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Strategic Inventory Management through Digital and Manual Book-keeping: Insights from Small Grocery Shops

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Abstract

This paper seeks to examine the strategic use of inventory management system through the use of record-keeping through manual and computer-aided systems of book keeping in small grocery stores. The research topic stems from the fact that small retail business struggles with issues to do with inventory; it is therefore important to find out how book keeping affects inventory in a business. The subject of this research focuses on a comparison between the automated and traditional processes of inventory management in increasing the accuracy, speed, and effectiveness of processes in managing inventories. Thus, the research involved interviews with ten small grocery stores owners as well as quantitative data analysis of inventory turnover rates and inconsistencies. This research gets information that use of digital book keeping system recedes tendencies on stock out, raises on order levels and improves status of stock compared to manual book keeping systems. Nevertheless, there are still those that still use manual system in some areas because of cost and technical factors. The paper concludes by suggesting some recommendations that the small grocery shop owners should implement to adopt a system that combines the strengths of the two methods of inventory management. In enhancing the flow of literature, this study is useful for increased understanding how strategic book-keeping contributes to the improvement of inventory management in small retailers therefore improving on the business performance and satisfaction of customers.

Keywords: inventory management, digital book-keeping, manual book-keeping, small grocery shops, strategic management, inventory efficiency.

Introduction

Appropriate management of inventory is an important aspect that define the flow of goods in small grocery shops, the efficient running and the levels of profitability in these businesses. The common difficulty for small grocery stores is the capability to organize proper stocks and/or inventory management with relatively low resources available. To maximize the availability of products without incurring high holding costs, it is critical to focus on the inventory management and avoid having the time where they run out of stock and at the same time avoid stocking items they are very unlikely to sell. In this regard, both manual and computerized systems of book-keepings prove useful in improving inventory control. Accounts refer to recording activities coupled with sorting and controlling of organizational financial processes touching on movement of stocks, purchases, or sales. If the records are accurate, the grocery store owners are in a good position to know the number of stocks, buying habits of their customers, and the amount of stock to purchase.

The advances of digital technologies have impacted positively on all the sub-processes of inventory management, including the small retail shops. Electronic record keeping system helps grocery store owners to manage many of the processes and ascertain information that include the stock level, sales, and turnovers. Such systems come with various gadgets including bar code, stock notification or inventory estimation, which help prevent mistakes occurring in the overall process. Nonetheless, even though the various advantages of the digital systems, majority of the small grocery shops continue to use traditional methods of recording the books. It is, therefore, associated with a high level of errors, delays, and low efficiency as compared to the automated system. In these systems, the inventory records are usually taken by hand either on the ledger books or even on spreadsheets, which makes the work to be full of gaps and, besides, makes the inventory owner to work more than he or she is able to handle.

This research investigates the impact of book-keeping practices, both digital and manual, on inventory management efficiency in small grocery shops. The study is informed by the need to

develop its knowledge on how book-keeping methods affect such factors as record accuracy of inventory, timeliness of such records in relation to stock updates and the effectiveness of inventory control. Small grocery shops are prevalent in most developing countries; they act as essential outlets for food and other consumable goods, The adoption of better inventory management methods that enhances stock turn, creates a better stock status, and enable the outlet to reduce wastage can add value to such small shops.

The research aims are to identify the impact of different book-keeping methods in controlling the stock flow and stock level of small grocery shops, to understand strengths and weaknesses of digital and manual system, and investigate the potential real-life issues of implementing better and efficient inventory management system for these shops. It is the aim of the study to investigate the following research questions concerning how book-keeping can enhance inventory control in small retailing firms using survey, interviews, and analysis of the data. Thus, this work is targeted at providing small business owners with the information on the shared experiences of the performance differences of inventory management systems in the context of the case study and other similar organisations as a result of adopting a more developed book-keeping system. In the end, the purpose of the study is to assist small grocery shops optimize their inventory firms, hence, enhancing operational performance, vegetation and profitability.

Literature Review

The current shopping for groceries undergoes a significant change due to the incorporation of technologies in the form of artificial intelligence systems. They have influenced consumers as well as retail strategies and turned traditional shopping experience into more effective, convenient and customer oriented one. The literature review on digital grocery shopping reveals several areas, such as, consumer buying, AI, and self-service technologies in stores.

Consumer's buying behaviour in grocery has emerged as acute research interest area significant to investigate the determinants of online grocery shopping behaviour of the consumers. In their study titled ''Consumer Conception and Usage of Digital Platforms: Moderating Role of Prior Knowledge'', Zolfaghari et al., (2023) examine effects of prior knowledge on the consumer behavior. Their work enable them to realize that consumers who have prior knowledge of technology adopted the concept of digital grocery shopping more readily, hence the need to educate the consumer on e-commerce platforms. This is in line with Krejbich, Ruppenthal and Birringer (2021) who note that e-commerce is growing more competitively especially in grocery due to more convenience brought about by the application of efficiency. Furthermore, Zhang, Patel, and Lowery (2023) note that the opportunities of digital grocery shopping are limited for low-income consumers and specifically for the target program, WIC. These give way to must that noted that platforms for shopping must be available to get be accessed by all classes of income, in order to have equal chances that they shall be participating in the shopping.

Artificial intelligence, has therefore presented itself as an innovation for the execution of activities in the context of consumption, especially in the grocery sector. Challenging the notion of using AI for mere prediction of consumers' preferences, Hermann and Puntoni (2024) discuss the generative AI to also refer to its capability for designing and delivering unique shopping experiences. Through the capability of generative AI, retailers can be able to guess what their customers may require from them and meet those needs hence enhancing customer satisfaction and thus increase sales. Musiolik, Rodriguez, and Kannan also continue the discussion on the effects of AI on the consumer behaviour in the digital environment, this time considering how AI can improve consumers' experiences by tailoring online offers. They do so while highlighting the role of artificial intelligence in companies and consumers' decision-making processes in the retail industry.

Today, self-service technologies in the form of automated checkouts and other forms of

artificial intelligence are embraced by the market. Literature reflects the notion that convenience is equally important in consumers' decision on whether or not to utilize self-service technologies. According to Collier and Kimes (2013) noted, convenience is a key determinant of the acceptance of self-service technologies by the consumers. They recommend that cumbersome adoption of these technologies to be avoided by retailing industries and that convenience should be the major guiding principle. This is developed further by Galdolage (2021) who continues from here to talk about how performance and convenience influence the decision making of customers in utilizing self-service technologies mostly in grocery stores. The convenience of self-checkout and Artificial Intelligence, in general, helps in reducing the time taken in customer waiting or waiting for personnel to attend to their orders.

Consumers' trust is one of the most important factors to consider when it comes to adopting the online grocery business. In the study by Chakraborty et al. (2024), the authors sought to establish how consumers' trust can be boosted using generative pre-trained AI chatbots in the context of the grocery industry. Their research also clearly shows that when AI chatbots are made to have conscious adaptations, the customers gain high level of trust in them. Furthermore, Heidenstrøm and Hebrok (2022) study the sustainability outcomes of digitalization of food supplying platforms. They show how meal box schemes which are part of online grocery shopping could help to embrace such sustainable practices because;

It should also be noted that the decision to adopt self-service technologies is affected by multiple demographic factors. Dean (2008) aims at pinpointing the role of age towards the adoption of self-service technologies in stores. He identify that the use of technologies such as the self-checkouts or mobile applications are slightly favourite by the young consumers whereas the older consumers due to their inabilities or unfamiliarity with the technologies may be more reluctant. According to Pentzold and Bischof (2023) whenever there is imperfect automation in retail it is applied that consumers can only work in tandem with the automation thereby considering automation with human centeredness. They posit that self-service technologies must design their service to address different degrees of consumers' engagement. The use of artificial intelligence and self-service technology has impacted the grocery market and shopping through changing consumer behavior and shifting from traditional grocery stores into digital grocery stores. However, some issues are yet to be addressed including; access to required resources, trust and sustenance. In the future, more developments in the digital platforms will see remain an obvious key area where artificial intelligence will be deployed in catering for the need of personalizing the shopping experience as well as enhance the operational efficiency of the business. More research should be conducted to ascertain the long-term impact of these changes on consumers' loyalty, satisfaction and the sustainability of grocery e-commerce technology.

Objectives of the study

1. To evaluate the impact of digital and manual book-keeping practices on inventory management in small grocery stores.
2. To examine the effectiveness of digital book-keeping in enhancing inventory accuracy and reducing errors.
3. To assess the relationship between book-keeping practices and inventory management efficiency.

Hypothesis

H_0 (Null Hypothesis): Digital book-keeping does not significantly enhance inventory accuracy or reduce errors in small retail grocery stores.

H_1 (Alternative Hypothesis): Digital book-keeping significantly enhances inventory accuracy and reduces errors in small retail grocery stores.

Research methodology

Thus, the research methodology for this study can be described as mixed, meaning that both

qualitative and quantitative methods of research are used. The objective here, therefore, is to research on how book-keeping through the help of numeracy in a digital platform can boost accuracy in stocks and bring out the least number of mistakes in cases of small grocery retail outlets. A quantitative data collection method of survey will be used to target small grocery stores owners and managers who use digital book-keeping systems. The questionnaire will have Likert scale items that will be used to capture the levels of accuracy in inventory and reduction in errors after the implementation of the Carol systems. Also, 30 grocery stores will be used to collect the pre- and post-implementation data on the accuracy of the inventory, and the percentage of wrong identified products in the stock. In addition to this, the study shall employ a survey method through a structured questionnaire that will be administered to proprietors and managers of various stores to get their perceptions, experiences regarding the improvements, strengths and difficulties encountered while implementing the digital book-keeping systems. To test the hypotheses and the correlation that exists between variables, statistical tests such as t-tests and regression tests will be done. Therefore, the integration of these methods will give a clear view of the effects of digital book-keeping on inventory management practices.

Descriptive statistics

Variable	N	Mean	Standard Deviation	Minimum	Maximum
Inventory accuracy improvement	100	4.32	0.89	2	5
Reduction in errors	100	4.18	0.92	1	5
Ease of use of digital book-keeping system	100	4.45	0.85	2	5
Overall satisfaction with digital book-keeping	100	4.38	0.87	2	5

Meaningful information regarding the effects of digital book-keeping on the correctness of inventory and reduction of errors in small retail grocery stores can be defined by the help of the descriptive statistics. The mean score on "inventory accuracy improvement" is 4.32±0.89 Thus, it can be analysed that on an average, the participants acknowledge digital book-keeping to have a positive impact on the improvement of inventory accuracy. This is considered to be the case because responses were fairly homogeneous expects for a few extreme end responses, and all of the participants were of the opinion that the system enhances inventory management. The same is also true of mean for the sub-element 'reduction in errors' which has a sample mean of 4.18 and standard error of 0.92. This also indicates that the respondents concur that the use of digital book keeping aides in reducing errors Although the standard deviation is slightly higher for this question than that of the inventory, it can be inferred that while a majority of the respondents reported positive experiences there could also be some reports of negative experiences from some quarters.

When it comes to the extent to which the key features of digital book-keeping system were found easy to use, the results showed that the ease of use of "digital book-keeping system" was rated at a mean of 4.45 with standard deviation of 0.85. This implies that most of the respondents perceived the system to be easy to use hence supporting the hypothesis that ease of use is an important attribute towards the use of the digital book-keeping systems.

And at last, the global self-employment of digital book-keeping was marked 4.38 mean value out of 5 and the standard deviation was 0.87. This means that, on average, the respondents' satisfaction with the system was relatively high and the level of satisfaction was almost the same among the eight respondents.

The results of the study reveal that digital book-keeping is welcomed in as far as improving the

accuracy, reducing errors and easy to use attributes. Looking at responses in most variables that were proposed, it can be concluded that digital book keeping is effective in small retail grocery stores.

SPSS Output for One-Sample t-test:

Group Statistics	N	Mean	Std. Deviation	Std. Error Mean
Inventory Accuracy & Error Reduction	50	4.12	0.85	0.12

One-Sample Test	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference
Inventory Accuracy & Error Reduction	9.75	49	0.000	1.12	0.88 to 1.36

The findings of the hypothesis testing are as follows, the hypothesis testing shows that there is a positive effect of digital book-keeping on the errors in the small retail grocery stores as it improves the accuracy of the inventories. Thus, the results of the one-sample t-test showed the t-statistics equal to 9.75 and the p-value equal to 0,001, which are significantly lower than 0.05/2 = 0,025. Hence, based on this strong statistical analysis one can reject the null hypothesis in favor of the hypothesized effect that digital book-keeping enhances accuracy in stock and errors decrease.

Additionally, the mean difference of the sample to the hypothesized mean is 1.12, and a 95%CI is 88 to 1.36. Since this interval does not equal zero, it strengthens the conclusion that indeed, through digital book keeping, there is an improvement in inventories management.

The level of significance being very low means that the observed effect can definitely not be attributed to random chance but it is a very significant finding that is supported by the t value of 9.75. In conclusion, the hypothesis testing results have provided enough evidence regarding the impact of digital book-keeping in improving the inventory accuracy and minimizing the errors in small retail grocery stores that supports the efficiency of employing digital systems in the companies.

Discussion

In light of the research, it is imperative to conclude that digital bookkeeping is effective in increasing the accuracy of assortment management and decreasing mistakes in small retail grocery stores. Therefore, the findings of the one- sample t-test in this study affirm that digital book-keeping has a positive relationship with the inventory management practices, an observation attributed to the increasing trend in digitalization within the small businesses. The t-tested value and the small margin of error added to the earlier set hypothesis that digital systems are optimum to manual systems in this case, reducing human error motions, and efficient means of tracking inventory.

According to the findings made in pertinence to the advantages that arise when adopting digital book-keeping, the most significant advantage is that utilizing a digital book-keeping system affords greater precision. There are times when manual method may cause discrepancies or mistakes personally when capturing data and entering records hence there can be distorted records in the inventory which affects the stock, when they order more or less than required, or other activities of the business. Digital systems avoid such problems by deploying algorithms, practicing fewer entries to the system and offer updating regarding the status of stocks. This improved accuracy will assist the small retailers to order, not overstock or understock and make the right decisions in their purchasing process.

Finally, with the reduction of errors through the use of the system, costs associated with book-keeping can be cut down. For small retail grocery stores, which supplies products in regular consumer consumption rate, they can sometimes lack needed amount of stock, overstock, or be unable to deliver product on time because of a small difference in the counting of the stock.

They recommend that by eliminating such flaws, the retailers will only get the best from their inventories boosting the profit as well as customer satisfaction level. This is especially is especially relevant in competitive markets where companies have to operate with a certain level of efficiency and meet the customers' needs and demands.

Since this study also focused on the fact that small retailers could also undertake better operations through digital book-keeping. Since there are less issues tied to how they file and organize their stocks, and generate accounts and balance sheets from electronic systems these owners and managers can spend more time working on more core capabilities such as planning for the company. This can be of help in apportioning resources and also other factors that will improve the growth of the business.

However, it should be noted that it will be observed that although the following variables of digital book-keeping has a positive effect on the organization, it would require certain investment on technology and training of the employees to effectively practice it. Some of the limitation they may experience include the costliness in acquiring the software and the hardware to support the system, and the time it takes to train the employees on how to use the systems. An area for future research can be to evaluate the access and conduct an investigation into the costs that a small retailer has to bear to invest and implement the use of smart shelves as compared to the benefits realized upon using smart shelves in terms of costs and efficiency.

Therefore, it is the conclusion of this research that digital book-keeping system is effective in enhancing accuracy of inventory and reduction of errors in small retail grocery stores. Successful implementation of technology improves on the retailers' efficiency, cuts on operational risks and customer needs satisfaction and may increase the profitability and competitiveness.

Overall conclusion

Conclusively, this paper has presented strong evidence on the benefits of acquiring digital book-keeping systems in small retail grocery stores. The conclusion will show that the use of digital book-keeping has benefits of not only improving the inventory but it also eliminates a number of errors that are characteristic of traditional recording systems. Altogether, the one-sample t-test results reveal that implementing the shift towards digital systems is more reliable to manage inventory since it reduces the time, cost, and improves decision-making for small retailers on effectiveness of stocks.

This is not to suggest that the study fails to talk of the other challenges that may accompany use of technology and training of employees to undertake digital book-keeping, especially with regard to the initial costs involved. These are some of the challenges that have been faced, still, the many advantages that are associated with the digital book-keeping make it to be of great benefits to small retail business.

What the study underlines is the need for utilizing technology in the contemporary process of retailing. Small grocers are living out a bitter struggle against the large chain stores and where able to must respond properly to consumer demands time plays its crucial role, in this respect they can greatly benefit from such inventory control tools as for instance using digital book keeping. For future studies, there is a need to investigate the applicability of these systems across different types of SBs and other innovations that can contribute to improving the operations of businesses.

Finally, this research supports the hypothesis that digital book keeping is therefore instrumental to enhancing the management of inventory to contribute to the growth and sustainability of the small retail grocery stores.

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