

Utilization of Digital Ordering System and Operational Efficiency in Café-Restaurant Enterprises

Ella Dorica Pearl L. Cagay¹, Joyce C. Decendario², Almira A. Castillo³

¹ Support Staff - Negros Occidental, Philippines

²La Carlota City College, Negros Occidental Philippines

³La Carlota City College, Negros Occidental Philippines

DOI: <https://doi.org/10.47772/IJRISS.2026.100800790>

Received: 27 August 2026; Accepted: 01 September 2026; Published: 17 September 2026

ABSTRACT

This study examined the utilization of digital ordering systems and operational efficiency among selected café-restaurants in two cities in the Negros Island Region during calendar year 2026. It described the respondents' profile in terms of sex, age, highest educational attainment, and frequency of visiting café-restaurants and assessed digital ordering system utilization in terms of ease of use and convenience, accuracy, and service quality, as well as operational efficiency in terms of resource management and process optimization. A quantitative descriptive-correlational research design was employed with 149 respondents who had actual experience using digital ordering systems. Data were collected using a 50-item structured survey questionnaire. The findings showed that the respondents were predominantly female, aged 20–29 years, at the college level, and visited café-restaurants weekly. The utilization of digital ordering systems was rated high, with ease of use and convenience obtaining the highest rating among the three dimensions. Operational efficiency was likewise rated high, with process optimization receiving a slightly higher rating than resource management. Furthermore, a significant and very strong positive relationship was found between digital ordering system utilization and operational efficiency. The study concludes that the utilization of digital ordering systems is closely associated with the operational efficiency of selected café-restaurants, particularly in supporting resource management and process optimization. The findings underscore the importance of sustaining and improving digital ordering systems to support efficient restaurant operations and service processes.

Keywords: Digital Ordering System, Operational Efficiency, Ease of Use and Convenience, Accuracy, Service Quality, Café-Restaurants

INTRODUCTION

The food service industry has increasingly adopted digital technologies to improve the speed, accuracy, convenience, and efficiency of business operations. Café-restaurants are among the enterprises that have embraced digital ordering systems, including QR-code menus, online ordering platforms, self-service kiosks, and tablet-based ordering. These technologies enable customers to place orders electronically while allowing businesses to organize transactions more efficiently. Shimmura and Oura (2021) found that digital ordering improved labor productivity in multiproduct restaurants by reducing labor hours and increasing sales per labor hour. This indicates that digital ordering systems may contribute to operational improvements beyond customer convenience.

Operational efficiency is particularly important in café-restaurant enterprises because various activities must be managed simultaneously, including order taking, food and beverage preparation, payment processing, inventory management, and customer service. Inefficient processes may lead to order errors, longer waiting times, increased employee workload, and higher operating costs. In the Philippine setting, Silvano et al. (2022) emphasized the importance of efficient processes, people, policies, and resources in restaurant operations. Digital

ordering systems may help address these operational concerns by improving order accuracy, reducing repetitive tasks, and providing faster access to transaction information.

However, the availability of digital ordering technology does not necessarily ensure its effective utilization. Its use may vary depending on employee familiarity, management support, system reliability, and integration with existing operational procedures. Jiangmin (2024) highlighted the potential of web-based food ordering systems to address limitations associated with manual ordering processes. Thus, examining how digital ordering systems are actually utilized in daily restaurant operations is important in understanding their potential contribution to operational efficiency.

Despite the increasing adoption of digital technologies in the food service industry, limited attention has been given to the relationship between digital ordering system utilization and operational efficiency among café-restaurant enterprises. Previous studies have examined digital ordering in relation to labor productivity, restaurant operations, and food ordering systems; however, further investigation is needed to determine how the utilization of these systems is associated with operational efficiency in the café-restaurant context. This gap provides a basis for examining the relationship between the two variables.

Therefore, this study examined the utilization of digital ordering systems and operational efficiency among selected café-restaurant enterprises. Specifically, it assessed digital ordering system utilization in terms of ease of use and convenience, accuracy, and service quality; determined operational efficiency in terms of resource management and process optimization; and examined the relationship between digital ordering system utilization and operational efficiency. The findings may provide café-restaurant owners and managers with information that can support the effective use of digital technologies in improving operational processes and service delivery.

METHODOLOGY

This study employed a quantitative descriptive-correlational research design. The descriptive component was used to determine the respondents' profile and assess the level of digital ordering system utilization and operational efficiency based on the respondents' perceptions. The correlational component was used to determine the relationship between digital ordering system utilization and operational efficiency among selected café-restaurant enterprises. The quantitative approach was appropriate because the study involved numerical data obtained through a structured questionnaire and analyzed using descriptive and inferential statistical procedures.

The respondents consisted of 149 customers from selected café-restaurant enterprises in one of the cities in the Negros Island Region during the calendar year 2026. To qualify, respondents had to have actual experience using digital ordering systems in the selected café-restaurants. A non-probability quota sampling technique with a convenience sampling approach was employed. It was used to select qualified customers who were accessible and willing to participate in the study.

Data were collected using a 50-item standardized questionnaire adapted from Balondo and Lombrio (2025). The questionnaire consisted of three sections. The first section gathered the respondents' demographic profile in terms of sex, age, highest educational attainment, and frequency of visiting café-restaurants. The second section assessed digital ordering system utilization in terms of ease of use and convenience, accuracy, and service quality. The third section assessed operational efficiency in terms of resource management and process optimization.

The items measuring the two major variables were rated using a five-point Likert scale ranging from 5 (Strongly Agree) to 1 (Strongly Disagree). For interpretation of the computed means, the following ranges were used: 4.21–5.00, Very High; 3.41–4.20, High; 2.61–3.40, Moderate; 1.81–2.60, Low; and 1.00–1.80, Very Low.

The study utilized a standardized questionnaire adopted from an existing instrument. The instrument was therefore used in its established form as the basis for data collection. Any available evidence of validity and reliability reported by the original instrument developers was considered in its adoption.

Prior to data collection, the researcher secured the necessary permission from the Dean of the Graduate School and coordinated with the owners or managers of the selected café-restaurant enterprises. After approval was obtained, the researcher personally administered the questionnaires to qualified customers who had actual experience using digital ordering systems. The respondents were informed of the purpose of the study, the voluntary nature of their participation, and the confidentiality of the information they provided. Completed questionnaires were collected personally by the researcher and were subsequently organized and prepared for statistical analysis.

The collected data were organized, tabulated, analyzed, and interpreted using appropriate descriptive and inferential statistical procedures.

Frequency counts and percentage distributions were used to describe the respondents' profile in terms of sex, age, highest educational attainment, and frequency of visiting café-restaurants.

Mean and standard deviation were used to determine the level of digital ordering system utilization in terms of ease of use and convenience, accuracy, and service quality. The same statistical measures were used to determine the level of operational efficiency in terms of resource management and process optimization. The mean represented the average assessment of the respondents, while the standard deviation indicated the variability of their responses.

Spearman's rank-order correlation coefficient (Spearman's rho) was used to determine the relationship between digital ordering system utilization and operational efficiency. This nonparametric measure was appropriate for examining the strength and direction of the association between the two variables based on the respondents' ratings.

RESULTS AND DISCUSSIONS

Demographic Profile of Respondents

Table 1. Frequency and Percent Distribution of the Demographic Profile of Respondents.

Profile	Category	f	%
Sex			
	Male	53	35.57
	Female	96	64.43
	Total	149	100.00
Age			
	15 - 19 years old	37	24.83
	20 - 29 years old	63	42.28
	30 - 39 years old	37	24.83
	40 - 49 years old	12	8.05
	Total	149	100.00
Highest Educational Attainment			
	Elementary Level	2	1.34

	High School Level	31	20.81
	College Level	109	73.15
	Post-Graduate Level	7	4.70
	Total	149	100.00
Frequency of visiting café-restaurants			
	Daily	8	5.37
	Weekly	62	41.61
	Monthly	35	23.49
	Occasionally	44	29.53
	Total	149	100.00

In terms of sex, the respondents were predominantly female, with 96 respondents (64.43%), while 53 (35.57%) were male. This distribution is consistent with Ayob and Baba (2025), who reported a higher proportion of female respondents among customers with experience using self-ordering kiosks in quick-service restaurants. Similarly, Gumasing (2025) found that female respondents predominated in a study involving customers of casual dining restaurants in the Philippines.

Regarding age, the largest group consisted of respondents aged 20–29 years, with 63 (42.28%). Respondents aged 15–19 years and 30–39 years each accounted for 37 (24.83%), while those aged 40–49 years comprised the smallest group, with 12 (8.05%). This distribution is comparable to the findings of Gunawan et al. (2025), who identified respondents aged 20–29 years as the largest age group in their study of self-service technology in fast-food restaurants. Ayob and Baba (2025) likewise reported that respondents aged 21–30 years constituted the largest group in their study of self-ordering kiosk usage.

In terms of highest educational attainment, most respondents were at the college level, comprising 109 (73.15%), followed by those at the high school level with 31 (20.81%), post-graduate level with 7 (4.70%), and elementary level with 2 (1.34%). This finding is consistent with Balondo and Lombrio (2025), who reported that respondents in their study of food service establishments in Biliran Province were predominantly college graduates.

Regarding frequency of visiting café-restaurants, most respondents visited weekly, with 62 (41.61%), followed by those who visited occasionally with 44 (29.53%) and monthly with 35 (23.49%). Daily visitors comprised the smallest group, with 8 (5.37%). This finding is consistent with Mabeza (2024), who reported that most respondents in her study visited coffee shops weekly. Similarly, Tonatos et al. (2024) found that customers of fast-casual restaurants in Batangas commonly visited every other week. These findings indicate that the respondents generally had regular exposure to café-restaurant services without necessarily visiting on a daily basis.

Level of Utilization of Digital Ordering Systems

Table 2. Level of Utilization of Digital Ordering Systems as a Whole and in terms of Ease of Use and Convenience, Accuracy, and Service Quality.

Statements	Mean	SD	Interpretation
Ease of Use and Convenience	4.16	0.48	High
1. The digital ordering system is customer friendly.	4.23	0.66	Very High



2. The ordering instructions are clear and understandable.	4.21	0.65	Very High
3. It is easy to manipulate, staff assistance is minimal.	3.86	0.85	High
4. Navigating the menu is simple and convenient.	4.17	0.69	High
5. Digital ordering saves time when placing orders.	4.22	0.75	Very High
6. The system allows customers to order at their own pace.	4.23	0.77	Very High
7. The system is accessible whenever needed.	4.07	0.72	High
8. Digital ordering reduces the need to wait for staff.	4.17	0.69	High
9. Customers able to easily find the delivery pick up or dine-in options they need.	4.23	0.70	Very High
10. The system retains previous orders or offers a seamless re-order process to improve convenience.	4.25	0.71	Very High
Accuracy	4.12	0.55	High
11. The digital ordering system accurately records the orders.	4.21	0.70	Very High
12. The customer rarely experience errors when using digital ordering.	3.89	0.77	High
13. The order details displayed are accurate.	4.19	0.71	High
14. The system minimizes misunderstandings between customers and staff.	4.16	0.74	High
15. The orders encoded are processed quickly.	4.10	0.84	High
16. The waiting time for orders is reasonable.	4.11	0.74	High
17. Digital ordering speeds up service delivery.	4.23	0.68	Very High
18. Customers receive timely updates regarding their order.	4.00	0.79	High
19. Customers receive the items exactly as ordered through the system.	4.12	0.73	High
20. Overall service is faster because of digital ordering system.	4.20	0.73	High
Service Quality	4.04	0.64	High
21. The café-restaurant with digital ordering system provides efficient service.	4.01	0.83	High
22. The staff can focus more on other customer needs due to digital ordering.	4.09	0.92	High
23. The platform prompts for upsells, combos, or loyalty program integration at checkout.	3.92	0.84	High

24. The order cancellations or real-time menu updates (out-of-stock items) handled and communicated to the staff.	4.02	0.87	High
25. There is an average time saved in processing an order from the customer's cart to the front-of house/kitchen display.	3.95	0.70	High
26. The system reduces order taking errors compared to traditional manual (paper/phone) methods.	3.97	0.93	High
27. It helps staff manage high volume orders during peak hours.	4.23	0.80	Very High
28. The platform's user interface can be configured to match brand guidelines and promotional requirements.	4.17	0.84	High
29. The system ensures business continuity and handles offline transactions or internet outages.	3.99	0.92	High
30. The digital ordering system integrate with existing Point-of-Sale (POS) and inventory management systems.	4.07	0.75	High
Utilization of Digital Ordering Systems as a Whole	4.11	0.50	High

Legend: (4.21-5.00)-Very High; (3.41-4.20)-High; (2.61-3.40)-Moderate; (1.81-2.60)-Low; (1.00-1.80)-Very Low

Table 2 presents the respondents' assessment of digital ordering system utilization in terms of ease of use and convenience, accuracy, and service quality. The ease of use and convenience dimension obtained an overall mean of 4.16 (SD = 0.48), interpreted as high. The highest-rated indicator was "The system retains previous orders or offers a seamless re-order process to improve convenience," with a mean of 4.25 (SD = 0.71), interpreted as very high. This indicates that respondents particularly valued the convenience of using digital ordering systems for repeat orders. In contrast, "It is easy to manipulate, staff assistance is minimal" obtained the lowest mean of 3.86 (SD = 0.85), although still interpreted as high, suggesting that the systems were generally easy to operate but some customers may still require assistance.

The finding is supported by Park et al. (2021), who emphasized the importance of customer-oriented design in restaurant self-service technology to address differences between customer expectations and actual experiences. Gunawan et al. (2025) likewise found that system quality, information quality, and service quality are important factors influencing customer satisfaction and continued use of self-service technology in fast-food restaurants. However, Tamondong et al. (2023) identified challenges related to consumer acceptability and user experience in the adoption of self-service kiosks. This suggests that although digital ordering systems are generally perceived as convenient, usability may still vary among customers.

The accuracy dimension obtained an overall mean of 4.12 (SD = 0.55), interpreted as high. The highest-rated indicator was "Digital ordering speeds up service delivery," with a mean of 4.23 (SD = 0.68), interpreted as very high. This indicates that respondents strongly associated digital ordering with faster service delivery. The lowest-rated indicator was "The customer rarely experiences errors when using digital ordering," which obtained a mean of 3.89 (SD = 0.77), interpreted as high. This suggests that transactions were generally perceived as accurate, although occasional errors may still occur.

This finding is consistent with Gunawan et al. (2025), who emphasized the importance of system and information quality in self-service technology. Park et al. (2021) similarly highlighted the need for restaurant self-service technologies to provide reliable and customer-oriented service experiences. In contrast, Tamondong et al. (2023) reported challenges associated with self-service kiosk use, particularly in terms of consumer acceptability and user experience. The present finding therefore indicates that while digital ordering systems are perceived as accurate, they may not completely eliminate transaction-related difficulties.

The service quality dimension obtained an overall mean of 4.04 (SD = 0.64), interpreted as high. The highest-rated indicator was “It helps staff manage high-volume orders during peak hours,” with a mean of 4.23 (SD = 0.80), interpreted as very high. This indicates that respondents perceived digital ordering systems as particularly useful in supporting service delivery during periods of high customer demand. The lowest-rated indicator was “The platform prompts for upsells, combos, or loyalty program integration at checkout,” with a mean of 3.92 (SD = 0.84), interpreted as high. This suggests that respondents perceived the systems more strongly in terms of service support than promotional and customer-retention functions.

The finding is supported by Gunawan et al. (2025), who found that service quality is an important factor influencing customer satisfaction and continued use of self-service technology. Park et al. (2021) likewise emphasized the role of self-service technology in supporting effective service delivery and improving customer experiences. However, Park et al. (2021) also noted the importance of addressing unexpected system failures and maintaining appropriate employee support. Thus, the high rating for service quality in the present study indicates positive customer perceptions while recognizing that system reliability and staff assistance remain relevant to the overall service experience.

Overall, digital ordering system utilization obtained a mean of 4.11 (SD = 0.50), interpreted as high. Among the three dimensions, ease of use and convenience received the highest rating (M = 4.16, SD = 0.48), followed by accuracy (M = 4.12, SD = 0.55) and service quality (M = 4.04, SD = 0.64). The results indicate that respondents generally perceived digital ordering systems positively across convenience, accuracy, and service quality. This finding is consistent with Gunawan et al. (2025) and Park et al. (2021), who highlighted the contribution of system quality, information quality, and service quality to positive customer experiences with self-service technologies. Nevertheless, the challenges identified by Tamondong et al. (2023) and Park et al. (2021) indicate that positive customer perceptions may coexist with concerns regarding usability, reliability, and unexpected system problems.

Level of Operational Efficiency

Table 3. Level of Operational Efficiency as a Whole and in terms of Ease of Resource Management and Process Optimization.

Statements	Mean	SD	Interpretation
Resource Management	4.05	0.63	High
1. Effective utilization of staff	4.08	0.74	High
2. Efficient inventory management	4.07	0.75	High
3. Proper maintenance of equipment	4.08	0.87	High
4. Minimization of food waste	3.98	0.87	High
5. Cost-effective procurement of supplies	4.00	0.83	High
6. Effective scheduling of staff	3.91	0.82	High
7. Proper utilization of space	4.06	0.88	High
8. Maintenance of a clean and hygienic environment	4.19	0.71	High
9. Effective utilization of resources	3.93	0.97	High
10. Management of energy consumption	4.16	0.75	High

Process Optimization	4.11	0.61	High
11. Streamlined order taking and service process	4.00	0.80	High
12. Efficient food preparation and cooking processes	3.96	0.77	High
13. Effective communication among staff	4.19	0.86	High
14. Minimization of waiting times for customers	4.13	0.66	High
15. Smooth and efficient customer service	4.11	0.89	High
16. Regular review and improvement of operational procedures	4.13	0.79	High
17. Implementation of quality control measures	4.26	0.79	Very High
18. Efficient handling of peak hours	4.10	0.70	High
19. Implementation of online ordering systems	4.07	0.85	High
20. Overall efficiency of operational processes	4.17	0.83	High
Operational Efficiency as a Whole	4.08	0.57	High

Legend: (4.21-5.00)-Very High; (3.41-4.20)-High; (2.61-3.40)-Moderate; (1.81-2.60)-Low; (1.00-1.80)-Very Low

Table 3 presents the respondents' assessment of operational efficiency in terms of resource management and process optimization. The resource management dimension obtained an overall mean of 4.05 (SD = 0.63), interpreted as high. The highest-rated indicator was "Maintenance of a clean and hygienic environment," with a mean of 4.19 (SD = 0.71), indicating that cleanliness and hygiene were the most evident resource-management practices. The lowest-rated indicator was "Effective scheduling of staff," with a mean of 3.91 (SD = 0.82), although still interpreted as high. This suggests that respondents generally perceived resource management positively, with staff scheduling receiving a comparatively lower assessment.

The finding is supported by Balondo and Lombrio (2025), who reported a high level of operational efficiency among food-service establishments and emphasized the importance of effective resource management. However, Melchor et al. (2025) identified challenges involving fluctuating ingredient costs, waste minimization, portion consistency, technology adoption, and staff training in food and beverage establishments. Similarly, Silvano et al. (2022) reported that restaurants in Moalboal, Cebu experienced challenges related to changing commodity costs despite demonstrating efficient operations. These findings indicate that resource-management conditions may vary according to the operational and economic circumstances of food-service establishments.

The process optimization dimension obtained an overall mean of 4.11 (SD = 0.61), interpreted as high. The highest-rated indicator was "Implementation of quality control measures," with a mean of 4.26 (SD = 0.79), interpreted as very high. This indicates that quality control was the most evident process-optimization practice based on the respondents' assessments. The lowest-rated indicator was "Efficient food preparation and cooking processes," with a mean of 3.96 (SD = 0.77), interpreted as high, suggesting that food preparation and cooking processes were generally perceived as efficient but received a comparatively lower assessment.

This finding is supported by Rodriguez et al. (2025), who found that effective operational processes and supply chain management practices contribute to improved service and product quality in quick-service restaurants. Monteiro et al. (2024) likewise reported that continuous-improvement approaches can help identify and address operational problems in food-service operations. In contrast, Carrillo et al. (2025) identified bottlenecks, redundant activities, and workflow problems that required process-improvement interventions. These findings

suggest that although established procedures may support efficient operations, process-related challenges can still occur in food-service establishments.

Overall, operational efficiency obtained a mean of 4.08 (SD = 0.57), interpreted as high. Process optimization obtained the higher mean of 4.11 (SD = 0.61), while resource management obtained a mean of 4.05 (SD = 0.63). Both dimensions were interpreted as high. The results indicate that respondents generally perceived the selected café-restaurants as demonstrating a high level of operational efficiency in terms of resource management and process optimization. The relatively higher assessment of process optimization reflects positive perceptions of quality control and operational procedures, while the comparatively lower ratings for staff scheduling and food preparation and cooking processes indicate aspects that were assessed less favorably.

The overall finding is consistent with Balondo and Lombrio (2025), who reported high operational efficiency among food-service establishments, and Rodriguez et al. (2025), who emphasized the contribution of effective operational and supply chain practices to food-service performance. Nevertheless, Silvano et al. (2022) and Melchor et al. (2025) documented operational challenges involving costs, waiting time, waste, staffing, and other resource-related concerns. These contrasting findings indicate that operational efficiency may vary across food-service establishments depending on their specific resources, processes, and operating conditions.

Relationship Between the Utilization of Digital Ordering Systems and Operational Efficiency

Table 4. Relationship between the Utilization of Digital Ordering Systems and Operational Efficiency.

Variable	Test Statistics (r_s)	p-value	Decision for H_0	Interpretation
Utilization of Digital Ordering Systems vs.	0.865**	<.001	Reject H_0	Significant
Operational Efficiency				

The results revealed a significant and very strong positive relationship between digital ordering system utilization and operational efficiency, with a Spearman's rank-order correlation coefficient of 0.865 and a p-value of < .001. Since the p-value is below the 0.05 level of significance, the null hypothesis was rejected. This indicates that higher levels of digital ordering system utilization were associated with higher levels of operational efficiency among the selected café-restaurants.

The very strong positive correlation suggests that respondents who reported higher utilization of digital ordering systems also tended to provide higher assessments of operational efficiency. This relationship may reflect the contribution of digital ordering systems to more organized ordering processes, reduced transaction-related difficulties, and improved coordination of operational activities.

The finding is consistent with Xu et al. (2024), who found that intensive use of mobile food-ordering applications was positively associated with restaurant dine-in revenue through increased table turnover. Shimmura and Oura (2021) likewise reported that the introduction of digital ordering systems reduced labor hours and increased sales per labor hour in a multiproduct restaurant. These findings support the present result by demonstrating associations between digital ordering technology and improved restaurant performance and labor productivity.

The finding is further supported by La Consolacion (2026), who reported favorable outcomes associated with self-service technologies in selected fast-food chains in Metro Manila, particularly in convenience, accuracy, transaction speed, customer satisfaction, and operational efficiency. This provides Philippine evidence of the potential contribution of digital and self-service technologies to food-service operations.

However, contrasting findings indicate that the effects of technology utilization may vary depending on the specific performance outcome examined. Abeleda and Galay-Limos (2025) found no significant relationship between technology usage and customer satisfaction among fast-food businesses in San Jose, Occidental Mindoro. Similarly, Yan et al. (2024) reported that some components of online food-delivery system services, particularly discount services, did not significantly influence restaurant performance. These findings suggest that

not all technology features or technology-related outcomes necessarily demonstrate the same relationship with business performance.

Overall, the results establish a very strong, positive, and statistically significant association between digital ordering system utilization and operational efficiency among the selected café-restaurants. The findings are supported by studies linking digital and self-service technologies with restaurant performance, labor productivity, and operational outcomes. Nevertheless, because the present study employed a correlational design, the significant relationship should not be interpreted as evidence that digital ordering system utilization directly causes higher operational efficiency.

CONCLUSIONS

Based on the findings of the study, the following conclusions were formulated:

The respondents were predominantly female, aged 20–29 years, at the college level, and visited café-restaurants weekly. This indicates that the study primarily reflects the experiences and perceptions of young adult customers who regularly visit café-restaurants.

Customers generally perceived digital ordering systems as easy to use, convenient, accurate, and supportive of their ordering and service experience, as reflected by the high overall rating for digital ordering system utilization.

The selected café-restaurants were generally perceived to demonstrate high operational efficiency in terms of resource management and process optimization. This indicates that customers generally viewed the restaurants' resources and operational processes as effectively managed.

Digital ordering system utilization had a very strong, positive, and statistically significant relationship with operational efficiency. This indicates that higher levels of digital ordering system utilization were associated with higher levels of operational efficiency among the selected café-restaurants.

ACKNOWLEDGMENT

The researcher would like to express her sincere gratitude and appreciation to all those who contributed to the completion of this research study.

First and foremost, the researcher offers her heartfelt thanks to Almighty God for His guidance, wisdom, strength, and countless blessings throughout the research process. His grace and providence provided the courage, patience, and perseverance needed to overcome the challenges encountered in completing this study.

The researcher extends her deepest appreciation to her family for their unconditional love, understanding, encouragement, patience, and unwavering support. Their sacrifices and continuous motivation served as a source of strength and inspiration throughout her graduate studies and the completion of this research.

The researcher also expresses her sincere gratitude to her research adviser for the invaluable guidance, expertise, patience, constructive suggestions, and encouragement provided throughout the development and completion of this study. Appreciation is likewise extended to the members of the defense panel for their time, valuable insights, and constructive recommendations, which contributed to strengthening the quality and substance of the research.

Finally, the researcher sincerely thanks all individuals and institutions who, in one way or another, contributed to the successful completion of this study. Their assistance, encouragement, prayers, and support are deeply appreciated and will always be remembered.

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