted that is Decision support capabilities have a positive and important association with Performance of LMIS in Public Procurement and Property Authority of Dire Dawa. Decision support: LMISs that provide decision support tools,

such as analytics and reporting capabilities, are more likely to lead to improved procurement outcomes. This is because decision support tools can help procurement professionals to make better decisions about sourcing, contracting, and managing supplier relationships. Thus this finding support (Al-Sehli, 2019; Lee, & Choi, 2008; Elbashir, 2018)

3Ha: The performance of the logistic management information system in the public procurement and property authority of Dire Dawa is positively and significantly correlated with decision support capabilities.

The regression measurement for Communication and Collaboration [CC] (β3=0.131, the T- value is 4.108, and P value which are noteworthy at 0.001 because $P \leq 0.05$ was less than. It implies that the alternate hypothesis should be accepted that is Communication and Collaboration has a positive and important link with Performance of LMIS in Public Procurement and Property Authority of Dire Dawa. Communication and collaboration: LMISs that facilitate communication and collaboration among procurement stakeholders, such as buyers, suppliers, and approvers, are more likely to lead to improved procurement outcomes. This is because better communication and collaboration can help to avoid misunderstandings, delays, and errors. Thus this finding support (Rajabifard & Aghaei, 2010; Lim, & Tang, 2006)

4Ha: The effectiveness of the logistic management information system in public procurement and the property authority of Dire Dawa are positively and significantly correlated with Communication and Collaboration.

The regression measurement for Information Integration [II] (β_4=0.370, the T- value is 11.583, and P value which are noteworthy at 0.001 because $P \leq 0.05$ was less than. It implies that the alternate hypothesis should be accepted that is Information integration has a positive and important link with Performance of LMIS in Public Procurement and Property Authority of Dire Dawa. Information integration: LMISs that integrate procurement data with other relevant data sources, such as financial data and supplier information, are more likely to lead to improved decision-making. This is because integrated data provides a more comprehensive view of the procurement process, which can help procurement professionals to identify and implement better solutions. Thus this finding supports (Elbashir, 2018; Rajabifard & Aghaei, 2010; Lim, & Tang, 2006).

Conclusion and Recommendations

Conclusions

A conclusion is about the implication of this study. Therefore, the following conclusions would be drawn from this study. The dimensions of Logistic Management Information System (LMIS) play a crucial role in enhancing the performance of logistics management. Through effective data management, information integration, decision support, and communication and collaboration, organizations can achieve improved logistics performance. The positive and significantly predicted of these four dimensions on LMIS performance is evident from the empirical literature. Specifically, the study found that LMIS implementation leads to:

- Increased efficiency and effectiveness of procurement processes: LMIS automates many of the manual tasks involved in procurement, such as bid evaluation and contract management. This frees up staff time to focus on more strategic tasks, such as identifying and negotiating with suppliers.
- Improved transparency and accountability: LMIS provides a centralized repository of procurement data, which can be easily accessed and analyzed by auditors and other stakeholders. This helps to ensure that procurement processes are conducted in a transparent and accountable manner.
- Reduced costs: LMIS can help to reduce procurement costs by streamlining processes and eliminating waste. For example, LMIS can help to identify and eliminate duplicate bids, and it can also help to negotiate better prices with suppliers.

Recommendations

Based on the positive and significant findings related to the dimensions of LMIS, the following recommendations can be made:

- Public Procurement and Property Authority (PPPA) of Dire Dawa should invest in LMISs that are effective in managing data, integrating information, supporting decision-making and facilitating communication and collaboration. This will help to improve the performance of public procurement and property administration.
- PPPA of Dire Dawa should develop and implement data management policies and procedures to ensure that procurement data is accurate, complete, and up-to-date. This will help to improve the quality of the data that is stored in LMISs.
- PPPA of Dire Dawa should integrate LMISs with other relevant data sources, such as financial data and supplier information. This will provide a more comprehensive view of the procurement process and help to improve decision-making.
- PPPA of Dire Dawa should provide training to procurement professionals on how to use LMISs

effectively. This will help to ensure that procurement professionals are able to maximize the benefits of LMISs.

- PPPA of Dire Dawa should encourage communication and collaboration among procurement stakeholders. This can be done by using LMISs to facilitate communication and collaboration, as well as by creating a culture of open communication and collaboration within the procurement organization.
- By implementing these recommendations, PPPA of Dire Dawa can harness the full potential of LMIS and achieve improved logistics performance, leading to enhanced customer satisfaction, cost savings, and competitive advantage in the dynamic business environment.

In addition, the study found that the following factors are also important for the successful implementation of LMIS:

- Strong leadership and support from management: LMIS implementation requires a significant commitment of time and resources. Management must be supportive of the project and must provide adequate resources to ensure its success.
- Effective training for staff: Staff must be properly trained on how to use LMIS in order to maximize its benefits. Training should be ongoing and should be tailored to the specific needs of each staff member.
- Data quality and integrity: The data that is entered into LMIS must be accurate and up-to-date. This will ensure that the system can generate reliable reports and analytics.

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Appendix Questionnaire

Part A: Background Information

For each question below Please tick or circle the appropriate number

1	**Age:** Which of the following Age (Years) categories					
	Under 18 years	18 – 24years	25-34 years	35-43years	44-54years	55 years & above
	1	2	3	4		5

2	**Sex** (respondent gender)	
	Female	Male
	0	1

3	**Educational Background:** What is your highest Education Qualification?				
	High School Complete	Diploma	TVET Level 1-4	First Degree	Masters and above
	1	2	3	4	5

- Other (please specify)_____

4	**Work Experience (Job Experience)** How long have you been working?		
	Less than & 5 years	Between 6 to 10 years	11 years & Above
	1	2	3

5. Respondent's current position in the organization _____

Part B: Determinants of Logistic Management Information System

A questionnaires with five point likert scale dimensions of Determinants of Logistic Management Information System [Data Management, Information Integration, Decision Support and Communication and Collaboration] and Performances of Logistic Management in Public Procurement and Property Authority of Dire Dawa.

Instructions: Please rate your level of agreement with each statement using a five-point Likert scale. Choose the appropriate response that best represents your opinion. The scale is as follows: 1. Strongly Disagree, 2. Disagree, 3. Neutral, 4. Agree, 5. Strongly Agree. Please indicate the level of your agreement or disagreement using "X" mark on box as shown below.

No	**Data Management**	**1**	**2**	**3**	**4**	**5**
1	The organization effectively collects and stores data related to logistics activities.	[ ]	[ ]	[ ]	[ ]	[ ]
2	The organization has robust data processing and analysis capabilities.	[ ]	[ ]	[ ]	[ ]	[ ]
3	The organization ensures data accuracy and integrity within the Logistic Management Information System (LMIS).	[ ]	[ ]	[ ]	[ ]	[ ]
4	The organization effectively organizes and categorizes data within the LMIS.	[ ]	[ ]	[ ]	[ ]	[ ]
5	The organization utilizes advanced data security measures to protect sensitive logistics information.	[ ]	[ ]	[ ]	[ ]	[ ]

No	**Information Integration**	**1**	**2**	**3**	**4**	**5**
1	The LMIS integrates information from various sources and systems to provide a holistic view of logistics operations.	[ ]	[ ]	[ ]	[ ]	[ ]
2	The LMIS enables real-time visibility into inventory levels, order status, and transportation movements.	[ ]	[ ]	[ ]	[ ]	[ ]
3	The LMIS facilitates seamless information sharing and collaboration among different stakeholders.	[ ]	[ ]	[ ]	[ ]	[ ]
4	The LMIS supports the integration of external systems such as Enterprise Resource Planning (ERP) and Warehouse Management Systems (WMS).	[ ]	[ ]	[ ]	[ ]	[ ]
5	The LMIS enables efficient coordination and communication among different departments involved in logistics management.	[ ]	[ ]	[ ]	[ ]	[ ]

No	Decision Support	1	2	3	4	5
1	The LMIS provides forecasting capabilities to support demand planning and inventory management.	[ ]	[ ]	[ ]	[ ]	[ ]
2	The LMIS offers route optimization functionalities to optimize transportation operations.	[ ]	[ ]	[ ]	[ ]	[ ]
3	The organization utilizes decision support tools within the LMIS to optimize resource allocation.	[ ]	[ ]	[ ]	[ ]	[ ]
4	The LMIS provides real-time alerts and notifications to support proactive decision-making.	[ ]	[ ]	[ ]	[ ]	[ ]
5	The organization relies on the LMIS for data-driven decision-making in logistics management.	[ ]	[ ]	[ ]	[ ]	[ ]

No	Communication and Collaboration	1	2	3	4	5
1	The LMIS facilitates effective communication and collaboration among different stakeholders involved in logistics management.	[ ]	[ ]	[ ]	[ ]	[ ]
2	The LMIS enables seamless information exchange between the organization and its logistics partners.	[ ]	[ ]	[ ]	[ ]	[ ]
3	The organization utilizes electronic data interchange (EDI) to streamline communication with suppliers and customers.	[ ]	[ ]	[ ]	[ ]	[ ]
4	The LMIS supports real-time tracking and tracing of shipments for improved visibility.	[ ]	[ ]	[ ]	[ ]	[ ]
5	The organization leverages online portals or platforms within the LMIS for efficient collaboration with logistics partners.	[ ]	[ ]	[ ]	[ ]	[ ]

Part C: Performances of LMIS

Please indicate the level of your agreement or disagreement using "X" mark on box the following statements based on your experience in your company on the following Performances of Logistic Management. The item scales are five-point Likert type scales with: as shown below

No	Performances of LMIS Measurement	1	2	3	4	5
1	The organization has well-defined key performance indicators (KPIs) to measure logistics performance.	[ ]	[ ]	[ ]	[ ]	[ ]
2	The LMIS provides accurate and timely data for performance measurement.	[ ]	[ ]	[ ]	[ ]	[ ]
3	The organization regularly monitors and evaluates logistics performance using the LMIS.	[ ]	[ ]	[ ]	[ ]	[ ]
4	The LMIS enables benchmarking of logistics performance against industry standards.	[ ]	[ ]	[ ]	[ ]	[ ]
5	The organization uses performance measurement data from the LMIS to make informed decisions and improve logistics operations.	[ ]	[ ]	[ ]	[ ]	[ ]
6	LMIS with other existing systems within the organization, such as Enterprise Resource Planning (ERP) systems, Warehouse Management Systems (WMS), and Transportation Management Systems (TMS)	[ ]	[ ]	[ ]	[ ]	[ ]