

# Journal of Procurement & Supply Chain



**Effect of Warehouse Management on the Organizational Performance in a Manufacturing Company. A Case of Cimerwa Limited in Rusizi District-Rwanda**

**Olivier Arakaza Hura & Dr. Dushimimana Jean de Dieu**

**ISSN: 2617-3581**

## Effect of Warehouse Management on the Organizational Performance in a Manufacturing Company. A Case of Cimerwa Limited in Rusizi District-Rwanda

Olivier Arakaza Hura<sup>1</sup> & Dr. Dushimimana Jean de Dieu<sup>2</sup>

<sup>1</sup> Master of Science in Procurement and Supply Chain Management, University of Kigali, Rwanda

<sup>2</sup> Senior Lecturer, University of Kigali, Rwanda

*How to cite this article:* Hura O. A., & Dushimimana J. D. (2024). Effect of Warehouse Management on the Organizational Performance in a Manufacturing Company. A Case of Cimerwa Limited in Rusizi District-Rwanda. *Journal of Procurement & Supply Chain*. Vol 8(1) pp. 60-71 <https://doi.org/10.53819/81018102t2324>

### Abstract

The purpose of this study was to analyze the effect of warehouse management on the organizational performance in a manufacturing company. Despite the many efforts used by Rwandan manufacturing industries in warehouse management to store their goods, equipment, inventory, and other items, the achievement remains uncertain, and this affects poorly the performance of Cimerwa Limited. In conducting this research, three objectives were focused on: to assess the effect of inventory on performance of Cimerwa Limited in Rusizi District, to find out the effect of material handling, packing and dispatching on performance of Cimerwa Limited in Rusizi District and finally to assess the effect of automation and optimization on performance of Cimerwa Limited in Rusizi District. To achieve these objectives, literature was reviewed on the subject matter, and then data was collected from 285 employees of Cimerwa Cement and out of them a sample size of 166 respondents were selected by using purposive sampling technique. Questionnaire, observation, interview guide and documentation were used as tools of data collection. Data was analyzed by using both quantitative data and qualitative data by presenting the findings of respondents through the mean and standard deviation. The R Square value, at 0.792, signifies that 79.2% of the variation in organizational performance can be explained by the combined influence of automation and optimization, inventory, and material handling. Regarding inventory, it displays an unstandardized coefficient  $\beta$  of 0.676, with a highly significant p-value of  $0.000 < 0.05$ . Similarly, for material handling, the unstandardized coefficient  $\beta$  is 0.731, and the effect is statistically significant with a p-value of  $0.000 < 0.05$ . Likewise, for automation and optimization, the unstandardized coefficient  $\beta$  is 0.666, and the effect is statistically significant with a p-value of  $0.000 < 0.05$ . Cimerwa should improve inventory management, implement efficient production planning, and enhance warehouse management for better organizational performance, incorporating techniques like EOQ and JIT for cost savings. The study concluded that there is a positive link between warehouse management and the organizational performance of Cimerwa; thus, the warehouse at Cimerwa moves, stores, tracks, and ships items. Therefore, inline of findings researcher recommended that Cimerwa must also ensure that a good production plan is used.

**Key words:** *Warehouse management, organizational performance and manufacturing company.*

## 1. Introduction

Warehousing in Rwanda currently faces lack of employee safety training and knowledge, inaccurate inventory information, high logistics costs and injuries in warehouses are often caused by falls, slips, trips, falling objects, forklift collisions and exposure to contaminants (Kigenza, *et al.* 2023).

A study by Mutai (2017) argues that effective warehouse operations management always improves operational efficiency and reduces costs for manufacturing companies, while increasing customer satisfaction. The primary goal of warehouse operations is to efficiently utilize space, manpower, and equipment while meeting customer expectations. Despite the many efforts used by Rwandan manufacturing industries in warehouse management to store their goods, equipment, inventory, and other items, the achievement remains uncertain, and this affects poorly the performance of Cimerwa Limited (Sanders, 2020). Furthermore, warehousing at Cimerwa Limited currently faces the challenges of a lack of safety training and knowledge for employees, inaccurate inventory information, high logistics costs, and warehouse injuries that are commonly caused by falls, slips, trips, falling objects, forklift collisions, and exposure to harmful substances.

According to Al-Sharif and Hamas (2021), the biggest challenges in warehouse management are poor or inaccurate inventory management, global supply chain delays, and poor time management. Storage issues can also affect the speed, efficiency and productivity of a particular warehouse operation or the entire process chain involved. In most cases, these errors can only be identified after the process has started or even completed (Sivakumar and Ruthramathi, 2019). By then, it is often too late to prevent the error and possibly even reduce the damage done. The basic warehousing process of Cimerwa Limited includes goods receiving, put away, picking, packing and dispatching. In Cimerwa, warehousing is the process of storing goods in a warehouse for distribution, sale or manufacture (Morse, 2021).

They are also used for long-term storage of goods and are often equipped with storage areas, loading docks, conveyor belts and other material handling equipment. Warehousing has always allowed Cimerwa to streamline its warehousing operations, reduce costs and errors, and achieve a higher perfect order rate (Stoltz, 2017). The storage capacity of a warehouse is critical to the overall operation of warehousing. Someone can think that the whole available storage must be used for storage purposes, but in reality, this is one of the blunder mistakes that lead to the failure of many supply chains. The proper approach is we should focus on utilizing the available space in such a way that smooth conduct of other warehousing activities apart from storage, like the ease of movement of workforce and machinery, proper accounting units, can be assured (Leng *et al.*, 2021)

Marzenna Cichosz (2018) explains that modern, highly competitive logistics service market new entrants, including from the technology and automotive industries both industry and consumers indicate that incumbent operators in response to changes and innovative development business model. Take the industry leader in the logistics industry as an example digital business models often complement this traditional, already proven model, resulting in a hybrid solution. Though several studies have been conducted on warehouse management within manufacturing companies in Rwanda, little academic emphasis has been given to the workings of logistics companies. It was in this regard, that the researcher sought to evaluate the manufacturing companies; therefore, this research project intended to assess the effects of warehouse management on organizational performance in a manufacturing company.

### 1.1. Objective of the study

General objective was to analyse the effect of warehouse management on the organizational performance in a manufacturing company.

#### Specific objectives:

- i. To assess the effect of inventory on performance of Cimerwa Limited in Rusizi District.
- ii. To find out the effect of material handling, packing and dispatching on performance of Cimerwa Limited in Rusizi District.
- iii. To assess the effect of automation and optimization on performance of Cimerwa Limited in Rusizi District.

### 1.2. Research hypotheses

- i.  $H_{01}$ : There is no significant effect of inventory on performance of Cimerwa Limited in Rusizi District.
- ii.  $H_{02}$ : There is no significant effect of material handling, packing and dispatching on performance of Cimerwa Limited in Rusizi District.
- iii.  $H_{03}$ : There is no significant effect of automation and optimization on performance of Cimerwa Limited in Rusizi District.

## 2. Literature review

### 2.1 Theoretical framework

A theoretical framework is a structure that can contain or support a research theory. A theoretical framework proposes and describes a theory that explains why the research question under study exists (Vollstedt and Rezat, 2019). Therefore, this section discussed queuing theory, Lean warehousing management theory and theory of constraints.

#### 2.1.1. Queuing Theory

This theory guided research examining the relationship between material handling equipment and effective inventory management. Queuing theory is the mathematical study of queues or queues (Sundarapandian, 2009). The theory allows mathematical analysis of several related processes, including reaching the end of the queue, waiting in the queue (an in-memory process), and serving at the front of the queue. The theory allows the derivation and calculation of a variety of performance metrics, including the average wait time in a queue or system, the expected number of services waiting or received, and the probability that a system will encounter an available server in a particular state such as empty, full, or must Wait for a certain amount of time before serving (Wang, 1986).

In mathematics, queuing theory is the study of queues, or queues as they are commonly called. With the help of queuing theory, mathematicians are able to analyze several related processes, such as enqueue, wait, and head service. Queuing theory takes into account many variables such as: where the queue joins, how long it takes to queue for service, how long it takes to be served, who is serving and many other variables. Therefore, it is safe to conclude that queuing theory is a statistical theory rather than an actual mathematical theory. In a serving environment, we are used to seeing only a few different ways of serving customers, all of which are identified by queuing theory. In a small business with a small number of customers, the queue is usually made up of a server with a counter at it, and the queue of customers is served by a server. For larger quantities, there are other options, such as parallel servers, where

customers line up at a single counter and are assisted by one of multiple servers, or serial queues, where there are many counters and customers choose which one they want to use (grocery store often used this way).

### 2.1.2. Lean warehousing management theory

In order to successfully implement Lean principles, all units in the supply chain (including warehouses) must support Lean through practices (Sharma & Shah, 2015). Lean management assumes that the efficiency of a warehouse depends on its layout, material handling and transport medium (Dharmapriya & Kulatunga, 2011). In order for warehouses to complement a lean culture and contribute to the value chain, inventory waste must be drastically reduced. Lean warehousing thus becomes a key concept in the field of lean thinking. To this end, waste should be minimized when picking, inspecting, packing and dispatching to customers (Garza *et al.*, 2011).

Although lean principles require production units to reduce their dependence on warehouses, these facilities must be relied upon, especially when the lead time for delivering products to customers becomes the main KPI (Dotoli *et al.*, 2013). Even when customer demand follows erratic patterns or delivery times are difficult to predict, inventory becomes an unavoidable part of business (Tostar & Karlsson, 2008). The application of lean in warehouses has a significant impact on the overall improvement of organizational performance (Anđelković *et al.*, 2016). The first step towards a lean warehouse is value stream mapping (Garcia *et al.*, 2004).

### 2.1.3. The Theory of Constraints (TOC)

The Theory of Constraints is a method of identifying the main limiting factor (i.e., a constraint) preventing the achievement of a goal, and then systematically improving that constraint until it is no longer the limiting factor (Bauer, *et al.* 2019). In manufacturing, constraints are often referred to as bottlenecks. The Theory of Constraints takes a scientific approach to refinement (Sarkar *et al.*, 2021). Suppose that any complex system, including a manufacturing process, consists of several interrelated activities, one of which acts as a constraint on the whole system (i.e., the constraint activity is the "weakest link in the chain").

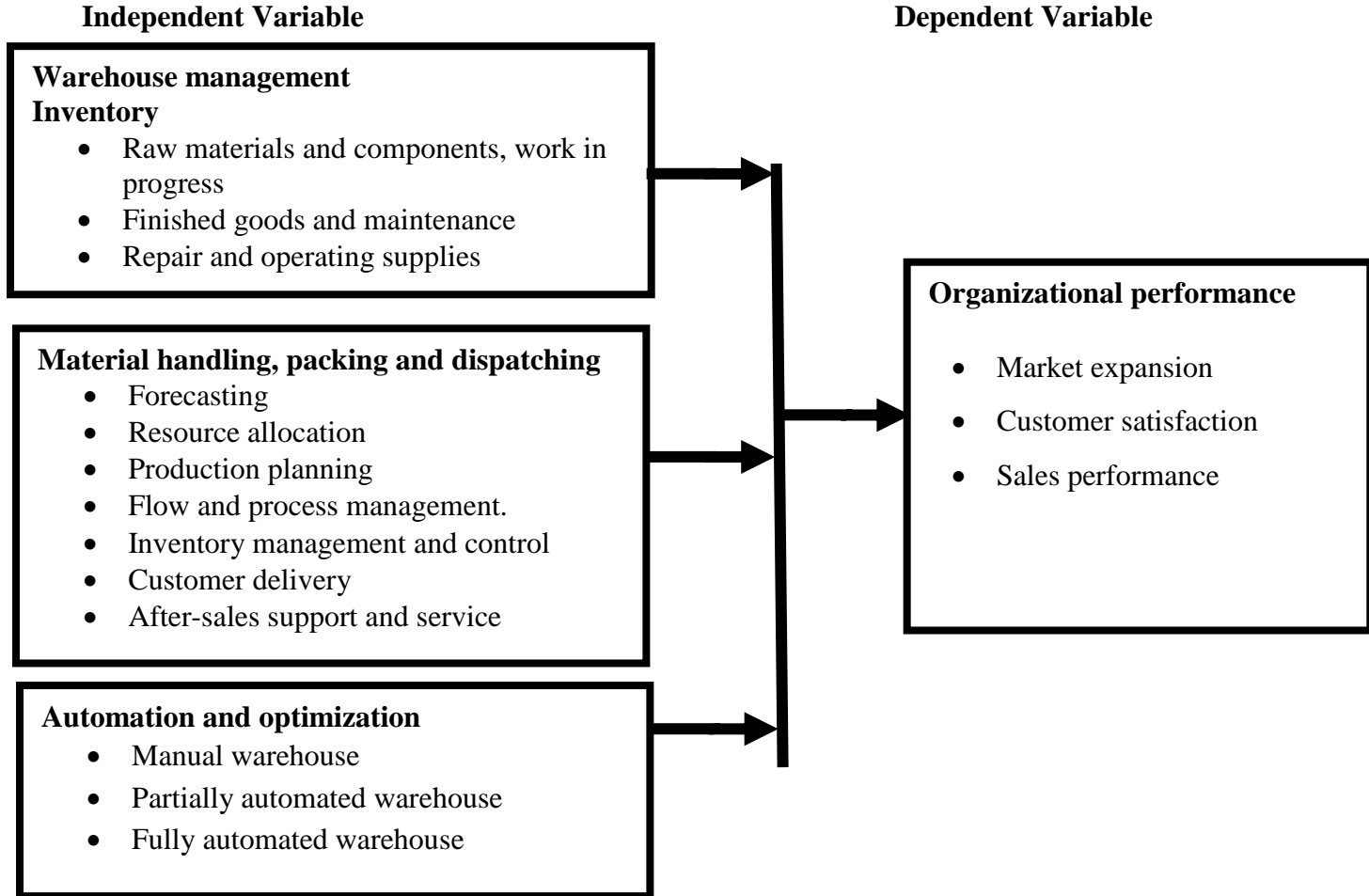
This is a management paradigm that holds that any manageable system is subject to a very small set of constraints in achieving more. There is always at least one constraint, and the TOC uses a focusing process to identify the constraint and reorganize the rest of the organization around it. Constraints can be internal or external. Internal constraints arise when the market demands more from the system than it can provide. If this is the case, organizations should focus on discovering this limitation and follow five focused steps to open (and possibly eliminate) it. Scheinkopf (1999) defined these as required steps, so the process of continuous improvement is a combination of five focused steps and two implementation prerequisites (Watson *et al.*, 2007).

Ikeziri (2019) conceived the Theory of Constraints (TOC) and introduced it to a broad audience through his bestselling 1984 novel, *The Goal*. Since then, the TOC has grown and evolved and is now an important factor in the field of management best practices. An attractive quality of the Theory of Constraints is that it inherently prioritizes improvement activities. The current boundary condition always has the highest priority. In environments where improvements are desperately needed, TOC provides a highly focused approach to creating rapid improvements.

**2.2. Conceptual framework**

Conceptual framework is a schematic presentation which identifies the variables that when put together explain the issue of concern (Peters; 2010). In this case, the independent variable represents warehouse management, while organizational performance refers to the dependent variable, as shown below.

**Figure 1: Conceptual framework**



**Source: Researcher (2023)**

The figure above indicated that the warehouse management currently used by Cimerwa Limited is done through inventory, material handling, shipping, and dispatching and lastly, automation and optimization, and this influences positively the performance of a manufacturing company in terms of market expansion, customer satisfaction, and sales performance generally.

### 3. Research methodology

This chapter focuses on the study design and the methods researcher used to collect and analyze data.

#### 3.1 Research design

Therefore, this study used the descriptive and correlational research design based on the responses of the respondents to describe how warehouse affects the performance of manufacturing company in Rwanda.

#### 3.2. Population of the study

This study adopted a case study based approach and the subject of study was the employees of Cimerwa Plc which has a total of 285 employees including management team, finance and accounting department, supply chain, procurement management, sales and marketing department, and customer area Care management, extension staff, internal audit, financial administration, accounting, logistics and inventory management, coordination and operations, etc.

#### 3.3. Sample size

For determining the number of the respondents, the researcher referred to the formula given by Yamane as follows:

$$n = \frac{N}{1+N(e)^2}$$
$$n = \frac{285}{1+285(0.05)^2} = \frac{285}{1+0.7125} = 166.42 \approx \mathbf{166}$$
$$n = \mathbf{166}$$

N: Study population.

n =Sample size

e: Margin of error (equal to 5%)

Therefore, the sample size of the study was 166 employees of Cimerwa Plc.

The researcher used the purposive sampling technique to choose 166 employees of Cimerwa Plc because they have enough knowledge about the extent on how warehouse affects an organizational performance in a manufacturing company, a case of Cimerwa Plc.

#### 3.4. Research Instruments

The methods were adopted for collection of necessary and valuable data for this research are mainly drawn from primary data and secondary data.

##### Questionnaire

The questionnaire contained closed-ended questions and was composed of four sections as follows: background information about the respondents; the effect of inventory on performance of Cimerwa Cement Limited in Rusizi District, the effect of material handling, packing and dispatching on performance of Cimerwa Cement Limited in Rusizi District and finally the effect of automation and optimization on performance of Cimerwa Cement Limited in Rusizi District.

Before the employees start to answer the questions, the researcher has taken the time to explain the questionnaire. The scaling was composed of the following: 1= strongly disagree (SD), 2= disagree (D), 3=undecided, 4= agree (A), and 5= strongly agree (SA). The researcher used the below interpretation scale.

##### Interview

An interview guide was utilized to conduct interviews with key respondents involved in the warehouse management of CIMERWA. The guide consisted of a series of open-ended

questions designed to explore in-depth information and gather insights from the respondents. The interviews were conducted in a structured manner, allowing for searching and follow-up questions to produce detailed responses.

### Documentary technique

Secondary data means data that are already available; they refer to data that have already been collected and analyzed by someone else. The secondary data can be any document written and collected for another purpose. Here, the research used company' reports, journals, and the internet.

### 3.5 Reliability of Instrument

According to Shanghaiverzy (2003), reliability refers to the consistency of measurements and is usually assessed using test-retest reliability methods. Reliability is improved by including many similar items in the measurement, testing different population samples, and using consistent testing procedures. Reliability also involves whether the findings of the study are reproducible. The term is often used in conjunction with the question of the consistency of the measures formulated for the corporate concept. One factor affecting the reliability of the research is the lack of knowledge among the respondents.

**Table 1: Reliability statistics**

Variables	No of Items	Cronbach's Alpha
Inventory	5	.851
material handling	5	.812
automation and optimization	5	.804
organizational performance	5	.798

In the reliability analysis presented in Table 1, Cronbach's Alpha coefficients were calculated for four different variables: Inventory, Material Handling, Automation and Optimization, and Organizational Performance. For all four variables, the Cronbach's Alpha values exceeded the threshold of 0.7, indicating that the internal consistency and reliability of each scale are acceptable.

### 3.6 Piloting

in the research plan, helping to enhance the quality and reliability of the subsequent full-scale study. Based on the perceptions gained from the pilot study, researcher made necessary adjustments to the instruments, or procedures to address any identified shortcomings. The pilot study for this research carried out at PRIME CEMENT with 17 respondents representing 10% of sample size of the study.

### 3.7. Data analysis

Data analysis is the process of systematically applying statistical and/or logical techniques to describe and illustrate, compress and summarize, and evaluate data (Wickham and Wickham, 2016). Therefore, this study used the descriptive statistics by presenting the findings of respondents through the mean and standard deviation. Furthermore, correlation analysis was used to assess the link between warehouse management and the organizational performance in a manufacturing company. Furthermore, inferential statistics was also used to make estimates about populations and test hypotheses to draw conclusions about populations.

In addition, in order to analyse the effect of warehouse management on the organizational performance in a manufacturing company, the researcher also preferred to use the multiple regression models that assume a linear relationship  $Y = \alpha + \beta X + \epsilon$  between the dependent variable Y (organizational performance in a manufacturing company) and the explanatory variable X (warehouse management), where the error term  $\epsilon$  includes the omitted factor. Check as follows:

$$Y = a + bX_1 + cX_2 + dX_3 + \epsilon$$

Where:

- **Y** : organizational performance
- **X<sub>1</sub>, X<sub>2</sub>, and X<sub>3</sub>**: Independent (explanatory) variables: inventory ( $x_1$ ), material handling ( $x_2$ ) and automation and optimization ( $x_3$ ).
- **A** : Intercept
- **b, c, d**: Slopes
- $\epsilon$  : Residual (error)

Multiple linear regressions follow the same conditions as the simple linear model.

#### 4. Research findings

In this research, inferential statistics play a pivotal role as they are essential for hypothesis testing. They enable researchers to make informed decisions about various factors based on a sample of data. The process of hypothesis testing is fundamental in this study, involving the evaluation of factors using sample data to draw conclusions.

**Table 2: Correlations**

		Inventory	Material handling	Automation and optimization	Organizational performance
Inventory	Pearson Correlation	1	.666**	.567**	.676**
	Sig. (2-tailed)		.000	.000	.000
	N		166	166	166
Material handling	Pearson Correlation		1	.706**	.731**
	Sig. (2-tailed)			.000	.000
	N			166	166
Automation and optimization	Pearson Correlation			1	.666**
	Sig. (2-tailed)				.000
	N				166
Organizational performance	Pearson Correlation				1
	Sig. (2-tailed)				
	N				166

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

#### Source: Primary data (2023)

In Table 2, strong positive correlations are evident between various warehouse management practices and organizational performance. Inventory exhibits a strong positive correlation of 0.676, highlighting that well-structured inventory is closely linked to better organization performance. Similarly, Material handling shows a strong positive correlation of 0.731, indicating that effective Material handling contributes significantly to improved organization performance. Automation and optimization demonstrate a positive correlation of 0.666, emphasizing the importance of resource Automation and optimization in organization performance. These correlations, all statistically significant at the 0.01 level, collectively indicates that enhancements in Inventory, Material handling and Automation and optimization are associated with improved overall organizational performance.

The findings are consistent with Park and Kim's (2013) emphasis on the importance of well-structured warehousing. Park and Kim highlighted that warehouses serve as crucial points for the organized storage and handling of goods, which aligns with the strong positive correlations found between warehouse management practices (Inventory, Material handling, Automation and optimization) and improved organizational performance in the study.

**Table 3: Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.792 <sup>a</sup>	.627	.620	8.56748

a. Predictors: (Constant), automation and optimization, inventory, material handling

**Source: Primary data (2023)**

Table 3 provides the model summary for a regression analysis that includes multiple predictors: automation and optimization, inventory, material handling. The R value in the model summary is 0.792. This value represents the multiple correlation coefficient, which indicates the strength and direction of the linear relationship between the combination of predictor variables (automation and optimization, inventory, material handling). This value is relatively high, indicating a strong overall influence of the predictors on organization performance. The R Square value is 0.627. This value represents the proportion of variance in the dependent variable (organization performance) that is explained by the combination of predictor variables. In this case, approximately 62.7% of the variability in organization performance can be accounted for by the variations in the combined effects of automation and optimization, inventory, material handling. This indicates that the selected predictors collectively have a significant impact on organization performance.

The findings are consistent with Wade and Frank's (2019) emphasis on the critical role of warehousing in the retail industry. Wade and Frank highlight that warehousing serves as a vital tool in creating time utility by efficiently managing goods from purchase or production to consumption or sale. This aligns with the strong influence of automation, inventory, and material handling on organizational performance found in the study, reinforcing the significance of effective warehousing practices.

**Table 4: ANOVA**

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	19996.032	3	6665.344	90.806	.000 <sup>b</sup>
	Residual	11891.076	162	73.402		
	Total	31887.108	165			

a. Dependent Variable: organizational performance

b. Predictors: (Constant), automation and optimization, inventory, material handling

**Source: Primary data (2023)**

The ANOVA results presented in Table 4 provide valuable observations into the relationship between a combination of predictor variables (automation and optimization, inventory, material handling) and organization performance. The high F-statistic of 90.806, associated with a p-value (Sig. = .000), indicates that the overall regression model is statistically significant. In other words, the combination of the selected predictors significantly contributes to explaining the variability in organizational performance. The ANOVA results support the idea that the combination of the automation and optimization, inventory, material handling has a significant influence on organization performance.

The findings are consistent with Szymonik's (2012) emphasis on the interconnected nature of warehouse management, materials management, and inventory management. Szymonik underscores the role of materials and inventory management in maintaining production rhythm

and effective warehouse organization. This aligns with the study's results, which demonstrate that the combination of automation, inventory, and material handling significantly influences organizational performance, highlighting the crucial interconnectedness of these aspects in warehouse operations.

**Table 5: Coefficients**

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	4.135	3.113		1.328	.186
1 inventory	1.236	.271	.299	4.561	.000
Material handling	1.173	.248	.361	4.741	.000
Automation and optimization	.793	.226	.242	3.510	.001

a. Dependent Variable: organizational performance

**Source: Primary data (2023)**

The coefficients presented in Table 5 provide observations into the individual contributions of each predictor variable (inventory, Material handling, Automation and optimization) to organization performance. For the predictor variable inventory, the unstandardized coefficient is 1.236. This coefficient indicates that, holding all other variables constant, a one-unit increase in inventory is associated with an increase of 1.236 units in organization performance. The p-value of 0.000 indicates that this relationship is statistically significant. For predictor variable of material handling, the unstandardized coefficient is 1.173. This indicates that a one-unit increase in material handling is associated with an increase of 1.173 units in organization performance. The p-value of 0.000 indicates that this relationship is statistically significant. For automation and optimization, the unstandardized coefficient is 0.793. This indicates that a one-unit increase in automation and optimization is associated with an increase of 0.793 units in organization performance. Inventory ( $\beta=1.236$ , p value: 0.000), Material handling ( $\beta=1.173$ , p value :0.000), Automation and optimization ( $\beta=0.793$ , p value :0.001). The p-value < 0.05 indicates that this relationship is statistically significant. The findings are consistent with McCloy, Campbell, and Cudeck's (1994) emphasis on the idea that performance is about actions and behaviors aligned with organizational goals. The study's results, particularly the individual contributions of predictor variables (inventory, Material handling, Automation and optimization) to organization performance, reflect how specific actions related to warehouse management directly impact overall performance. This reinforces the notion that warehouse performance is multidimensional, influenced by various components, and their alignment with organizational objectives.

**Table 6: hypotheses finding**

No	Hypotheses	p value	Verdict
i.	H <sub>01</sub> : There is no significant effect of inventory on performance of Cimerwa Limited in Rusizi District.	0.000<0.05	<b>Rejected</b>
ii.	H <sub>02</sub> : There is no significant effect of material handling, packing and dispatching on performance of Cimerwa Limited in Rusizi District.	0.000<0.05	<b>Rejected</b>
iii.	H <sub>03</sub> : There is no significant effect of automation and optimization on performance of Cimerwa Limited in Rusizi District.	0.001<0.05	<b>Rejected</b>

The research hypotheses were tested using a multiple linear regression analysis on the provided dataset. The results indicated that the inventory, Material handling, Automation and optimization all demonstrated significant influences on the organizational performance in a manufacturing company. The coefficients for these techniques were statistically significant ( $p < 0.05$ ), indicating that their utilization has a significant effect on organizational performance. Hence, null hypotheses ( $H_01$ ,  $H_02$ , and  $H_03$ ) were rejected.

## 5. Conclusion

Generally, warehousing makes receiving, storing, and distributing goods easier because all goods are stored in one central location. This helps reduce shipping costs and increases merchandise value as products are available in the right place at the right time. Therefore, the findings revealed that there is a positive link between warehouse management and the organizational performance of Cimerwa; thus, the warehouse at Cimerwa moves, stores, tracks, and ships items, and these four functions form its four broad categories of equipment: storage, material handling, packaging and shipping, and bar-coding equipment. The results indicated that the inventory, Material handling, Automation and optimization all demonstrated significant influences on the organizational performance in a manufacturing company. The coefficients for these techniques were statistically significant ( $p < 0.05$ ), indicating that their utilization has a significant effect on organizational performance. Hence, null hypotheses ( $H_01$ ,  $H_02$ , and  $H_03$ ) were rejected. Inventory, Material handling and Automation and optimization have significant effect on the overall performance of Cimerwa Limited in Rusizi District.

## 6. Recommendations

There are several issues that could be considered to enhance how warehouse management affects organizational performance at Cimerwa. The researcher has made the following recommendations to improve the situation:

- Cimerwa's inventory management goals need to be continuously improved, through efforts to reduce ordering costs and reduce inventory pressure to determine the optimal order quantity and reorder point level for each part, which will help Cimerwa meet customer demand requirements and avoid shortages.
- Cimerwa must also ensure that a good production plan is used. The plan may always describe the day-to-day activities and processes involved in the production, processing, transportation and distribution of cement.

## Acknowledgement

My research for this thesis brought me into contact with several participants. I owe specific gratitude to anyone who helped in the process of this research and how he or she contributed. I am greatly indebted to my supervisor, Dr. DUSHIMIMANA Jean de Dieu, for his excellent academic guidance and his confidence in my ability to carry out the research. Special thanks are extended to my family for their patience and encouragement throughout my stay at the University of Kigali. My thanks also go to my classmates and friends. Finally, to God is the glory for His wondrous gifts of health, ingenuity, and grace, to the point of submission.

## References

- Bauer, G. R., & Scheim, A. I. (2019). Advancing quantitative intersectionality research methods: Intracategorical and intercategory approaches to shared and differential constructs. *Social Science & Medicine*, 226, 260-262.
- Kigenza, R., Nsengiyumva, E., & Sabagiriwa, V. (2023). The Quality Management Improvement Approach: Successes and Lessons Learned from a Workforce Development Intervention in Rwanda's Health Supply Chain. *Global Health: Science and Practice*.
- Kumar, R. (2022). *Operations management*. Jyothis Publishers.
- Morse, L. W. (1987). Distribution & Warehousing. In *Practical Handbook of Industrial Traffic Management* (pp. 271-289). Boston, MA: Springer US.
- Sanders, N. R. (2020). *Supply chain management: A global perspective*. John Wiley & Sons.
- Sharma, A., Kaur, J., & Singh, I. (2020). Internet of things (IoT) in pharmaceutical manufacturing, warehousing, and supply chain management. *SN Computer Science*, 1, 1-10.
- Stoltz, M. H. (2017). Augmented reality in warehouse operations: opportunities and barriers. *IFAC-PapersOnLine*, 50(1), 12979-12984.
- Sundarapandian, V. (2009). *Probability, statistics and queuing theory*. PHI Learning Pvt. Ltd.
- Vollstedt, M., & Rezat, S. (2019). An introduction to grounded theory with a special focus on axial coding and the coding paradigm. *Compendium for early career researchers in mathematics education*, 13(1), 81-100.
- Wang, F. J., Chich-Jen, S., & Mei-Ling, T. (2010). Effect of leadership style on organizational performance as viewed from human resource management strategy. *African journal of business management*, 4(18), 3924.