

DIGITAL TRANSFORMATION IN GROCERY STORES: ADOPTION AND IMPACT IN SAN JOSE, OCCIDENTAL MINDORO

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ABSTRACT

From the transition of traditional grocery stores to digital platforms, the landscape of the grocery store undergoes a profound advancement. Through digital transformation adoption, these stores redefine customer experiences, offering convenience, personalization, and efficiency, thereby reshaping operations and market dynamics. This research examines the impact of digital transformation on grocery stores operations in San Jose, Occidental Mindoro. The study aims to determine the extent to which the digital transformation including product, manpower knowledge and skills, customer engagement, market analysis affect various aspects of grocery stores operations such as inventory management, marketing, supply chain, human resource management, and capacity management. The findings reveal that digital transformation is reshaping market analysis and redefining how businesses interpret and respond to market dynamics. With its high and positive impact, digital transformation empowers companies to harness the power of data-driven insights, optimize marketing strategies, and capitalize on emerging market opportunities swiftly. Also, digital transformation plays significant role to the adaptability and flexibility of the business operation to the inevitable conditions brought by the changing business environment. The result seemingly presents a moderately positive relationship indicating that when the adaptation of digital transformation increases or high, then there is as well a corresponding increase in grocery store operations performance. Therefore, with the adoption of e-commerce, retail grocery stores can better manage customer experience, improves inventory management, enables personalized marketing, optimizes supply chains, boosts operational efficiency, facilitates data-driven decision-making, and provides a competitive advantage.

Keywords: *adoption, correlation analysis, digital transformation, grocery stores, operations*

SDG: *SDG 8: Decent Work and Economic Growth, SDG 9: Industry, Innovation and Infrastructure*

INTRODUCTION

The digital age has brought big changes, affecting how people and businesses use technology and information. Grocery stores, in particular, have become places where new ideas and changes happen. Instead of just physical stores, groceries are now becoming digital, which is changing how people shop and how the local economy works.

The integration of cutting-edge digital technologies, such as sophisticated inventory management software, seamless online ordering platforms, and advanced point-of-sale systems, is poised to revolutionize the grocery store experience. Digital transformation presents significant challenges and opportunities in the highly competitive, low-margin world of the grocery industry (Kullak et al., 2022). The rapid development of digital technology has caused a substantial transformation in the grocery retail sector in recent years. Previously distinguished by conventional brick and mortar operations, grocery stores are now leading the way in the digital transformation revolution. This transition is not only occurring in urban areas but also in places like San Jose, Occidental Mindoro, where grocery stores are essential for meeting the requirements of the local populace on a daily basis.

The COVID-19 pandemic led to unprecedented change in customer behaviour (Eger et al., 2021). The general uncertainty and distress witnessed at the initial phase of the pandemic was clearly demonstrated in the grocery sector where customers were seen hoarding dry food, canned food, and other products such as toilet paper (Hultman & Egan-Wyer, 2022). Although online grocery shopping has witnessed stable growth in the last decade (Pantano et al., 2020), it skyrocketed during the COVID-19 pandemic. This was evidenced by a sudden rise in new online orders (Ali, 2020). Online grocery store sales tripled at the early stages of the pandemic as food retailers resorted to the already growing e-commerce business.

Thus, San Jose, Occidental Mindoro, like many regions worldwide, experienced a significant shift in its approach to digital transformation during and after the pandemic. The pandemic acted as a catalyst, accelerating the adoption of digital technologies in various sectors, including the local grocery and retail industry. In San Jose, Occidental Mindoro alone there are sixty-five (65) licensed grocery stores that offer a wide variety of products in lieu with the customer needs and demands. Consequently, the researchers were urged to study the research due to compelling reasons that highlight the significance of investigating digital transformation in grocery stores and its adoption and impact in San Jose, Occidental Mindoro. The grocery retail industry is currently undergoing a profound transformation on a global scale, driven by rapid advancements in digital technologies. These changes have the potential to reshape consumer shopping habits, alter the operational landscape of local retailers, and ultimately impact the region's economic dynamics. Therefore, understanding the specific areas of digital transformation in San Jose is essential to grasp how local businesses adapt to these global trends.

METHOD

Study Design

This study employed a descriptive-correlational research design. Descriptive-correlational research is a research method that determines the current phenomenon. Descriptive statistics explained and interpreted the present state of individuals, settings and conditions, or events. Descriptive research aimed to provide an accurate description of a phenomenon, in this case, the relationship between the adoption and impact of digital transformation in grocery stores.

Study Setting

The study was conducted in the urban area of San Jose, Occidental Mindoro. The areas included were Brgy. Pag-asa, Brgy. Caminawit, Labangan, San Roque, Murtha, Central, Brgy. 3, Brgy. 4, and Brgy. 5. The researchers gathered the data needed from the location where saturation of grocery stores was visible.

Unit of Analysis and Sampling

The respondents of the study were the employees of the local grocery stores in San Jose, Occidental Mindoro. The list of the grocery stores was taken from the Municipal Office of the Local Government Unit (LGU) of San Jose, Occidental Mindoro. The list has a total of 65 grocery stores offering different products to the customer. The researchers opted for simple random sampling. From a total of 65 stores only 10 stores passed the system requirements of digital transformation adoption, these stores have a Point of Sale (POS) system, RFIDs, and Barcode Scanning Devices used in their day-to-day operations. These stores have a total of 205 employees with a prevalence level that can estimate maximum sample size (50%), marginal error (d) 0.05, and with 95% confidence interval certainty were considered. Based on these, a total sample size was 134 based on RaoSoft result, the survey was conducted in San Jose, Occidental Mindoro. The study took the grocery store owners, managers, and employees registered in the locality of San Jose, Occidental Mindoro as respondents of the study from a total of 65 stores only 10 stores passed the system requirements of digital transformation adoption, these stores have a point of sale (POS) system, RFID's, and barcode scanning devices used in their day-to-day operations.

Research Instrument

The researchers utilized a researchers-made survey questionnaire based on the related literature and studies. The instrument was consisted of two parts. The first part of the questionnaire was to determine the adoption of digital technologies, while the second part identified the extent of operations of grocery stores in terms of inventory management, marketing, supply chain, human resource management, and capacity management. The researchers used Likert's format for the questionnaire wherein the respondents were asked to rate whether the statements are agreeable in a scale of 1 to 4 having 4 as the highest which means that they strongly agree and 1 as the lowest which means that the respondents strongly disagree. The questionnaire has undergone validation with the experts from the field of business management.

The Cronbach's alpha coefficient of .948 obtained from the reliability test is consistently excellent, indicating a remarkable degree of internal consistency among the items comprising the scale. This result suggests that the items in the questionnaire consistently measure the same underlying construct or trait. Participants' responses to each item are highly correlated, indicating a strong level of consistency within the scale. As a result, researchers can have high confidence in the reliability and stability of the instrument.

Data Collection Procedure

Upon approval of the request letter by the appropriate authorities, the researchers proceeded with the data collection phase of the study. The questionnaires were personally distributed to the identified respondents to ensure that each participant received proper instructions and clarifications regarding the content and purpose of the survey. The researchers explained the objectives of the study, assured the respondents of the confidentiality of their responses, and emphasized that participation was voluntary. After giving the respondents ample time to accomplish the questionnaires, the researchers personally collected the completed forms to ensure a high retrieval rate and to address any incomplete or unclear responses.

Data Processing and Analysis

Descriptive statistics, including the mean and standard deviation, were employed to summarize and describe the characteristics of the data. To address the inferential aspect of the study, Pearson product-moment correlation coefficient (Pearson r) was utilized to determine the strength and direction of the relationship between the variables under investigation.

Ethical Considerations

The survey questionnaire begins with a letter to the respondents explaining the study's scope and purpose. Informed consent also ensured that respondents' identities would be kept anonymous. According to the ethical research standards and the Data Privacy Act of 2012, they will keep the information they provide confidential (Republic Act No. 10173). The researchers explained that the results of this study will be treated with utmost confidentiality, and will only be used for academic purposes. All gathered information by the researchers was properly disposed of following applicable data privacy procedures.

The study followed the necessary protocols, which include obtaining permission from the appropriate authorities. The subjects of the study were briefed on the scope of their expected participation; however, they were assured of the anonymity of all details about their identity, as the data or information obtained from the study was used for investigation. Furthermore, they properly acknowledged all sources or references used in this paper by citing them in the text or the bibliography. Furthermore, the researcher stated that there was no conflict of interest in the study and that the study's adopted mantra or guiding principles would undoubtedly be impartiality in acknowledging the results. Furthermore, throughout this investigation, honesty and unbiased reporting, as well as respect for human life, were strictly adhered to. It is in terms of giving in to whatever benefited the subjects.

RESULTS

The Extent of Digital Transformation Adoption of Grocery Stores.

The results shows that the digital transformation adoption is highly perceived by the respondents (3.68±.156). This result was reflected from the high extent in each parameter such as: product (3.88±.211), manpower knowledge and skills (3.56±.251), The items, Digital transformation has positively impacted the overall competence and adaptability of the workforce (3.69±.466), customer engagement (3.56±.225), and market analysis (3.68±.156) [Table 1].

Table 1. The extent of digital transformation adoption of grocery stores.

ITEM	MEAN	SD
Product	3.88	.211
Manpower Knowledge and Skills	3.56	.251
Customer Engagement	3.56	.225
Market Analysis	3.70	.274
GRANDMEAN	3.68	.156

Legend: to a very low level (: 1.00 – 1.75); to a low level (1.76-2.50); to a high level (2.51-3.25); to a very high level (3.26-4.00)

The Extent of Operations in Grocery Store

The results show a high extent of operations in grocery stores (3.66±.240). Further it was observed a very high extent on inventory management (3.71±.290), supply chain (.65±.512), human resource management (3.63±.515), capacity management (3.70±.279) [Table 2].

Table 2. The extent of operations in grocery stores.

ITEM	MEAN	SD
Inventory Management	3.71	.290
Marketing	3.64	.317
Supply Chain	3.65	.370
Human Resource Management	3.63	.315
Capacity Management	3.70	.279
GRANDMEAN	3.66	.240

Legend: to a very low level (: 1.00 – 1.75); to a low level (1.76-2.50); to a high level (2.51-3.25); to a very high level (3.26-4.00)

Significant Relationship between the Digital Transformation Adoption and Operations of Grocery Stores

Table 4 presents the significant relationship between the digital transformation adoption and its operation. It shows that there is a moderately positive relationship between the two variables (P – value of < .01, F – value = .607). The moderately positive relationship indicates that, when the digital transformation adoption increases or high, then there is an increase in their operations [Table 3].

Table 5. Relationship between digital transformation adoption and operation in grocery stores.

Variables	M	SD	1	2
1. Digital transformation adoption	3.68	.156	-	
2. Operations	3.66	.240	.607**	-

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

DISCUSSION

The Extent of Digital Transformation Adoption

Based on the results, the digital transformation adoption viewed transitioning to digital operation positively. This indicates that these advancements are making notable impact to their businesses. While, the result grand mean and its standard deviation imply a positive and consistent view of the grocery stores to the digital transformation adoption. Moreover, these results provide insight on the perceived effectiveness of these strategies to the operation's performance of these grocery stores. The research findings show that digital transformation is expected to change organizations across many different fronts as almost all business model constructs have at least one element that is expected to change moderately or even stronger. The greatest impact will be to organizations' their value proposition, the customer segments they can identify and serve, the way organizations reach their customers, and the resources they use (Liang & Tian, 2024).

More so, the variables indicated a very high level of digital transformation adoption in grocery stores, particularly in enhancing product-related aspects. These findings underscore the significant role of digital technologies in improving convenience, accessibility, and the overall shopping experience for customers. The availability of online catalogs provides convenience for customers to browse and select products remotely. This aligns with the notion that digital formats enhance accessibility, as suggested by Kamble et al. (2019). This corresponds with the integration of digital technologies to enhance product accessibility, as discussed by Verhoef et al. (2019). The availability and accessibility of the customers to price checkers and barcode scanning devices could be of great convenience, that would help them explore a wide range of products in the stores without having the hesitation to pay for it when already in the counter since price could be checked ahead of it.

Based on the findings, it was found that the employees of the grocery stores are equipped with a decent knowledge on how the digital technologies or tools are being used in their operation. It implies that the employees are adaptive and flexible when it comes to changes in their work. However, it also shows that an improvement to their practice can still be done in order to efficiently do their job using digital tools. They may acquire a skill set that would cater their digital literacy, data analytics, and cybersecurity (Imjai et al., 2024).

Based on the findings, the respondents have positively agreed on the operations of the grocery stores. This implies that the grocery stores have been able to manage their operation

in terms of inventory management, marketing, supply chain, human resource management, and capacity management processes. As for inventory management by adopting digital transformation, it implies that there is a general acknowledgement on their operations in San Jose, Occidental Mindoro. It indicates that this variable is not just seen as advantageous but rather play significant role to the adaptability and flexibility of the business to the inevitable conditions brought by the changing business environment.

The adoption of digital transformation initiatives profoundly impacts inventory management practices, offering businesses numerous benefits ranging from enhanced visibility and real-time tracking to improved forecasting and demand planning. By streamlining operations, reducing costs, fostering innovation, and promoting adaptability, digital transformation serves as a catalyst for business growth and competitiveness in today's digital era (Fang et al., 2024). Thus, the standard deviation of operations suggests of a low dispersion of the data around the responses of the inventory management of grocery store. This implies that there is a relatively high consensus amongst the answers of the respondents.

Furthermore, the result in marketing as a parameter of grocery store operations suggests a high and favorable perception of the respondents in the role of its operation. This shall indicate the recognition of the significance of streamlined and efficient marketing process. The moderate variability or dispersion on the answers of the respondents was also shown. It shows that the responses varied accordingly and differences on their answers were found. However, digital transformation has revolutionized marketing strategies in grocery stores, enabling enhanced personalization, mobile app development, loyalty programs, omni-channel marketing, dynamic pricing, and promotions.

Similarly, supply chain contributes relevantly on the operations of grocery store. This result implies that the grocery stores were able to manage their supplies needed depending on the demand of their customers with the use of technology. The grocery stores were able to adapt digital transformation in order to manage demands and products that would fit with the preferences and needs of its customers. Thus, Digital transformation is shaping the latest supply chain management trends. Digital solutions improve access to supplier and consumer data, empowering organizations to make more informed decisions. Many factors drive digital transformation, from advanced data analytics to artificial intelligence (AI) and automation. Digital tools and software can boost efficiency and agility, all while reducing operational costs. In turn, supply chain organizations can become more resilient and agile when facing disruptions (Ning & Yao, 2023).

It can be noted that the grocery stores were able to strategically align its transformation practices but not to the highest extent. This may be due to some other factors like availability of resources and knowledge required for business transformation. Also, the standard deviation presents a low variability among the responses which indicates the

consistent or similar view of the respondents on the role of transformation in staying agile amidst of the challenges and changes happening in the market. Regardless of the magnitude of an HR transformation, digital or otherwise, success can only be achieved when a clear goal is established. Such changes must make financial sense to ensure long-term viability and growth. Human resource management digital transformation enables organizations to increase efficiency, reduce costs, and improve the employee experience.

Thus, the result in capacity management is viewed positively in San Jose, Occidental Mindoro suggesting that the organization is also performing well in this aspect. Effective capacity management ensures optimal resource utilization and can contribute to overall operational efficiency. This indicates that the grocery stores may have strategies in place for managing its supply chain activities. This allows the grocery stores to optimize capacity management processes, reducing manual effort and improving operational efficiency. Digital transformation has a profound impact on capacity management, enabling organizations to improve resource allocation, enhance operational efficiency, and drive business success. By leveraging real-time data visibility, automation, collaboration, and scalability, organizations can optimize capacity management processes to meet changing market demands while minimizing costs and maximizing efficiency. In today's dynamic and competitive business environment, digital transformation is essential for organizations looking to stay agile, resilient, and competitive in managing their capacity effectively (Zhao, N., & Ren, J., 2023).

The moderately positive relationship indicates that, when the adaptation of digital transformation increases or high, then there is as well a corresponding increase in grocery store operations performance. This implies that adapting or transitioning to digitalization can contribute to the effective and efficient operations of grocery stores to the changing business environment. This suggests that technology is a relevant asset of a business that could fosters innovation, efficiency, cost effectiveness, and overall competitive advantage within the market. Technology is used as a business strategy to improve marketing effectiveness and to increase more its performance and by keeping the business costs checked and reduced (Pascucci et al., 2023).

In summary, the relationship between digital transformation and the operation of grocery stores is significant. With the adoption of e-commerce, retail grocery stores can better manage customer experience, improves inventory management, enables personalized marketing, optimizes supply chains, boosts operational efficiency, facilitates data-driven decision-making, and provides a competitive advantage. Embracing digital technologies is crucial for staying competitive and meeting the evolving needs of customers in today's digital age (Wolniak et al., 2024).

CONCLUSION

Based on the research findings, there is a relatively very high extent of digital transformation adoption was found in the study. This concludes that the adoption has a favorable and positive view on the effectiveness and benefits of digital transformation in maintaining its quality products, efficient manpower, effective customer engagements, and top brass market analysis. Result shows a positive agreement of the respondents on the indicator of grocery stores' operations. Therefore, this recognizes the relevance of managing well their inventory, implementing marketing strategies, supply chain, and their capacity. These actions may lead to their business stability and sustainability. The positive relationship between the adoption of digital transformation and grocery stores' operation implies the significance of utilizing technology in the day-to-day business activities, making them stay competitive and relevant in ensuring customers' convenience and satisfaction.

Based on the research findings, it is suggested that the grocery stores may improve their evaluation and feedback system by using digital platform like chatbots that would automatically answer the customers queries about the business. The grocery stores may enhance its marketing efforts in order to improve its sales performance where they can look for possible collaborations with various agencies like Department of Trade and Industry and higher education institutions for a possible conduct of trainings and workshops about marketing. The findings also suggests that the grocery stores may still engage in advancing the digital tools that they are using to competitively operate in the constantly changing business environment. Also, the other grocery stores may also purchase digital tools as the findings proved that the use of digital tools could positively affect their business operation.

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