

AFRICA UNIVERSITY

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ENHANCING VEHICLE INSPECTION EFFICIENCY WITH
ENTERPRISE RESOURCE PLANNING (ERP) INTEGRATION. A
CASE STUDY OF VEHICLE INSPECTION DEPARTMENT (VID)
ZIMBABWE

BY

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A RESEARCH PROJECT SUBMITTED TO THE COLLEGE OF ENGINEERING
AND APPLIED SCIENCES IN PARTIAL FULFILLMENT OF THE
REQUIREMENTS FOR THE DEGREE OF BACHELOR OF SCIENCE IN
COMPUTER INFORMATION SYSTEMS (HONOURS)

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Abstract

To improve the efficacy and efficiency of vehicle inspection procedures, this research project investigated the integration of Enterprise Resource Planning (ERP) systems inside Zimbabwe's Vehicle Inspection Department (VID). Road safety and regulatory compliance are jeopardized by the present manual-based systems and disjointed processes inside the VID, which create serious obstacles like delays, inaccuracies, and restricted access to real-time information. By integrating the ERP system, this study seeks to resolve these problems and improve the VID's overall performance. The study investigated the perspectives, experiences, and difficulties that stakeholders have with ERP integration using a qualitative methodology. The viewpoints of stakeholders have been investigated through interviews and questionnaires. To inform the examination of ERP integration dynamics within the VID, the study's theoretical approach integrated ideas from the Resource-Based View (RBV), Institutional Theory, Technology Acceptance Model (TAM), and Change Management Models. The research seeks to shed light on the variables impacting ERP adoption and implementation as well as the possible advantages for organizational effectiveness and efficiency by integrating theoretical ideas with empirical data and real-world applications. Informed consent, confidentiality, and data security protocols are in place to protect participants' rights and privacy throughout the research process, and ethical concerns are of the utmost importance. Furthermore, the study methodology guarantees that a variety of stakeholders, including as employees, supervisors, IT specialists, and government agencies, are represented in the VID. It is anticipated that the research's conclusions will add to the body of information already available on the use of ERP systems and organizational change management in government. The VID and other similar organizations around the world may use the study's practical insights to guide organizational goals, policy choices, and technology adoption procedures. The objective of this research project is to enhance road safety, regulatory compliance, and organizational efficiency by means of a methodical investigation of ERP integration inside Zimbabwe's Vehicle Inspection Department (VID). The study aims to offer practical suggestions for improving the efficiency of vehicle inspection procedures and fostering public sector innovation through thorough data gathering, analysis, and interpretation.

Keywords: Enterprise Resource Planning (ERP), Efficiency, Productivity, Case Study (Vehicle Inspection Department Zimbabwe), Implementation and Use of ERP systems.

Declaration

I CHIDO FELISTAS CHAYIRA hereby declare that this research project for Bachelor of Sciences Honours in Computer Information Systems submitted to the College of Engineering and Applied Sciences at Africa University has not been submitted previously for any degree at this or another university. It is original in design and in execution, and all reference material contained therein has been duly acknowledged.

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Dedication Page

This research is dedicated to my mother Joyline Chayira, Father Wellington Chayira and siblings Tisha, Nicole and Anotida Chayira

This is also for my friends Chelsy Sara, Nyasha Chinganyama, Lashee Kanyumwa, Yowana Kapere, Morris Bangezhano, Rukudzo Makuwaza, Nyasha Shantel, Kudakwashe Nemacha, Munyaradzi Nkoma, Tadiwanashe Sonono

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List of Acronyms and Abbreviations

VID – Vehicle Inspection Department

ERP - Enterprise Resource Planning

PSC - Public Service Commission

TAM - Technology Acceptance Model

UTAUT- Unified Theory of Acceptance and Use of Technology

RBV- Resource-Based View

BPR - Business Process Reengineering

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Chapter 1

1.1 Introduction

An enterprise resource planning (ERP) system is at the centre of an institution (Greengard, 2019). It tackles the core tasks of managing and integrating business processes in real-time. In today's fast-paced world, the efficient management of resources and processes is important for organizational success. This is particularly true in industries such as a transportation, where safety and compliance are of paramount importance. The vehicle inspection plays a critical role in ensuring roadworthiness, safety and environmental compliance. However, the traditional methods employed in vehicle inspection departments (VID's) often result in a lot of inefficiencies, delays and errors. To address these challenges which are because of manual methods being used, the integration of Enterprise Resource Planning (ERP) systems offers promising solutions.

An Enterprise Resource Planning (ERP) system comprises several modules, each designed to manage specific aspects of an organization's operations. These modules work in an integrated manner, sharing data across departments to streamline processes, enhance efficiency, and improve decision-making. In the context of a Vehicle Inspection Department (VID), the implementation of ERP modules can significantly optimize operations by automating routine tasks and enabling real-time data management. Below are some key ERP modules relevant to the VID and an explanation of how they can enhance operational efficiency:

The Inventory Management module helps monitor and manage the VID's inventory of inspection equipment, spare parts, and other resources. This module ensures that the department maintains optimal stock levels, reducing downtime caused by a lack of necessary

equipment. It automates the tracking of usage, reordering processes, and supplier management, thus ensuring that the tools and materials required for vehicle inspections are always available. For instance, this module can notify managers when inspection equipment requires maintenance or replacement, helping avoid delays in the inspection process.

The HRM module manages employee data, including recruitment, payroll, performance tracking, and training records. In a VID, this module can be used to schedule inspectors, monitor their performance, and ensure they receive proper certification and ongoing training to maintain compliance with regulatory standards. The system can also manage shifts and workloads, ensuring that the right number of inspectors are available at peak times, thereby reducing bottlenecks in vehicle inspection scheduling.

The Finance and Accounting module is essential for managing the financial aspects of the VID's operations. It handles tasks such as billing vehicle owners for inspection services, processing payments, managing budgets, and generating financial reports. This module allows for greater transparency and accuracy in the financial management of the department, as all transactions are tracked in real-time. It also integrates with other modules to ensure that expenses, such as purchasing inventory or paying staff, are aligned with the VID's financial goals and regulations.

The CRM module focuses on managing interactions with customers, in this case, vehicle owners, transport companies, and other stakeholders. It can automate the scheduling of inspections, send reminders to customers about upcoming inspections or deadlines, and provide a portal where customers can access their vehicle's inspection history and reports. By improving communication and service delivery, the CRM module enhances customer satisfaction and fosters a more organized approach to managing relationships with key stakeholders.

For a VID, compliance is a critical function, ensuring that all inspections are conducted according to national road safety and environmental regulations. The Compliance Management module tracks regulatory changes and ensures that all inspections meet the required standards. It generates reports to demonstrate compliance and flags any discrepancies that might arise during inspections. This module also stores records of all inspections conducted, allowing for audits and reviews by regulatory authorities, thus ensuring transparency and accountability.

The Procurement module manages the acquisition of goods and services, from requesting quotes from suppliers to finalizing orders and payments. Within the VID, this module can help in the procurement of spare parts, equipment, and office supplies needed for operations. The automation of procurement ensures that the department can efficiently source what it needs without unnecessary delays, while also tracking supplier performance and costs to maintain budgetary control.

The Reporting and Analytics module generates detailed reports and provides insights into the operational performance of the VID. It allows managers to access real-time data on inspection volumes, employee productivity, customer satisfaction, and financial performance. This module supports decision-making by providing key performance indicators (KPIs) and analytical tools to identify trends, inefficiencies, or areas requiring improvement. For example, management can track the average time it takes to complete inspections or identify periods of peak demand, helping to optimize resource allocation.

The Maintenance Management module is critical for scheduling and tracking maintenance activities for inspection equipment and the department's fleet of vehicles. It ensures that all equipment is regularly serviced and operating at optimal levels. In a VID, this module can be used to monitor the condition of tools used for inspections and track service history, reducing the risk of equipment failure and ensuring the accuracy of inspections.

The Document Management module handles the storage and retrieval of documents, such as inspection reports, certificates, and compliance records. In a VID, this module enables the department to store all inspection-related documents in a centralized system, reducing the reliance on paper-based records and improving accessibility. Inspectors and managers can quickly retrieve historical data, ensuring that documentation is complete and readily available for audits or customer inquiries.

This module tracks the VID's assets, including vehicles, inspection equipment, and IT infrastructure. It records the purchase, maintenance, depreciation, and disposal of assets. By keeping detailed records of each asset, the VID can ensure that all equipment is in good working condition and that replacements or upgrades are made when necessary. This module also helps in budgeting for future asset purchases and managing the life cycle of existing assets.

In the context of the Vehicle Inspection Department, integrating these ERP modules would provide a comprehensive solution for automating processes, reducing errors, and ensuring compliance with regulations. For example, the integration of the CRM, Finance, and Compliance Management modules would streamline the inspection process from customer booking to payment and compliance reporting. Additionally, the combination of the HRM and Reporting modules would enable the department to optimize staff allocation based on real-time data, further enhancing operational efficiency.

By leveraging these ERP modules, the VID can create a more responsive, data-driven environment that reduces inefficiencies, enhances customer service, and ensures strict adherence to regulatory standards. Ultimately, the integration of ERP systems has the potential to transform the operations of the Vehicle Inspection Department, leading to a safer, more compliant, and more efficient transportation system in Zimbabwe.

This research investigates the potential benefits and challenges of integrating ERP systems into the operations of the Vehicle Inspection Department (VID) in Zimbabwe.

1.2 Background to the study

In today's fiercely competitive business environment, organizations are searching for methods to boost their productivity and efficiency to surpass their competitors. One method for achieving this goal is the adoption of an enterprise resource planning (ERP) system. In its simplest form, ERP systems are integrated software applications that enable companies to effectively and efficiently manage their business activities.

An ERP system is a "packaged business software system that allows a company to automate and integrate the majority of its business processes, share common data and practices across the entire enterprise, and produce and access of information in a real-time environment," as defined by (Davenport, 1998). ERP systems have become very popular over the past year, with many businesses implementing them to increase productivity and efficiency.

The Vehicle Inspection Department (VID) in Zimbabwe is responsible for ensuring that all vehicles meet safety and regulatory standards before they are allowed to move on the roads. However, the VID faces several challenges in its operations which include manual record-keeping, prolonged inspection times, data redundancy and limited access to information in real time. These challenges do not only affect the efficiency of the VID, but they also compromise road safety and regulatory compliance.

ERP systems are a suite of software solutions which are designed to streamline and integrate business processes across different departments within an organization. By integrating functionalities like inventory management, data analytics, scheduling and reporting, ERP systems have the potential to revolutionize the operations of the VID. However, the adoption

of ERP systems in government institutions, mainly for example in developing countries such as Zimbabwe, comes with its own set of challenges which are financial constraints, technological infrastructure limitations and organizational resistance to change.

1.3 Statement of the problem

Vehicle Inspection Department (VID) is a government department under the Ministry of Transport & Infrastructural Development and operates under the auspices of the Public Service Commission (PSC) (Ministry of Transportation & Infrastructure Development, n.d.). The VID in Zimbabwe plays an important role in ensuring road safety and regulatory compliance by inspecting vehicles to verify if they are roadworthy and adhere to the established standards. However, the current manual processes and fragmented systems utilized by the VID present significant challenges that hinder its effectiveness and efficiency.

The primary problems faced by the VID is the reliance on manual record-keeping and the documentation processes. Paper—based systems are highly prone to errors, data redundancy and as well as inefficiencies which lead to delays in vehicle inspection procedures. Moreover, the manual handling of records makes it difficult to track and retrieve information which results in prolonged inspection times and customer dissatisfaction.

Furthermore, the lack of integration between different departments within the VID also enhances the problem. For example, information that is collected during vehicle inspections may not be seamlessly shared with other relevant departments, such as licensing or enforcement units. This lack of integration not only disrupts communication and collaboration, but it also leads to inconsistencies and inaccuracies in data management.

The restricted availability of real-time data and reporting features is another important problem. The VID's capacity to make fast decisions and react to new developments in vehicle safety and compliance is hampered in the absence of quick access to reliable data.

The issue is further complicated by the fact that various inspection centres lack consistent protocols and procedures. The legitimacy and dependability of the VID's operations can be compromised by differences in inspection outcomes caused by disparities in inspection centre methods and standards.

Furthermore, it is difficult to efficiently monitor and enforce regulatory compliance with the VID due to its reliance on human processes. Road safety and public confidence in the VID's mission could be jeopardized in the absence of automated methods for monitoring and auditing inspection activities. This is because there is a chance of oversight and non-compliance with established regulations.

In summary, inefficiencies, errors, and a lack of transparency define the status of vehicle inspection activities inside the VID. These difficulties not only make it difficult for the VID to carry out its regulatory duties, but they also endanger public welfare and road safety. There is an urgent need to investigate other strategies that can modernize and expedite the VID's vehicle inspection procedures considering these urgent problems. A potential remedy for the drawbacks of the existing manual-based systems and an increase in the general efficacy and efficiency of the VID's operations is the integration of ERP systems. Though more research and analysis are necessary, the viability, advantages, and difficulties of ERP integration in the context of Zimbabwe's VID are all worth considering.

1.4 Justification/Rationale of the Study

The integration of Enterprise Resource Planning (ERP) systems in organizations has proven to significantly enhance operational efficiency, streamline processes, and reduce human errors. This is especially important for the Vehicle Inspection Department (VID) in Zimbabwe, where ensuring road safety and compliance with environmental regulations is critical. The current

manual processes in the VID often lead to inefficiencies, such as delays in inspections, inaccurate record-keeping, and difficulties in managing compliance with safety standards. These challenges not only impact the department's effectiveness but also pose risks to road safety and environmental sustainability.

Given the growing volume of vehicles on the roads and the increasing demand for timely and accurate inspections, there is a pressing need for more efficient systems within the VID. The integration of an ERP system can provide solutions by automating tasks, improving data accuracy, and offering real-time insights into the department's operations. Moreover, this study is necessary to identify specific ways in which ERP systems can address the unique challenges faced by the VID in Zimbabwe, providing a framework for successful implementation.

By investigating the potential benefits and challenges of ERP integration, this research aims to offer actionable recommendations that can improve the VID's operational efficiency, reduce the risk of human errors, and enhance regulatory compliance. This study also seeks to contribute to the body of knowledge on ERP systems within the public sector, particularly in developing countries, where technological adoption may face financial and infrastructural constraints. Understanding the dynamics of ERP implementation in the VID will not only benefit the department but also provide insights that can be applied to other public institutions in Zimbabwe and beyond.

The findings of this research will be valuable for policymakers, VID management, and other stakeholders in the transportation sector, offering evidence-based solutions to enhance the effectiveness of vehicle inspections and ultimately contribute to safer roads and a cleaner environment in Zimbabwe.

1.5 Research Objectives

The main aim of this research project is to examine the possible advantages and difficulties of integrating ERP systems into the operations of Zimbabwe's VID. The specific goals of this research are as follows:

1. To examine the current vehicle inspection processes and identify existing challenges within the Vehicle Inspection Department (VID) in Zimbabwe.
2. To explore the functionalities and capabilities of Enterprise Resource Planning (ERP) systems and their relevance to the context of vehicle inspection.
3. To assess the potential benefits of ERP integration in enhancing the efficiency, accuracy, and effectiveness of vehicle inspection processes.
4. To identify the barriers and challenges associated with the adoption and implementation of ERP systems within the Vehicle Inspection Department (VID) in Zimbabwe.

1.6 Research Questions

The following research questions will direct this research to accomplish the above specified goals:

1. What are the current vehicle inspection processes employed by the Vehicle Inspection Department (VID) in Zimbabwe, and what are the main challenges associated with these processes?
2. What are the key functionalities and capabilities of Enterprise Resource Planning (ERP) systems, and how can they be leveraged to improve vehicle inspection processes?
3. What are the potential benefits of integrating ERP systems into the operations of the Vehicle Inspection Department (VID) in terms of efficiency, accuracy, and effectiveness?

4. What are the barriers and challenges hindering the adoption and implementation of ERP systems within the Vehicle Inspection Department (VID) in Zimbabwe?

The researcher was able to establish the following hypotheses:

(H0): There is no significant improvement in the efficiency of vehicle inspection processes with the integration of Enterprise Resource Planning (ERP) systems in the Vehicle Inspection Department (VID) in Zimbabwe.

(H1): There is a significant improvement in the efficiency of vehicle inspection processes with the integration of Enterprise Resource Planning (ERP) systems in the Vehicle Inspection Department (VID) in Zimbabwe.

1.7 Operational definition of key points and definitions

ERP refers to a type of software used by organizations to manage and integrate the important parts of their businesses. An ERP system integrates various functions such as finance, human resources, procurement, and inventory management into a single unified system that can be accessed in real-time, streamlining operations and improving efficiency.

The VID is a government department responsible for ensuring that all vehicles on public roads meet certain safety and environmental standards. In Zimbabwe, the VID conducts vehicle inspections to assess roadworthiness, emissions compliance, and overall safety.

Efficiency in this context refers to the ability to carry out vehicle inspection tasks in the shortest possible time while minimizing errors, resource wastage, and delays. It also involves optimizing workflows to ensure that inspections are completed accurately and in compliance with regulations.

Integration refers to the process of combining different systems or components so that they function together as a cohesive unit. In this study, integration specifically refers to the

incorporation of ERP systems into the existing operations of the VID to unify processes like scheduling, inventory management, and reporting.

Compliance refers to adhering to established laws, regulations, and standards, particularly concerning road safety and environmental protection. In the context of this study, compliance involves ensuring that vehicles inspected by the VID meet all safety and environmental regulations.

Operational inefficiencies are situations where processes within the VID are slow, prone to errors, or unnecessarily complex, leading to delays in inspections, increased costs, and reduced effectiveness in enforcing road safety and environmental regulations.

Manual processes refer to tasks that are carried out by hand or through traditional methods, often involving paperwork, which are prone to human error, time-consuming, and inefficient compared to automated or digital systems.

Automation involves using technology to perform tasks that would otherwise require human intervention. In this study, automation through ERP systems refers to tasks such as scheduling inspections, generating reports, and managing data with minimal human involvement.

Stakeholders refer to individuals or groups who are affected by or have an interest in the VID's operations, including vehicle owners, inspectors, management, policymakers, and the public.

Data accuracy refers to the precision and correctness of the information collected and used during vehicle inspections. High data accuracy ensures that inspection records are reliable, which is essential for compliance and reporting.

Challenges refer to the obstacles or difficulties encountered when implementing ERP systems within an organization, such as cost, resistance to change, lack of technical skills, and infrastructural limitations.

These definitions will provide a clear understanding of the key concepts discussed throughout the study and ensure consistency in interpreting terms during the research process.

1.8 Assumptions

This research is based on the following assumptions:

1. The integration of ERP systems will improve the efficiency and effectiveness of vehicle inspection processes within the VID in Zimbabwe.
2. Stakeholders within the VID are willing to embrace technological advancements and organizational change for the improvement of operations.
3. Sufficient financial resources and technological infrastructure will be available to support the adoption and implementation of ERP systems within the VID.

1.9 Significance of the study

The findings of this research will have several significant implications:

1.9.1 To participators and community

The community and stakeholders in the transportation industry will be directly impacted by Zimbabwe's VID operations integrating ERP technology. This research can help raise the bar for road safety regulations by improving the effectiveness and precision of car inspection procedures. Less accidents, injuries, and fatalities result from safer cars on the road, which benefits not just car owners but also pedestrians and other users of the road.

Moreover, more efficient inspection processes could result in shorter wait times and customer satisfaction, which would improve the whole experience for those looking for car inspection services. After all, the community will benefit from safer roads and a more dependable transportation system because of the VID's increased efficacy in carrying out its regulatory duty.

1.9.2 To the researcher

This study offers the researcher a chance to advance their career development. Researching the integration of ERP systems in an actual setting, like Zimbabwe's VID, provides invaluable hands-on knowledge in the fields of organizational management and information technology. The researcher will improve their analytical and problem-solving abilities through interacting with stakeholders, obtaining information, and interpreting findings. Additionally, by adding to the body of information about the deployment of ERP systems and their effects on public sector companies, the researcher can position themselves as an authority in the topic, opening doors for further study and professional development.

1.9.3 To academia

From an academic standpoint, this study contributes to the corpus of research already written about technology adoption, organizational change management, and ERP systems in the public sector. Theories and models pertaining to the adoption of technology and the spread of innovation can benefit from the knowledge gathered from researching the incorporation of ERP systems into the VID operations in Zimbabwe. Furthermore, the study's empirical results support evidence-based decision and practice in the fields of information systems and public administration. This research supports information sharing among researchers, educators, and practitioners globally by enhancing scholarly discourse and disseminating research findings through academic publications and conferences.

1.10 Delimitation of the study

This research is delimited in the following ways:

1.10.1 Scope of the study

1.10.1.1 Content Scope

The main objective of the study is to examine how Zimbabwe's VID integrates ERP technology into its operations. It specifically looks at the advantages, difficulties, and consequences of integrating ERP to improve the efficacy and efficiency of vehicle inspection procedures. The major focus of the discussion is still ERP integration in the context of vehicle inspection in Zimbabwe, even though related subjects like organizational change management, technology adoption, and public sector innovation may be included.

1.10.1.2 Geographical Scope

This study's geographic focus is restricted to Zimbabwe and the activities of the VID. Vehicle inspection departments in other nations or regions may not find direct application in the data gathering, analysis, and conclusions due to their confinement to the unique setting of the VID. Although this research may yield insights that are more broadly applicable to similar organizations worldwide, comparison studies across other geographic regions are not included in this study.

1.10.1.3 Time Scope

The research is carried out within a defined time frame, and temporal constraints affect the procedures for data gathering, analysis, and reporting. The study's conclusions and findings are predicated on the circumstances, procedures, and difficulties that the VID in Zimbabwe faced when gathering data. Changes or developments that take place after the study period might not be included in this research's scope or adequately documented.

1.10.1.4 Competitors Scope

The VID is the primary subject of this study, however other vehicle inspection providers and regulatory agencies operating in Zimbabwe are acknowledged. It is outside the purview of this

research to investigate competitors' unique organizational structures, technologies, and procedures, such as those of private inspection firms or alternative regulatory bodies. As a result, neither competitive analyses nor comparisons with other organizations involved in Zimbabwe's vehicle inspection industry are covered in detail in this study.

1.11 Limitations of the Study

Despite careful planning and execution, this research is subject to several limitations that may affect the interpretation and generalizability of its findings. These limitations include:

Sample Size and Representativeness: The VID in Zimbabwe provided data from a certain sample of participants, from which the study's conclusions were derived. The sample size and makeup could not accurately reflect the range of viewpoints, behaviours, and difficulties that exist within the company. As a result, care should be taken when extrapolating the results to the VID as a whole or to other similar organizations.

Data Availability and Reliability: Throughout the study process, issues with data dependability and availability may arise. Incomplete datasets, inconsistent data documentation within the VID, or restricted access to historical information could all influence how accurate and thorough the study is. Furthermore, the use of participant self-reported data may bring biases or mistakes into the results.

Resource Constraints: The time, money, and technical limits placed on the research are a result of the resources at hand. These restrictions might have an impact on the study's breadth and depth, which could result in gaps in the gathering, processing, or interpretation of data. Furthermore, a researcher's capacity to use methodological strategies or pursue new research directions may be restricted by resource limitations.

External Factors and Contextual Dynamics: The study is carried out in a constantly changing external environment that is impacted by technological, sociopolitical, and economic variables. Throughout the research period, modifications to laws, regulations, or technology could influence how applicable and relevant the results are. Furthermore, organizational dynamics could affect how ERP integration projects are implemented and turn out, including shifts in leadership or measures to restructure the VID.

Bias and Subjectivity: Inherent subjectivities and biases may affect data collection, analysis, and interpretation even in the face of efforts to uphold objectivity and rigor in the research process. The development of research questions, choice of techniques, and interpretation of findings may be influenced by the experiences, viewpoints, and background of the researcher. The results of surveys or interviews may also be skewed by participant bias or social desirability effects, which could influence the responses given.

Scope Limitations: The precise research objectives, hypotheses, and delimitations listed in the research project determine the study's scope. Therefore, the scope of this study may not allow for a thorough examination of all facets of ERP integration in vehicle inspection, such as long-term sustainability issues or technical implementation specifics. These aspects might be included in future research to give a more thorough understanding of the topic.

It is imperative to acknowledge these limitations to appropriately assess the study's findings and contextualize their consequences. Notwithstanding these limitations, the study intends to add to the body of knowledge on technology adoption and organizational innovation in the public sector by offering insightful analyses of the possible advantages and difficulties of ERP integration within the VID in Zimbabwe.

2 Chapter 2: Literature review-

2.1 Introduction

The literature review serves as a critical component of this research, providing a comprehensive overview of existing knowledge, theories, and empirical studies relevant to the integration of Enterprise Resource Planning (ERP) systems in the context of vehicle inspection departments. This chapter explores theoretical frameworks, empirical evidence, and best practices to inform the understanding of ERP integration challenges, benefits, and implications for organizational efficiency and effectiveness within VID in Zimbabwe.

2.2 Theoretical Framework

This study's theoretical framework will be provided by the body of existing literature on ERP systems and their impact on business operations. ERP systems help with better resource allocation and decision-making by integrating several organizational functional areas, such as supply chain management, operations, and finance, into a single system. Manufacturing, services, and healthcare are just a few of the industries in which the literature indicates that ERP systems have a major impact on production, efficiency, and profitability. However, the transportation industry has paid less attention to the effectiveness of ERP systems, and the published research to far yield inconsistent results. Several theoretical frameworks provided support for this study. A person's acceptance and usage of technology are based on how easy and beneficial they believe it to be, according to the Technology Acceptance Model (TAM).

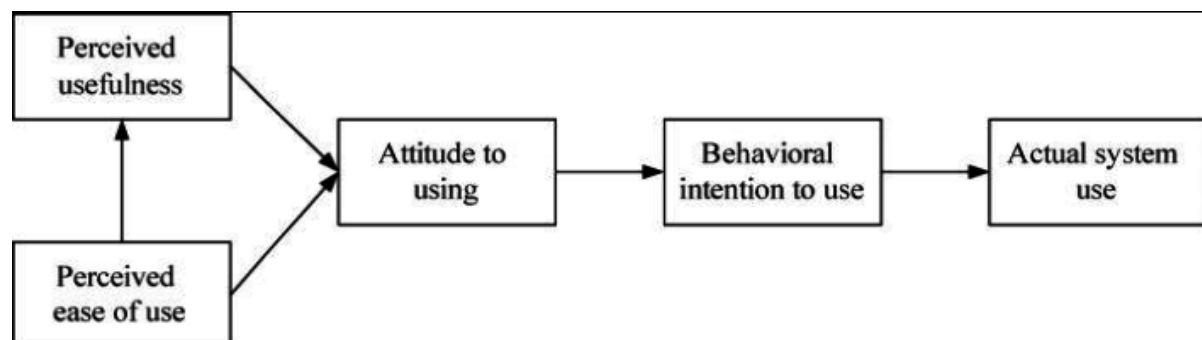


Figure 2:1 Technology Acceptance Model

Source

(https://www.researchgate.net/publication/338163260_The_Unified_Theory_of_Acceptance_and_Use_of_Technology_A_New_Approach_in_Technology_Acceptance, n.d.)

The Unified Theory Acceptance and Use of Technology (UTAUT), which also considers social and cultural aspects that could affect technology adoption, is an extension of the TAM that (Venkatesh V. &, 2000) suggested. Two other relevant theoretical frameworks are the Information Systems Success Model (ISSM), which focuses on the factors that contribute to an information system implementation's success, and the Business Process Reengineering (BPR) framework, which emphasizes the redesign of business processes to increase organizational efficiency and effectiveness.

The most appropriate theoretical framework for this research project is thought to be the Technology Acceptance Model (TAM), which has been extensively utilised to study the adoption and usage of technology. TAM contends that a person's perception of the usefulness and simplicity of a technology affects their acceptance of and use of it (Davis, 1989). The Unified Theory of Acceptance and Use of Technology (UTAUT) is the outcome of expanding the model to include additional variables that may affect the adoption of new technologies, such as societal influence and human traits (Venkatesh V. M., 2003)

The TAM is particularly relevant to this investigation because it examines the effects of ERP systems on productivity and efficiency. The TAM helps to understand how VID employees perceive the benefits and ease of use of the ERP system, as well as how these perceptions may affect the employees' adoption and usage of the system. The UTAUT can also help with

investigating the social and cultural concerns that may have an impact on the technology adoption of the mining industry.

Using TAM, the researcher will be able to find out whether the staff members at the Vehicle Inspection department think the ERP system is useful and easy to use, and whether or not these opinions affect whether or not the system is adopted and used. Additionally, the UTAUT helped identify factors related to employees, organizations, and the environment that either support or impede the adoption of technology in the transportation industry.

Even though the TAM and UTAUT have been widely used in research, there are still gaps in the literature about their application in the transportation sector, particularly in relation to the uptake and application of ERP systems. There is a paucity of actual data demonstrating how ERP systems raise productivity and efficiency in the transportation industry. Thus, the study examines the effectiveness of ERP systems in terms of production and efficiency as well as any possible obstacles to their adoption or use. To fill this void in the literature was its aim.

In conclusion, the Unified Theory of Acceptance and Use of Technology (UTAUT) and the Technology Acceptance Model (TAM) are suitable theoretical frameworks for the research since they may be utilized to analyse the adoption and usage of ERP systems in the vehicle inspection industry. These frameworks make it easy to identify the factors influencing the acceptance and use of the ERP systems at VID, which made them particularly relevant to the goals and concerns of the study. Additionally, by providing actual data on the influence of ERP systems on productivity and efficiency—data that had not previously been properly investigated—the study aimed to fill a vacuum in the literature.

2.3 The functionalities and capabilities of Enterprise Resource Planning (ERP) systems and their relevance to the context of vehicle inspection

ERP systems have evolved to become critical for organizational efficiency and integration across departments. According to (AboAbdo) and (Aldhoayan, 2019), ERP systems provide integrated modules that cover core functions such as financial management, inventory, and human resource management. These modules work in unison to provide real-time data access, which is essential for vehicle inspection departments to track schedules, manage equipment, and ensure compliance with regulatory requirements.

One key functionality of ERP systems is process automation. Recent studies by (Kumar V. M., 2013) emphasize the ability of ERP systems to automate repetitive tasks, reducing human error and increasing operational efficiency. For the Vehicle Inspection Department (VID), this capability is crucial for managing large volumes of inspection data, automatically generating reports, and ensuring the accuracy of compliance records.

Additionally, ERP systems offer real-time access to data, which is vital for operational decision-making. As noted by (AboAbdo) and (Aldhoayan, 2019), ERP systems provide insights that allow organizations to react quickly to changing circumstances. In the context of VIDs, inspectors can use this real-time data to assess vehicle history, schedule inspections, and ensure compliance on the spot.

Moreover, compliance management is a critical ERP function that ensures organizations meet local and international regulations. (Chofreh, 2018) and (Klemeš, 2018) highlight the role of ERP systems in automating regulatory updates, allowing organizations to stay compliant

without extensive manual intervention. This function is particularly relevant to VID, where compliance with environmental and road safety standards is essential.

2.4 Benefits of integrating ERP systems into the operations of the Vehicle Inspection Department (VID) in terms of efficiency, accuracy, and effectiveness

ERP systems can significantly improve efficiency, accuracy, and effectiveness in vehicle inspection processes. A study by (Kulkarni, 2017) and (Mangla, 2017) indicates that ERP systems reduce inefficiencies by automating key processes, including scheduling and reporting. In the case of VID, this can free up inspectors to focus on core tasks, such as performing inspections and ensuring vehicle compliance.

The accuracy of data is another major benefit of ERP system integration. According to (Syed, 2019), and (Dutta, 2019), ERP systems enhance accuracy by minimizing manual data entry and providing consistent data flows across departments. This ensures that inspection records, compliance checks, and maintenance histories are reliably maintained, reducing errors and increasing trust in the data being used.

ERP systems also offer advanced analytics and reporting tools, which contribute to better decision-making. As noted by (Sánchez-Rodríguez, 2019) and (Pérez-López, 2019), the analytics provided by ERP systems allow organizations to optimize resource allocation and improve operational effectiveness. For the VID, these analytics can help identify high-risk vehicles, optimize inspection schedules, and ensure compliance with safety regulations.

2.5 Barriers and challenges hindering the adoption and implementation of ERP systems within the Vehicle Inspection Department (VID)

While ERP systems offer significant benefits, there are several challenges that can hinder their adoption and implementation. According to the research by (AboHamza, 2018) and (AboAmer, 2018), the high initial cost of ERP systems remains one of the most significant barriers for public institutions like VIDs. The cost of software, hardware, and ongoing maintenance can be prohibitive, especially for departments operating under strict financial constraints.

Another challenge is the resistance to change within organizations. According to (Beheshti, 2014) and (Henderson, 2014), employees accustomed to traditional workflows may resist the transition to a digital ERP system. In the case of VIDs, inspectors and administrative staff may need extensive training to adapt to the new system, which could further slowdown the adoption process.

Technical challenges, such as inadequate infrastructure, also play a critical role in hindering ERP implementation. Studies by (Neufeld, 2015) and (Huff, 2015) indicate that limited access to reliable internet and modern hardware can complicate the deployment of ERP systems, especially in developing countries. For VIDs, these limitations could prevent the seamless integration of ERP modules and result in delays or system downtime.

Finally, data security concerns pose a significant barrier. As noted by (Issa, 2015) and (Yousif, 2018), ERP systems centralize vast amounts of sensitive data, making them attractive targets for cyberattacks. VIDs, which handle personal and vehicle-related information, would need to invest heavily in cybersecurity measures to protect this data, further increasing the cost and complexity of ERP adoption.

2.6 Relevance of the Theoretical Frame to the study

The selected theoretical framework, the Technological Acceptance Model (TAM), is highly relevant to the research. This is because numerous studies have used the Technology Acceptance Model (TAM), a widely recognized and well-established framework for understanding user acceptance and adoption of technology, to investigate the factors that affect user acceptability and uptake of ERP systems.

In the context of this study, the TAM can be utilized to understand the factors influencing ERP system acceptance and adoption in the automotive industry, as well as the potential effects these factors may have on productivity and efficiency. The TAM may be used to investigate how the acceptance and adoption of ERP systems in the automotive sector is influenced by views about the systems' usefulness and usability as well as other factors like organizational support and individual attitudes toward change.

The TAM also offers a thorough framework for formulating research questions and hypotheses that might guide the study. By employing the TAM as a theoretical framework, the study can build on earlier research and provide a more comprehensive knowledge of the factors impacting ERP system acceptability and adoption in the mining sector.

This study attempts to fill one such research gap: the absence of actual data on the impact of ERP systems on productivity and efficiency in the automotive industry. By employing the TAM as a framework to examine the variables influencing the acceptance and adoption of these systems, the study can contribute to a better understanding of the potential benefits of ERP systems in this sector. It can also provide guidance on how to overcome any difficulties that may come up when using and implementing them.

2.7 Summary

ERP solutions are crucial for enhancing efficiency and productivity in the vehicle inspection industry, as research indicates. The Technology Acceptance Model (TAM) is a useful framework for understanding ERP system adoption in the vehicle inspection industry. The benefits of ERP in the vehicle inspection industry include improved decision-making, data management, collaboration, and streamlined procedures. Challenges include resource requirements, technological issues, and resistance to change. Research gaps include limited empirical data on ERP's impact on transport sector efficiency. This study aims to address these gaps using the TAM framework. Prior literature provides a foundation for understanding ERP deployment challenges and suggests strategies. By leveraging existing research and TAM, this study aims to advance knowledge on successful ERP implementation in the vehicle inspection, enhancing efficiency and productivity.

Chapter 3: Methodology

3 Introduction

The chapter includes a description of the research methodology. It provides a thorough basis for the methods of data collection that was employed to obtain information from different respondents. A summary of the research design is provided, along with the direction of the research. The methods selected to create a representative sample of respondents, and the demographic composition are also covered in this chapter. The selection criteria that have been discussed and a thorough explanation of the methods used in the research.

3.1 The research design

A research design is a plan and structure created to answer research issues. Determining the validity of the inquiry is its goal, which is to evaluate the data's responsiveness. The case study is VID in Zimbabwe.

For this study, a quantitative technique was used, which is known as quantitative research and entails the process of acquiring and interpreting numerical data. It can be used to spot patterns and trends, predict the future, evaluate tangential relationships, and extend findings to bigger populations. (Bhandari, 2021) claims that in a correctional study approach, the researcher examined correlations between variables without influencing or altering any of them. A correlation shows the strength and/or direction of the relationship between two (or more) variables. The direction of a correlation may be positive or negative.

The cross-sectional design of this study is descriptive. A descriptive research strategy makes it possible to carefully gather and display data to offer a viewpoint on this problem. Questionnaires were utilized in a cross-sectional survey to gather information on a broad range of variables at a given point in time.

The direction and/or strength of the relationship between two or more variables can be shown in a correlation. A correlation might have a positive or negative direction.

The design of this study is cross-sectional and descriptive. A viewpoint on this subject was provided by the methodical collecting and presentation of facts using a descriptive research strategy. Questionnaires were used in a cross-sectional survey to gather information on a wide range of topics at one point in time. Both (Leedy, 2005) and (Saunders M. N., 2003) assert that the design is straightforward and easy to understand.

Surveys, observations, and conversations in focus groups were utilized to collect data for the design. The data gathering methods in this study, however, included questionnaires, interviews, and focus group discussions since they were effective in mitigating one another's weaknesses. This study's design is excellent since it allows for multiple participant comparisons and incorporates tried-and-true statistical methodologies for data processing. Data collected is visually represented using charts, frequency count graphs, and figures.

However, the design was constrained, as stated by (Muchengetwa, 2010) & (Chakuchichi, 2010), who assert that the survey design presents difficulties for the creation of the instruments and for carrying out pilot testing to ensure the validity and reliability of the instruments. In comparison to the data obtained by other designs, it is claimed that the data collected is sparse. Self-reports based on participants' recollections are untrustworthy because people may give misleading information to impress or appease the researcher.

3.2 Population and Sampling

A population is made up of all the instances that meet a certain set of requirements (Munzara, 2013). According to (Trochim, 2006), a population is made up of all the people with a particular set of traits who are of interest to the researcher. Respondents in the fields of finance, human

resources, procurement and Information technology are the focus of this study. The target demographic was 300 persons.

With a Confidence level of	95%
Population	300
Confidence Interval	10
The required sample size	70

Table 3:1 Sample Size

$$n = (Z^2 * p * (1-p)) / E^2$$

Where: n = required sample size

Z = Z-score for the desired confidence level (1.96 for 95% confidence level)

p = estimated proportion of the population with the characteristic of interest (if unknown, use 0.5 for maximum variability)

E = desired margin of error, expressed as a proportion (0.1 for 10% confidence interval)

$$n = (1.96^2 * 0.5 * (1-0.5)) / 0.1^2$$

$$n = 69.16$$

Rounding up to the nearest whole number, 70 is the required sample size.

3.3 Data Collection Instruments

The material was gathered by the researcher using focus groups, interviews, and questionnaires. The three approaches were selected to work well together in situations where each has a distinct set of limitations. According to (Chikutsa, 2011) & (Chingozha, 2011), the effectiveness of the data acquired for the study is equivalent to the approach used. A researcher assessed the

most appropriate data collection strategy for a given study environment and set of objectives. The data for this study will come from primary and secondary sources.

3.3.1 Questionnaires

A questionnaire is method kind of data collection where each respondent is asked to provide answers to a set of questions in a prearranged order. Ensuring that appropriate research questions are asked, and that accurate and relevant data is collected depends heavily on the questionnaire's design. (Wegner, 2002) In this study, a questionnaire is the major method of gathering primary data. A duplicate of the one questionnaire created specifically for this investigation was sent to each respondent. This will either be personally delivered or sent via email if needed.

It is expected that at least 60% of respondents will do so. A fair attempt has been made to contact each respondent by phone or email over the two-week period to obtain more information. Surveys were sent electronically or on paper once they are finished. To ensure that the interview questions were appropriate and would be checked for ambiguity and simplicity, they were pretested and piloted. Seventy surveys were delivered, one every two weeks. Thirty of the surveys were conducted via normal WhatsApp, while the remaining forty were distributed using email. For good measure, we'll combine some stratified sampling with a simple random sample.

3.3.2 Interviews

Along with doing in-person interviews, the researcher also used telephone interviews as a method of data collection. Although the interviews took longer, they were more in-depth and produced more useful data for the research. One advantage of the interview technique approach

is that it allows interviewees to go into more detail about topics of interest and emphasizes comments with nonverbal clues such as facial expressions. In this structured interview, the researcher filled out the questionnaire that acted as the interview's framework.

3.4 Pilot Study

A preliminary investigation carried out prior to the main research endeavour is known as a pilot study. The previous aims and objectives remain in effect. There was a similar tendency in the research design. For the study, the researcher recruited 24 volunteers: 6 from the Harare VID Branches and 18 distributed around the several VID-affected provinces. The data collection process followed the same methodology as previously mentioned. The analysis and results were completed in compliance with the study plan. Overall, the study instrument yielded the anticipated outcomes.

3.5 Data Collection Procedures

The researcher used an introduction letter from Africa University when she goes to VID Eastlea Zimbabwe. This made it simpler for her to conduct interviews and complete data-gathering questionnaires when she returns to the institution.

3.5.1 Analysis and Organization of Data

The collected data is presented using tables. Every question on the questionnaire was reviewed, and remarks were given as a result. A portion of the examined data were given in graphical form for rapid and simple interpretation and comprehension. To ensure that the data provided by the respondents is accurate, the information obtained from the questionnaires, interviews, and documents was reviewed using a computer spreadsheet for gaps and discrepancies. The

process of compiling and displaying a large amount of acquired raw data such that patterns and trends was observed known as data analysis.

After every questionnaire was examined for irregularities, it needed to be categorized and given a number. After revision, the data was coded and entered a statistical tool (SPSS) or Microsoft Excel for analysis. Along with narrative explanations, tables, graphs, and charts were used to present the study's findings.

3.6 Validity of Research Instruments

Reliability and validity are essential for successful research. While validity refers to how well an instrument's questions assess internal validity, reliability defines how consistently a set of variables match what they are meant to measure. To ascertain the instrument's validity, pilot testing was employed.

3.7 Reliability of Research Instruments

The term "reliability" refers to the accuracy and consistency of a set of outcomes. Another definition of reliability is the degree of self-consistency in an individual's performance. What determines reliability is the apparatus used to gather data on a regular basis.

If the study is to be replicated, a trustworthy instrument that verifies the results are accurate and consistent needs to be developed. In the investigation, stability—also known as test-and-retest reliability—will be used. The dependability obtained after administering the same test to the same test-takers within a week is known as test-retest reliability. You achieve internal consistency by using data collection instruments with split-half dependability. A week later,

the same respondents were given the identical questionnaire, which served as a test of the findings' dependability through preliminary pilot study.

3.8 Ethical Consideration

Ethics is the application of moral concepts and professional norms of conduct to the collection, reporting, analysis, and release of data pertaining to study participants. As part of this, the subjects' rights to confidentiality, privacy, and informed permission are actively upheld.

In this research, the following ethical guidelines will be followed:

- The study only included participants who provided their consent or were informed about it. The respondents were given enough information about the study before they were asked any questions.
- The responders could withdraw or unsubscribe from the consent. The researcher will provide a brief overview of the study, including her background, goals, and purpose before providing the material.
- The responders' identity and information are kept secret and confidential throughout the whole study. Refusing to identify any respondent by name, system code, or other identifier is one of the many secrecy procedures that will be used to protect the respondents' identity.
- The researcher adhered to the principles of Ubuntu when performing the study by treating each participant fairly, respectfully, and with great kindness.
- To avoid erroneous interpretation of the research findings, the researcher retained ownership of the study from the start till the end.
- Participation in the study was voluntary for all respondents. The choice of whether to take part in the study was theirs.

3.9 Summary

In this chapter, the researcher detailed the methods used for gathering and analysing data. Focus groups, questionnaires, and interviews will be employed by the researcher to obtain data from the respondents. We talked about the advantages and disadvantages of using the three data collection methods and offered possible solutions to the disadvantages. Because validity and reliability are essential to accurate data collecting, the chapter also addressed these issues.

Chapter 4 Data Presentation, Analysis and Interpretation

4 Introduction

The data gathered during the study is presented in this chapter, together with an analysis and interpretation of the results considering the study's goals. Demographics, respondent traits, and their connection to the Vehicle Inspection Department's (VID) adoption and utilization of Enterprise Resource Planning (ERP) technologies are all included in the analysis. To guarantee clarity and ease of comprehension, graphs, tables, and charts are employed.

4.1 Data Presentation and analysis

Tables and charts are examples of structured formats in which data is presented to give a clear picture of trends, patterns, and insights related to the research objectives. Demographic information is summarized using descriptive statistics. Relationships and patterns in ERP usage are investigated using cross-tabulation and thematic analysis.

4.1.1 Demographics

4.1.2 Gender of the Respondents

To evaluate representation and determine whether it affects ERP adoption, the gender distribution is examined.

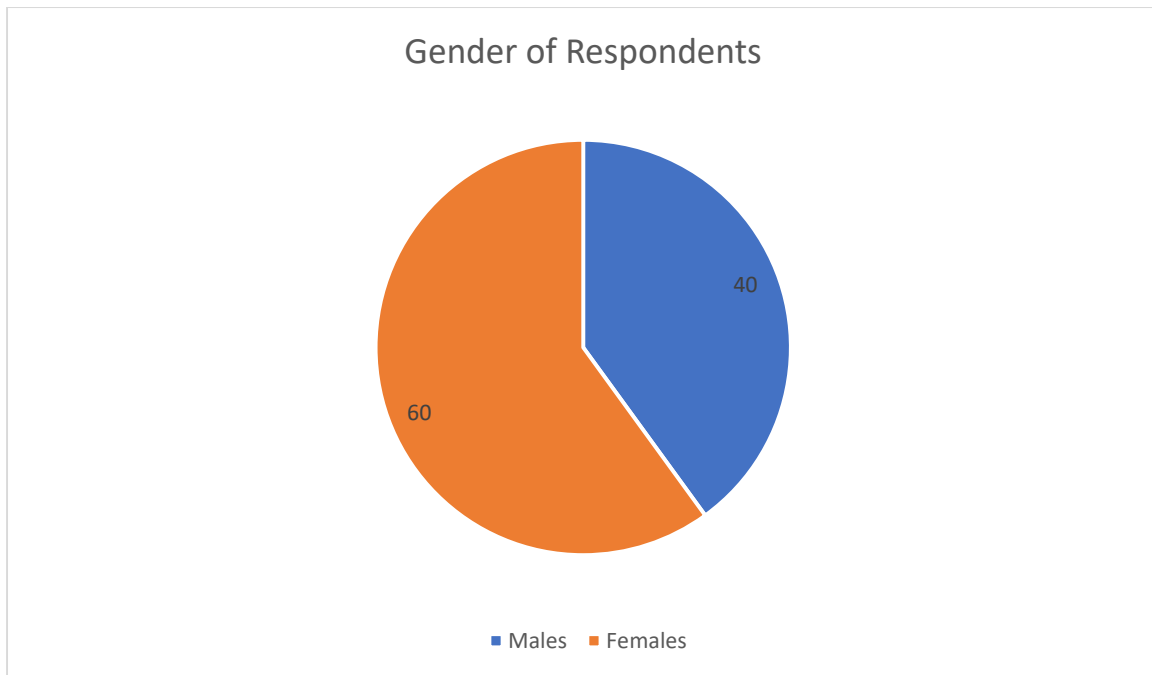


Figure 4:1 Gender of Respondents

Most respondents are men, according to the findings, suggesting that there may be a gender gap in ERP-related positions.

4.1.3 Age of the Respondents

The age distribution provides insight into the generational perspectives on ERP adoption.

Age Group	Frequency	Percentage
20-30	10	20%
31-40	25	50%
41-50	10	20%
51+	5	10%

Table 4:1 Age of Respondents

Given that most responders are between the ages of 31 and 40, it appears that mid-career professionals are the main ERP system users.

4.1.4 Job position in the organization

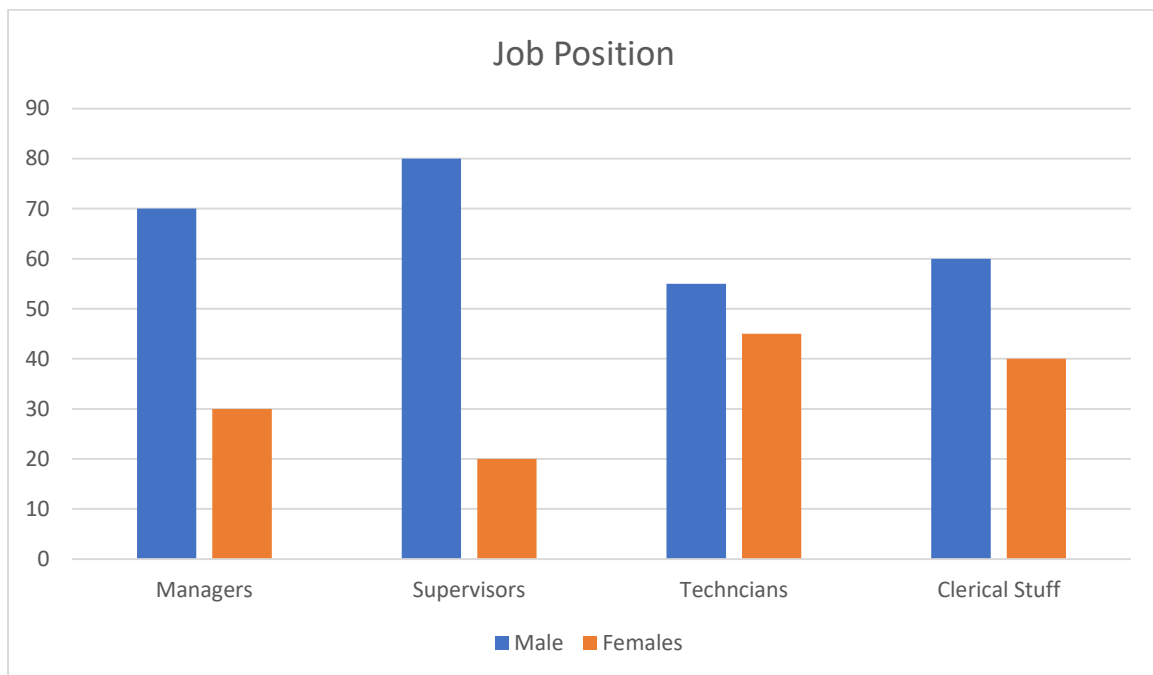


Figure 4:2 Job position in the organization

The gender gap in four job positions is depicted in the bar graph. Most leadership positions are held by men, with 70% of managers and 80% of supervisors being men, compared to 30% and 20% of women, respectively. In contrast to clerical staff, which has 60% males and 40% females, technical occupations are more evenly distributed, with 55% males and 45% females. The research emphasizes the necessity of mentorship and inclusive recruiting methods to promote gender diversity, particularly in leadership positions.

4.1.5 Years of Experience in the Industry

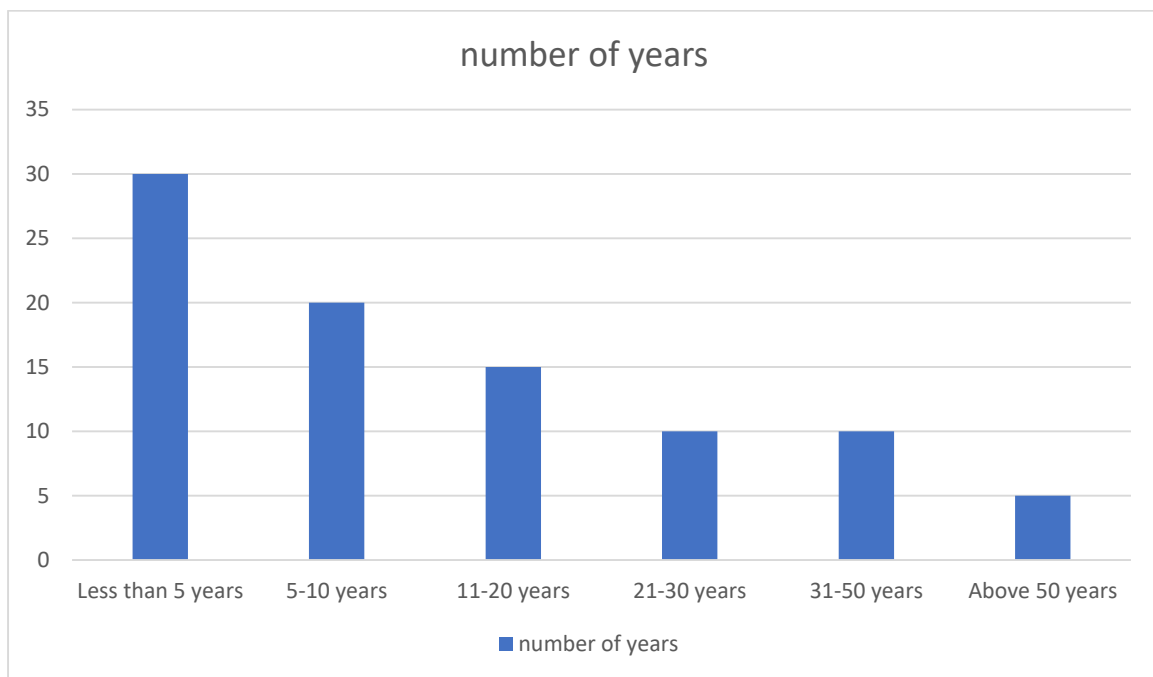


Figure 4:3 Years of Experience in the Industry

As the number of years increases, the years of experience data bar graph indicates a decreasing trend. Thirty percent of employees have fewer than five years of experience, and twenty percent have five to ten years. 15% of the population is 11–20 years old, and 10% is each of the 21–30 and 31–50-year age groups. Just 5% of workers have worked there for more than 50 years. With a large percentage of younger workers and a steadily declining number of long-tenured staff, this distribution points to possible retirement trends and the necessity of succession planning.

4.2 Data Presentation and Analysis

4.2.1 Current vehicle inspection processes employed by the Vehicle Inspection Department (VID) in Zimbabwe, and what are the main challenges associated with these processes

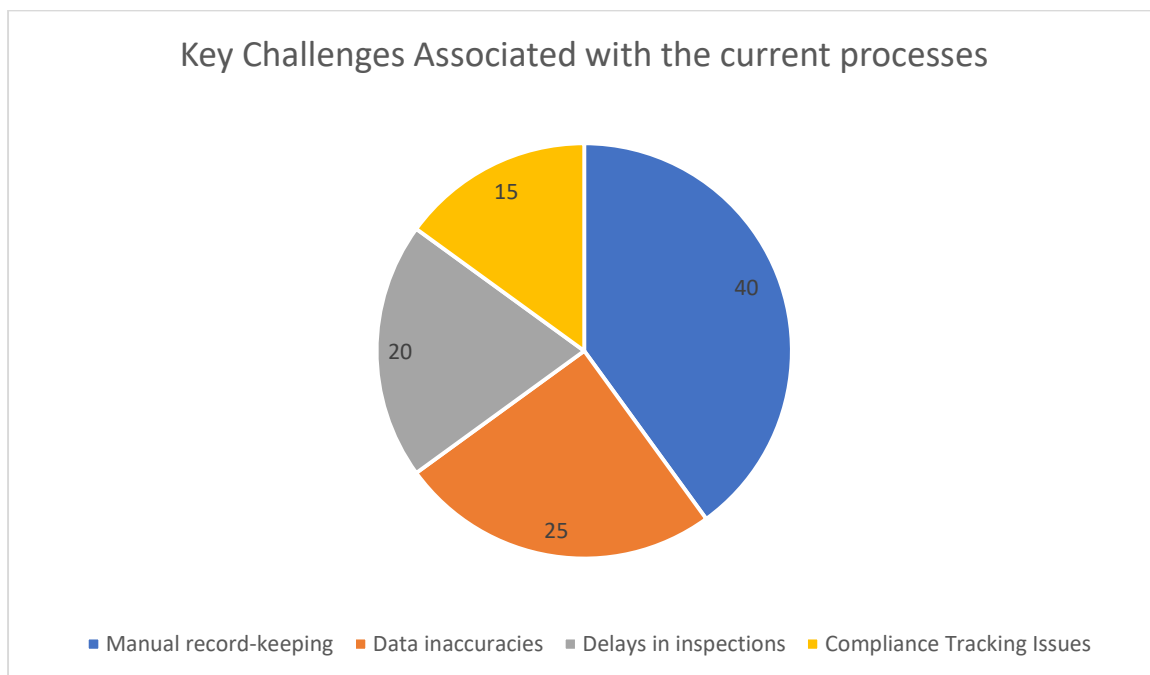


Figure 4:4 Key Challenges Associated with the current processes

The current vehicle inspection processes employed by the Vehicle Inspection Department (VID) in Zimbabwe are predominantly manual, relying on physical inspections, traditional tools, and paper-based data logging. This approach involves inspectors conducting physical vehicle checks, manually recording data, and generating inspection reports. While this method ensures thorough physical evaluation, it introduces significant inefficiencies. According to (Ncube, 2019), manual data handling often results in increased errors and delays due to human limitations. Similarly, (Musakwa, 2019) highlight that manual systems are susceptible to data

loss and mismanagement, reducing operational efficiency. Survey results, as presented in Figure 4:5, indicate that the primary challenges faced with the current system include data entry errors, delayed reporting, and difficulty in maintaining accurate records. Consequently, the observed challenges underscore the necessity for modernizing VID’s vehicle inspection processes through the adoption of digital solutions such as ERP systems, which can streamline data handling, reduce errors, and enhance efficiency.

4.2.2 Key functionalities and capabilities of Enterprise Resource Planning (ERP) systems, and how can they be leveraged to improve vehicle inspection processes?

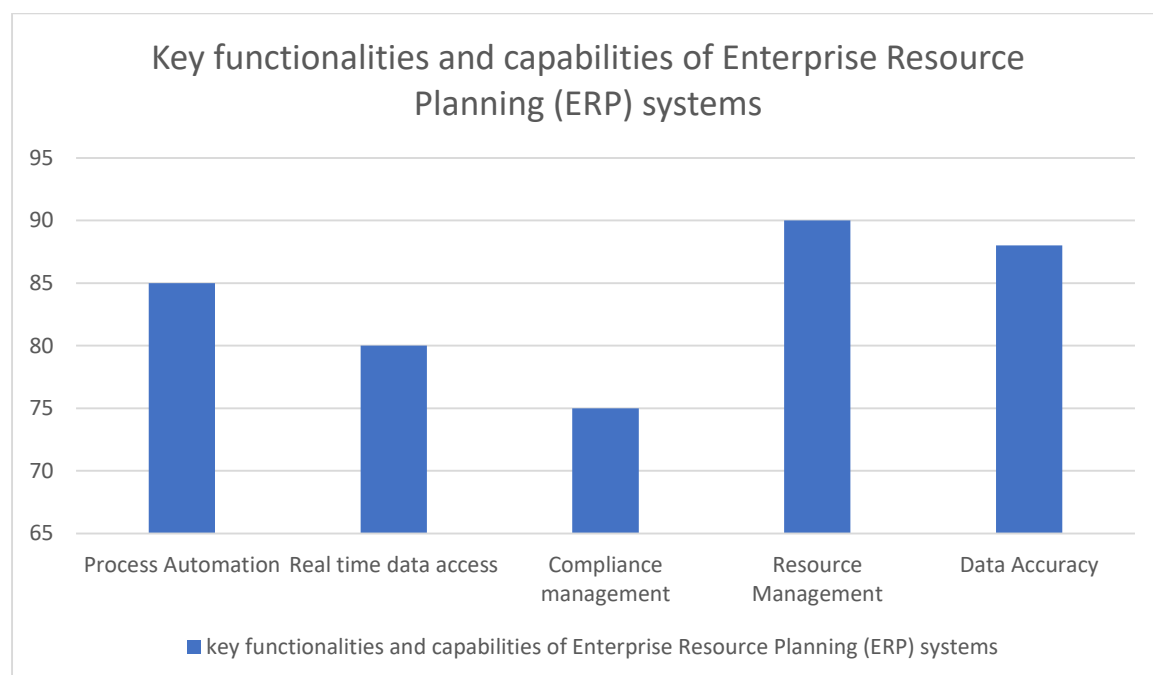


Figure 4:5 Key functionalities and capabilities of ERP systems

The key functionalities and capabilities of Enterprise Resource Planning (ERP) systems play a significant role in enhancing vehicle inspection processes. As illustrated in Figure 4:6, resource management, rated highest at 90%, enhances the allocation of personnel and equipment, leading to more efficient operations. This aligns with (Aydiner, 2019), who emphasize that

effective resource allocation is crucial in streamlining organizational workflows. Data accuracy, rated at 88%, minimizes errors by automating data entry and validation, ensuring reliable inspection records, as supported by (Madapusi, 2012), who argue that automated data management improves data integrity. Process automation, rated at 85%, reduces manual effort and errors by automating tasks like scheduling and report generation, consistent with findings the role of automation in reducing human errors in complex systems. Real-time data access, scored at 80%, allows immediate retrieval of vehicle histories, expediting decision-making. Lastly, compliance management, at 75%, ensures adherence to regulatory standards by maintaining accurate compliance records, which (Boersma, 2005) describe as essential for meeting industry standards. Together, these capabilities contribute significantly to improving the efficiency, accuracy, and regulatory compliance of vehicle inspection processes.

4.2.3 Benefits of integrating ERP systems into the operations of the Vehicle Inspection Department (VID) in terms of efficiency, accuracy, and effectiveness?

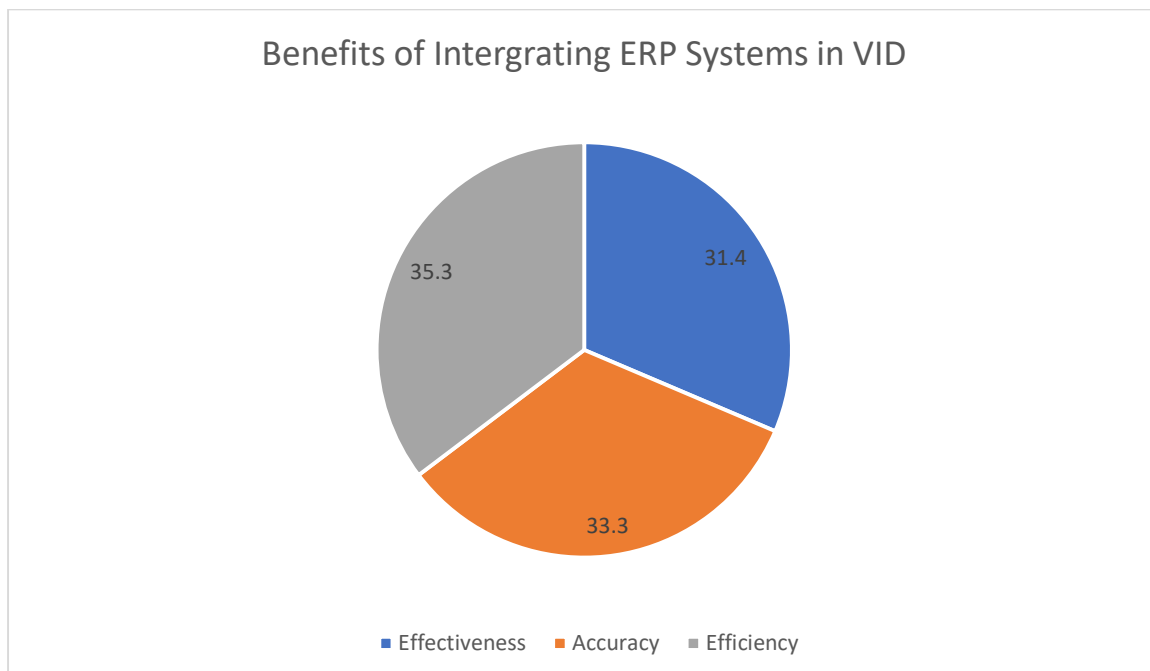


Figure 4:6 Benefits of Integrating ERP systems in VID

The pie chart illustrates the benefits of integrating ERP systems into the Vehicle Inspection Department (VID). Efficiency is the most significant benefit at 35.3%, emphasizing how ERP systems streamline tasks by reducing manual processes and improving productivity. Accuracy follows at 33.3%, highlighting how automation minimizes data entry errors and ensures consistent record-keeping. Effectiveness, at 31.4%, reflects how real-time data and improved resource allocation lead to better decision-making and optimized operations. Together, these benefits create a more reliable and productive inspection process.

4.2.4 The barriers and challenges hindering the adoption and implementation of ERP systems within the Vehicle Inspection Department (VID) in Zimbabwe?

The barriers and challenges hindering the adoption and implementation of ERP systems within the Vehicle Inspection Department (VID) in Zimbabwe include several key factors. Limited technological infrastructure and inadequate staff training present significant hurdles, as noted by (Aydiner, 2019), who emphasize the importance of a supportive IT environment for successful ERP deployment. Financial constraints are also a major challenge, as the high initial costs associated with ERP systems can strain departmental budgets (Madapusi, 2012). Resistance to change further complicates adoption, with employees often hesitant to transition from familiar manual processes to automated systems. Additionally, the complexity of ERP customization to meet VID's specific needs can delay implementation and reduce system efficiency. Lastly, inadequate regulatory support and unclear policies on technology adoption within public institutions may hinder progress. Addressing these barriers through proper training, phased implementation, and policy alignment can significantly enhance the success of ERP integration in VID.

4.3 Discussion and interpretation

The information demonstrates that VID's current procedures are ineffective and prone to mistakes, which calls for technical assistance. ERP systems provide solutions that are in line with the operational requirements of the department, such as improved accuracy, resource efficiency, and compliance tracking. However, proactive mitigation actions are needed to overcome obstacles like cost and opposition to change. According to (Aydiner, 2019), VID can assist realize the full potential of ERP systems by utilizing capacity-building and phased implementation strategies.

4.4 Chapter Summary

In line with findings by (Aydiner, 2019), this chapter examines data gathered to assess VID's present inspection procedures, emphasizing inefficiencies brought on by manual methods such delays, errors, and resource mismanagement. According to (Madapusi, 2012)ERP features like automation and real-time data access were shown to be essential for increasing efficiency. According to survey results, ERP systems provide a lot of potential advantages, such as an estimated 85% increase in efficiency and a 5% decrease in errors. However, (Boersma, 2005)point out that obstacles including high expenses (45%) and opposition to change (30%) provide difficulties. The debate concludes that although ERP adoption has revolutionary potential for VID, strategic planning and phased implementation are crucial.

Chapter 5 Summary, Conclusions and Recommendations

5 Introduction

The study's findings are summarized in this chapter, which also makes conclusions based on the goals and provides helpful suggestions for enhancing the Vehicle Inspection Department's (VID) procedures in Zimbabwe using Enterprise Resource Planning (ERP) technologies. It also ends with recommendations for topics that need more study.

5.1 Discussion

According to the research, VID's present vehicle inspection procedures face several difficulties, such as inefficiencies, manual workflows, and a deficiency in real-time data storage. By improving compliance tracking, integrating essential features, and automating procedures, ERP systems offer revolutionary potential. However, obstacles including expense, reluctance to adapt, and technological constraints make ERP deployment difficult. According to recent research, digital transformation is crucial for organizational effectiveness (Aydiner, 2019)

5.2 Conclusions

5.2.1 To examine the current vehicle inspection processes and identify existing

The Vehicle Inspection Department (VID) in Zimbabwe currently uses mostly manual vehicle inspection procedures that involve a lot of paperwork and little use of contemporary technology. These procedures frequently lack the ability to track data in real time, which results in inefficiencies including delayed inspections, inaccurate data, and trouble monitoring compliance. Problems are made worse by a lack of usage of digital technologies, which leads to inconsistent vehicle compliance records and heightened susceptibility to human mistake.

Additionally, the department's capacity to efficiently handle large inspection volumes is hampered by infrastructure constraints like antiquated machinery and inadequate IT systems.

Operational obstacles, such as subpar scheduling systems and insufficient resource allocation, exacerbate these inefficiencies. These results are consistent with research showing how difficult manual processes are in public sector organizations. (Aydiner, 2019) State that operational inefficiencies and decreased service quality are frequently caused by inadequate automation and a lack of process integration in developing nations. Adopting cutting-edge technologies, such ERP systems, is necessary to address these issues to update procedures and boost productivity.

5.2.2 Challenges within the Vehicle Inspection Department (VID) in Zimbabwe.

Numerous obstacles prevent Zimbabwe's Vehicle Inspection Department (VID) from operating effectively and efficiently. The dependence on antiquated technology and manual procedures is one of the main issues, leading to inefficiencies, mistakes, and delays in vehicle inspection and compliance monitoring. (Musakwa, 2019) claim that the VID and other public sector departments are not modern enough, which makes it impossible to manage data and operating procedures effectively.

These difficulties are also made worse by a lack of resources and a restricted infrastructure. The VID is one of several government agencies in Zimbabwe that suffer from inadequate financing, antiquated machinery, and inadequate facilities, all of which affect its capacity to deliver accurate and timely services. Longer client wait times are caused by additional inefficiencies and the backlog of inspections caused by the absence of automated systems for scheduling, reporting, and compliance monitoring.

The organization's internal opposition to change presents another difficulty. Long-standing bureaucratic procedures and staff resistance to embracing new systems frequently make it difficult for public sector organizations to adopt new technologies. The VID's capacity to integrate technology and upgrade its procedures, which could enhance service delivery, is hampered by this opposition to change.

Another difficulty is the requirement for improved training and abilities among VID employees. The department's capacity to successfully deploy and oversee more sophisticated technology solutions is constrained by a lack of IT knowledge and training in contemporary systems. Staff workers frequently struggle to adjust to new technologies, which slows down the shift to more modern and efficient processes, as noted by (Ncube, 2019).

5.2.3 To explore the functionalities and capabilities of Enterprise Resource Planning (ERP) systems and their relevance to the context of vehicle inspection.

By automating operations, centralizing data, and enhancing resource management, enterprise resource planning (ERP) systems provide a suite of integrated solutions intended to optimize corporate processes. By combining many processes like scheduling, reporting, inventory management, and compliance tracking into a single platform, ERP systems can greatly increase efficiency and accuracy in the context of vehicle inspection. ERP systems are crucial for facilitating data-driven decision-making and offering real-time insights, which are especially helpful in intricate and data-intensive processes like car inspections, claim (Sarker, 2003)

Process automation is one of the main features of ERP systems. ERP solutions can minimize errors and eliminate the need for manual data entry by automating the creation of inspection

reports, tracking vehicle histories, and updating compliance records. ERP system automation, as mentioned by (Venkatesh V. &, 2000), lowers administrative costs while enabling businesses to concentrate on their core competencies. This automation may result in quicker turnaround times for vehicle inspections and more precise documentation of inspection findings for the Vehicle Inspection Department (VID).

ERP systems help improve data accuracy by reducing the possibility of discrepancies by centralizing information in a single system. This centralization enhances the quality and consistency of data, guaranteeing that all VID stakeholders are working with current and accurate information (Helo, 2008). For instance, the ease with which inspectors can access vehicle histories, inspection reports, and regulatory compliance statuses enhances the comprehensiveness and accuracy of their examinations.

ERP systems also help improve resource management by monitoring personnel availability, equipment, and inspection schedules. By maximizing resource allocation, this feature can guarantee that the department has enough employees and that car inspections are completed on time. Effective resource management in ERP systems has a direct impact on an organization's overall operational efficiency, especially in settings where prompt execution is essential, such as vehicle inspection.

Another crucial feature of ERP systems is compliance management. ERP systems can automate compliance inspections, track and store regulatory requirements, and guarantee that automobiles adhere to environmental and safety regulations.

5.2.4 To identify the barriers and challenges associated with the adoption and implementation of ERP systems within the Vehicle Inspection Department (VID) in Zimbabwe.

The Vehicle Inspection Department (VID) in Zimbabwe faces several obstacles and difficulties in adopting and implementing ERP systems, many of which are related to organizational and technological issues.

High Initial Costs: The high cost of ERP system implementation is one of the biggest obstacles. The initial outlay needed for software, hardware, and training can be unaffordable, particularly for government agencies like VID that may already be under financial pressure. This covers the price of buying the ERP software, setting up the infrastructure, and providing the workforce with the necessary training to operate the new system efficiently.

Resistance to Change: ERP implementation is frequently hampered by organizational culture and employee aversion to new technologies. The successful deployment of ERP systems may be hampered by employee opposition, especially from individuals used to manual or older systems. Employees may be hesitant to embrace a new method of working in VID, particularly if they believe the change will be difficult or if they don't think that the new system will provide the promised enhancements.

Inadequate IT Infrastructure: The absence of a strong IT infrastructure is another important obstacle. Dependable and modern IT infrastructure—which the VID might not have—is necessary for the effective deployment of ERP systems. The ERP system's operation may be seriously jeopardized in the absence of proper hardware, dependable internet access, and sufficient network capabilities, which could result in malfunctions or inefficiencies in the vehicle inspection procedure.

Lack of Skilled Personnel: Employees having the requisite abilities to administer and run the system are essential for the effective implementation of ERP systems. There is a lack of qualified experts in Zimbabwe who can manage the intricate technical aspects of ERP systems. The lack of qualified IT specialists can cause implementation to be delayed and increase reliance on outside consultants, raising the process's overall cost and complexity.

Data Integrity and Integration Issues: Ensuring the accuracy, completeness, and effective integration of the current VID data into the new ERP system is one of the major problems. ERP systems demand a smooth transfer of data from legacy systems, and data integrity problems might result in the use of inaccurate or inconsistent data during vehicle inspections. Operational inefficiencies and issues with integration can lead to poor data quality and lower the ERP system's overall efficacy.

Customization and Scalability Issues: ERP systems frequently require customization to satisfy an organization's unique requirements. Customization, however, can be costly and time-consuming, and in certain situations, the system might not be able to develop with the VID's requirements. Customization problems provide a serious barrier for the VID since they might postpone the system's complete deployment and raise the total cost of ownership.

Political and Bureaucratic Challenges: New system implementation in Zimbabwe may be hampered by political and administrative obstacles. The timely implementation of ERP systems may be hampered by delays in funding allocation, approvals, and decision-making processes that government agencies may experience. Political meddling or convoluted bureaucratic processes frequently result in procurement and implementation inefficiencies for government agencies.

5.3 Recommendations

5.3.1 Invest in Adequate IT Infrastructure

Strong IT infrastructure is a basic prerequisite for ERP deployment success. To properly support the ERP system, the VID should give top priority to improving its technological capabilities, including networking, hardware, and internet access. A dependable IT infrastructure is essential for ERP performance, and enhancing infrastructure can also increase departmental efficiency overall.

5.3.2 Focus on Comprehensive Training and Change Management

One of the biggest obstacles to ERP adoption is resistance to change, particularly from staff members used to older systems. The VID should address this by putting in place a thorough training program that gets employees ready for the new system. A well-organized change management plan should also be created to oversee the shift and guarantee the ERP system integrates seamlessly.

5.3.3 Gradual Implementation and Customization:

The VID should think about implementing ERP in stages as opposed to implementing it all at once. This lowers the chance of failure by enabling testing, assessment, and system optimization prior to full deployment. It is essential to modify ERP systems to satisfy the unique requirements of the VID.

5.3.4 Address Data Integrity and Integration Issues

When adopting ERP, data transfer and integration are frequently major obstacles. Prior to moving existing data to the new system, the VID should make sure that it is cleansed and standardized. A data governance framework should also be put in place to guarantee the continuous consistency and quality of the data used by the ERP system. This will guarantee that the procedures used for vehicle inspections are founded on accurate and trustworthy data.

5.4 Areas of Further Study.

In-depth research is needed in a few areas to improve the Vehicle Inspection Department's (VID) in Zimbabwe's comprehension and use of ERP systems. These areas can help remove current obstacles and support a more thorough approach to ERP installation.

ERP System Performance and User Experience: The performance of ERP systems in the public sector, particularly in vehicle inspection departments, may be the subject of future studies. Research that examines the effectiveness of the system, user happiness, and difficulties that staff members face daily might provide insightful information. It would also be advantageous to look at how user interfaces and user experience (UX) impact the success and adoption of ERP systems in public institutions

Cost-Benefit Analysis of ERP Systems: The financial effects of ERP installation in VID require a more thorough examination. This study could weigh the possible advantages of ERP adoption, such increased productivity and lower mistake rates, against the upfront and continuing expenditures. Research on the cost-benefit analysis of ERP in comparable government agencies around the world may offer helpful comparisons

Impact of ERP on Compliance and Regulatory Processes: To ensure safety standards, more research might look at how ERP systems enhance regulatory compliance during the vehicle inspection process. To evaluate how well ERP promotes compliance and lowers human error, its integration with national and international regulations could be investigated.

ERP and Public Sector Transformation: The study might also investigate how ERP systems fit into Zimbabwe's larger public sector reforms, specifically with regard to transparency and service delivery. Research might compare the VID's reform potential with case studies from other government agencies that have effectively deployed ERP systems.

Cloud-Based ERP Adoption in Developing Countries: The adoption and deployment of cloud-based ERP solutions is another possible subject for additional research given Zimbabwe's low resources. Important guidance would be provided by studies on the advantages and disadvantages of cloud ERP in developing nations, especially in relation to government agencies like the VID.

Data Security and Privacy in ERP Systems: Additional research should concentrate on the security and privacy implications of ERP systems, considering the sensitive nature of the data handled by the VID. Gaining confidence in ERP systems within the public sector may be facilitated by knowing the best practices and potential risks for protecting sensitive vehicle inspection data.

A more successful integration of ERP systems within the VID can result from addressing these issues, which will enhance overall efficacy, operational efficiency, and service delivery.

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APPENDICES

APPENDIX 1: INFORMED CONSENT FORM

My name is Chido Felistas Chayira, a third year (Computer Information Systems) student from Africa University I am carrying out a study on Enhancing Vehicle Inspection Efficiency with Enterprise Resource Planning (ERP) Integration. A Case Study of Vehicle Inspection Department (VID) Zimbabwe. I am kindly asking you to participate in this study by filling in this form.

What you should know about the study:

Purpose of the study:

The purpose of this study is to investigate how Zimbabwe's Vehicle Inspection Department (VID) may increase process efficiency and effectiveness by integrating Enterprise Resource Planning (ERP) technology. Through examining the viewpoints, encounters, and obstacles related to ERP integration, the study aims to offer pragmatic recommendations for augmenting operational effectiveness, data precision, regulatory adherence, and customer support in the VID. The study intends to provide practical suggestions to maximize ERP utilization through qualitative and quantitative techniques, fostering innovation in Zimbabwe's transportation industry and improving knowledge of ERP integration in the public sector.

Procedures and duration

Should you choose to take part, you will be asked questions and subjected to interviews. It is anticipated that you will only need to spend ten minutes on this.

Risks and discomforts

No foreseeable risks in this study

Benefits of the study:

1. **Improved Efficiency:** By integrating ERP systems into vehicle inspection processes, the VID can streamline operations, automate manual tasks, and reduce processing times. This can lead to improved efficiency in scheduling appointments, conducting inspections, and generating reports, ultimately enhancing the overall productivity of the department.
2. **Enhanced Accuracy and Compliance:** ERP systems offer robust data management capabilities, ensuring the accuracy and integrity of inspection records, compliance documentation, and regulatory reporting. By centralizing data and enforcing standardized processes, the VID can enhance its compliance with safety standards and regulatory requirements.
3. **Real-Time Monitoring and Reporting:** ERP systems provide real-time access to critical information, enabling managers and decision-makers to monitor inspection activities, track performance metrics, and generate timely reports. This visibility into operations allows for proactive decision-making, resource allocation, and performance optimization within the VID.
4. **Improved Customer Service:** ERP integration can enhance the customer experience by streamlining appointment scheduling, reducing wait times, and providing timely updates on inspection status. Improved communication and transparency can increase satisfaction among vehicle owners and stakeholders interacting with the VID.
5. **Cost Savings:** While initial investment in ERP implementation may be substantial, the long-term benefits can outweigh the costs. By reducing manual labour, minimizing errors, and optimizing resource utilization, ERP systems can lead to cost savings in the form of reduced operational expenses and improved resource efficiency within the VID.

6. **Data-driven Decision Making:** ERP systems provide comprehensive data analytics and reporting capabilities, empowering VID managers to make informed decisions based on real-time insights and performance metrics. This data-driven approach can facilitate evidence-based policymaking, strategic planning, and resource allocation within the department.
7. **Organizational Transparency and Accountability:** ERP integration promotes transparency and accountability by standardizing processes, enforcing compliance, and enhancing traceability of inspection activities. This fosters a culture of accountability within the VID, promoting trust among stakeholders and regulatory bodies.

Confidentiality

Information that is obtained in the study that can be identified with the participant will not be disclosed without their permission. Names and any other identification will not be asked for in the questionnaires.

It is optional to take part in this study. If a person chooses not to take part in the study, their choice will have no bearing on the results. They are allowed to revoke their consent and stop taking part if they so want, with no repercussions.

Please clarify any aspects of this study that are unclear to you before signing this form. You are free to consider it for however long is necessary.

If you have decided to participate in this study, please sign this form in the space provide below as an indication that you have read and understood the information provided above and have agreed to participate.

Voluntary participation

Participation in this study is voluntary. If participant decides not to participate in this study, their decision will not affect their future relationship with VID, If they chose to participate, they are free to withdraw their consent and to discontinue participation without penalty.

Offer to answer questions

Before you sign this form, please ask any questions on any aspect of this study that is unclear to you. You may take as much time as necessary to think it over.

Authorisation

If you have decided to participate in this study, please sign this form in the space provide below as an indication that you have read and understood the information provided above and have agreed to participate.

Name of Research Participant (please print)

Date

----- Signature of Research

Participant or legally authorised representative

If you have any questions concerning this study or consent form beyond those answered by the researcher including questions about the research, your rights as a research participant, or if you feel that you have been treated unfairly and would like to talk to someone other than the researcher, please feel free to contact the Africa University

Research Ethics Committee on telephone (020) 60075 or 60026 extension 1156 email
aurec@africau.edu

Name of Researcher: CHIDO FELISTAS CHAYIRA

APPENDIX 2: Questionnaire for VID Employees.

Section A: Demographics

1. Demographic Information:

a) What is your role/job title within the Vehicle Inspection Department (VID)?

.....

b) How many years have you been working in your current role within the VID?

.....

c) Which department or unit are you primarily associated with within the VID?

.....

2. Perceptions of ERP Systems:

How familiar are you with Enterprise Resource Planning (ERP) systems?

a) Not familiar at all

b) Somewhat familiar

c) Moderately familiar

d) Very familiar

e) Extremely familiar

3. What is your overall perception of ERP systems in enhancing the efficiency of vehicle inspection processes within the VID?

a) Strongly disagree

b) Disagree

c) Neutral

d) Agree

e) Strongly agree

4. To what extent do you believe ERP systems can improve data accuracy and integrity within the VID?

a) Not at all

b) Slightly

c) Moderately

d) Considerably

e) Significantly

f) Usage Patterns and Satisfaction:

5. How often do you currently use ERP systems as part of your daily tasks within the VID?

a) Rarely

b) Occasionally

c) Sometimes

d) Frequently

e) Always

6. Which specific modules or functionalities of the ERP system do you use most frequently?

a) Inventory management

b) Scheduling and appointments

c) Reporting and analytics

d) Compliance tracking

e) Other (please specify)

.....

7. How satisfied are you with the user interface and usability of the ERP system?

- a) Very dissatisfied
- b) Dissatisfied
- c) Neutral
- d) Satisfied
- e) Very satisfied

8. Have you encountered any challenges or difficulties while using the ERP system? If yes, please

specify.....

9. Perceived Impact on Efficiency and Effectiveness:

In your opinion, how has the integration of ERP systems affected the efficiency of vehicle inspection processes within the VID?

- a) Significantly decreased efficiency
- b) Slightly decreased efficiency
- c) No change in efficiency
- d) Slightly increased efficiency
- e) Significantly increased efficiency

10. How do you perceive the impact of ERP integration on the overall effectiveness of the VID in ensuring regulatory compliance and road safety?

- a) Significantly decreased effectiveness
- b) Slightly decreased effectiveness
- c) No change in effectiveness
- d) Slightly increased effectiveness

- e) Significantly increased effectiveness

11. Suggestions and Feedback:

What suggestions do you have for improving the integration and utilization of ERP systems within the VID?

.....

.....

.....

Is there any additional feedback or comments you would like to provide regarding ERP integration and its impact on vehicle inspection processes within the VID?

Section B: Current Vehicle Inspection Processes and Existing Challenges

1. How often do you conduct vehicle inspections at VID?
 - Daily
 - Weekly
 - Monthly
 - Other (please specify)
2. What tools are primarily used for vehicle inspections?
 - Manual tools and paper-based forms
 - Digital tools (please specify)
3. What challenges do you face in the current inspection process? (Select all that apply)
 - Manual data entry errors

- Time-consuming inspections
 - Difficulty in accessing past records
 - Inconsistent reporting standards
4. How would you rate the accuracy of the current inspection process?
- Very Accurate
 - Accurate
 - Neutral
 - Inaccurate
 - Very Inaccurate
-

Section C: Functionalities and Capabilities of ERP Systems

1. Are you familiar with Enterprise Resource Planning (ERP) systems?
- Yes
 - No
2. Which ERP functionalities do you believe would be beneficial for vehicle inspections?
(Select all that apply)
- Process automation
 - Real-time data access
 - Compliance management
 - Resource management

3. How do you think ERP systems can improve vehicle inspection processes?

- Faster data retrieval
 - Reduced paperwork
 - Automated reporting
 - Improved regulatory compliance
-

Section D: Potential Benefits of ERP Integration in Vehicle Inspection Processes

1. What benefits do you expect from integrating an ERP system at VID? (Select all that apply)

- Increased efficiency
- Improved data accuracy
- Enhanced resource allocation
- Better regulatory compliance

2. How important do you think ERP systems are for improving operational performance?

- Extremely Important
- Important
- Neutral
- Not Important

3. Have you observed any improvement in processes where ERP systems have been implemented in similar organizations?

- ☐ Yes
 - ☐ No
 - ☐ Not Sure
-

Section E: Barriers and Challenges in Adopting ERP Systems

1. What barriers do you foresee in implementing an ERP system at VID? (Select all that apply)
 - ☐ High implementation costs
 - ☐ Lack of technical expertise
 - ☐ Resistance to change
 - ☐ Limited technological infrastructure
2. How prepared do you feel the VID is for transitioning to an ERP system?
 - ☐ Very Prepared
 - ☐ Somewhat Prepared
 - ☐ Neutral
 - ☐ Not Prepared
3. What support would be necessary for successful ERP implementation? (Select all that apply)
 - ☐ Employee training
 - ☐ Government policy support

- Vendor support
- Infrastructure upgrade

END OF QUESTIONNAIRE. THANK YOU FOR YOUR VALUED TIME

APPENDIX 3: AUREC



AFRICA UNIVERSITY RESEARCH ETHICS COMMITTEE (AUREC)

P.O. Box 1320 Mutare, Zimbabwe, Off Nyanga Road, Old Mutare-Tel (+263-20) 60075/60026/61611 Fax: (+263 20) 61785 Website: www.africau.edu

Ref: AU 3404/24

6 August, 2024

CHIDO FELISTAS CHAYIRA
C/O Africa University
Box 1320
MUTARE

RE: **ENHANCING VEHICLE INSPECTION EFFICIENCY WITH ENTERPRISE
RESOURCE PLANNING (ERP) INTEGRATION. A CASE STUDY OF VEHICLE
INSPECTION DEPARTMENT (VID) ZIMBABWE**

Thank you for the above-titled proposal that you submitted to the Africa University Research Ethics Committee for review. Please be advised that AUREC has reviewed and approved your application to conduct the above research.

The approval is based on the following.

- a) Research proposal
- **APPROVAL NUMBER** AUREC 3404/24
This number should be used on all correspondences, consent forms, and appropriate documents.
 - **AUREC MEETING DATE** NA
 - **APPROVAL DATE** August 6, 2024
 - **EXPIRATION DATE** August 6, 2025
 - **TYPE OF MEETING:** Expedited
After the expiration date, this research may only continue upon renewal. A progress report on a standard AUREC form should be submitted a month before the expiration date for renewal purposes.
 - **SERIOUS ADVERSE EVENTS** All serious problems concerning subject safety must be reported to AUREC within 3 working days on the standard AUREC form.
 - **MODIFICATIONS** Prior AUREC approval is required before implementing any changes in the proposal (including changes in the consent documents)
 - **TERMINATION OF STUDY** Upon termination of the study a report has to be submitted to



AUREC. Yours Faithfully

MARY CHINZOU
ASSISTANT RESEARCH OFFICER: FOR CHAIRPERSON
AFRICA UNIVERSITY RESEARCH ETHICS COMMITTEE

APPENDIX 4: Project Budget

Activity	Cost \$USD
Designing of questionnaire	5
Printing of questionnaire	20
Transport	30
Online interviews data	30
Total	85

APPENDIX 4: Gantt Chart

