Integration of Patient's Easy Access for Medication Discount Offers and Transactions ID (Peamdots ID) For Senior Citizens in Selected Community Pharmacies in Koronadal City, South Cotabato

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ABSTRACT

Senior citizens in the Philippines are entitled to a 20% discount on medications under the Expanded Senior Citizens Act of 2010. However, the current process is cumbersome, requiring both a senior citizen ID and booklet, leading to inefficiencies and long wait times. To address this, researchers developed the PEAMDOTs ID system to streamline the process of availing discounts in community pharmacies in Koronadal City, South Cotabato. The study aimed to assess the system's performance based on pharmacists' evaluations of scanning speed, data accuracy, efficiency, user-friendliness, and confidentiality, as well as senior citizens' satisfaction. A quasi-experimental design was used, with post-intervention surveys conducted in selected pharmacies. Results showed high ratings for system performance, including scanning speed (3.58), data accuracy (3.63), efficiency (3.65), user-friendliness (3.55), and confidentiality (3.73). Senior citizens reported a satisfaction score of 3.47, reflecting a generally positive response. The study concludes that the PEAMDOTs ID system improves the speed and convenience of accessing medication discounts for senior citizens while also benefiting pharmacists through streamlined processes.

Keywords: PEAMDOTs ID System; Senior Citizens; Community Pharmacist; Discounts; System Performance; Satisfaction

INTRODUCTION

Background of the Study

Senior Citizens (SCs) represent a vulnerable demographic regarding healthcare access and affordability. The unique needs and challenges of SCs range from physical and cognitive limitations to financial constraints. This demographic typically requires more frequent medical attention and relies heavily on medications, making the efficiency and affordability of pharmacy services crucial. Senior citizens are entitled to a twenty percent discount on medicine purchases in accordance with the Expanded Senior Citizen Act of 2010. However, the current system requires them to present both their senior citizen ID card and booklet to avail these discounts, which can be cumbersome and inconvenient (de Villa, 2024). Furthermore, the Philippines, with its cultural emphasis on respect and care for the elderly, places a societal responsibility on healthcare systems to cater effectively to the needs of SCs. The challenges are compounded by the fact that many SCs may not be tech-savvy, making it essential for any new system like PEAMDOTs to be user-friendly and easily navigable. This situation is particularly pronounced in areas like Koronadal City, where the healthcare infrastructure, while improving, still faces hurdles in fully meeting the needs of its elderly population.

The integration of PEAMDOTs aims to address these issues by streamlining the process of medication, access and financial transactions, ensuring that SCs receive timely and affordable healthcare services. This focus on SCs is not just a response to their immediate needs but also a strategic approach to enhancing overall healthcare service quality and accessibility in the region, recognizing the growing demographic of the elderly and their significant impact on healthcare systems.

One of the primary challenges for SCs is enhancing their experience in accessing healthcare and pharmacy services. This involves several vital variables related to systems like the PEAMDOTs ID, including scanning speed, data accuracy, efficiency management, user-friendliness and confidentiality measures. The performance of the PEAMDOTs ID system is crucial for SCs, as it affects how quickly and accurately their IDs can be scanned, how effectively their data is processed, and how easily they can interact with the system. Research by Rita et al. (2019) underscores the importance of speed and accuracy in such systems, which significantly impacts SCs' satisfaction and the system's operational efficiency. Vaportzis et al. (2017) highlight the criticality of user-friendly interfaces in healthcare technologies for the elderly, emphasizing that ease of use is linked to higher adoption rates and better experiences for SCs.

One of the core problems that the PEAMDOTs system aims to address is the inconvenience and inefficiency that SCs face in accessing medications, availing discounts, and processing transactions. SCs often face difficulties managing multiple documents and IDs for various health services, leading to confusion and delays in accessing the necessary care. Additionally, the existing process for availing discounts is often cumbersome, requiring SCs to present multiple forms of identification and proof of age, which can be challenging for those with mobility or cognitive impairments.

The PEAMDOTs system stands to benefit pharmacies in several ways. Firstly, it streamlines the transaction process, reducing the time taken for each customer and thereby increasing the efficiency of pharmacy operations. This idea leads to shorter waiting times and a more fluid customer service experience. Secondly, the system simplifies record-keeping and inventory management. By integrating transaction records with inventory systems, pharmacies can more accurately track medication usage and predict future demand, leading to better stock management and reduced wastage. Furthermore, the system's digital nature makes it easier to comply with regulatory requirements related to the sale of medications and the provision of discounts to SCs.

The absence of an automated system like PEAMDOTs gives rise to several operational challenges, most notably in the manual processing of transactions. This process, which involves pharmacists and staff manually verifying the eligibility of SCs for discounts, checking prescriptions, and processing payments, is time-consuming and error-prone. Manual handling often leads to long queues and increased waiting times, causing widespread customer dissatisfaction. Additionally, it increases the risk of errors, such as incorrect discount applications or misinterpretation of prescriptions, potentially leading to financial discrepancies or health risks.

The researchers acknowledged the need to innovate and enhance the existing systems in community pharmacies to address these challenges. Therefore, the proposed integration of the Patient's Easy Access for Medication Discount Offers and Transactions ID (PEAMDOTs ID) aimed to optimize transactions, facilitate accessibility for senior citizens, and ensure secure handling of sensitive data. This study was dedicated to thoroughly examining the potential effects of the PEAMDOTs ID system on these operational variables within community pharmacies in Koronadal City, South Cotabato, aiming to improve service delivery and customer experience for the elderly significantly.

RELATED LITERATURE

System Performance

The topic of system performance is critical in the field of healthcare technology. The efficiency and efficacy of healthcare systems delivering their intended functions and services is called system performance. Scanning speed is one crucial aspect of system performance that has received much attention. The speed with which scanning equipment can reliably read and process information from identity cards or associated items is critical in healthcare settings, particularly community pharmacies. Zhong and Moon (2022) emphasized the importance of scanning speed, emphasizing that faster scanning results in faster transactions and shorter wait times for patients, including seniors. This improves the overall user experience and operational efficiency by avoiding potential bottlenecks and delays in the pharmacy's workflow. As a result, knowing and analyzing scanning speed in healthcare technology is critical, as it directly impacts patient happiness and the efficiency with which healthcare services are delivered.

Furthermore, in healthcare systems, system accuracy is an essential factor of system performance, as the degree to which a healthcare system correctly captures and processes data without errors is referred to as accuracy. System accuracy cannot be emphasized in the context of community pharmacy, where precision and patient safety are vital. Rodziewicz et al. (2023) underlines the relevance of system correctness by emphasizing how data processing errors can lead to medication errors and reduced patient well-being.

Efficient operational task management in these healthcare settings can significantly impact the speed and quality of service delivery. Ilardo and Speciale (2020) discuss effective processes in community pharmacy, emphasizing their role in improving service delivery while lowering the administrative burden on healthcare practitioners. This is especially true when servicing seniors, who may require more customized attention and care. As a result, efficient operations maximize resource usage and contribute to a smooth patient experience.

Scanning speed

Scanning speed is a fundamental component of system performance in the healthcare technology landscape, particularly in community pharmacies where the efficient processing of patient data is paramount. According to Haleem et al. (2022), scanning speed directly influences the pace at which healthcare transactions occur, significantly impacting patient experiences. Swift and accurate scanning ensures that patients, including senior citizens, spend less time waiting for their prescriptions and healthcare services, enhancing overall satisfaction. Hence, the need to assess and optimize scanning speed is evident as it aligns with the broader goal of improving service delivery within community pharmacies.

Efficiency management in scanning processes is essential for minimizing delays and streamlining patient interactions. This is especially pertinent in community pharmacies, where the efficient handling of prescriptions and patient data is crucial for timely care. Barakat and Franklin (2020) further highlight that faster scanning speeds reduce transaction times, benefiting patients and healthcare providers. Therefore, optimizing scanning speed aligns with the intention to enhance user satisfaction and operational efficiency in community pharmacies. Consequently, the need to assess and optimize scanning speed is evident as it aligns with the broader goal of improving service delivery within community pharmacies. In light of these considerations, the scanning speed of systems like the PEAMDOTs ID plays a pivotal role in shaping the quality of healthcare services provided to senior citizens and the overall operational efficiency of community pharmacies. Consequently, it becomes imperative to explore methods and technologies that can enhance the scanning speed of these systems while maintaining data accuracy and security.

In this context, it is essential to consider the technological advancements and innovations that can contribute to faster scanning speeds. Wang et al. (2016) emphasize the role of modern technology in achieving faster scanning speeds during prescription and payment processes, ultimately reducing waiting times, especially for senior citizens who often require more time and attention due to their unique healthcare needs. This streamlined process aims to improve the overall experience for this vulnerable population. In conclusion, the research findings indicate that pharmacy technician-operated barcode scanning offers a safe and efficient alternative to pharmacist visual checks in the final verification stage of dispensing medications. Incorporating technology into pharmacy procedures like this improves error detection accuracy and frees up pharmacists to provide additional patient care services with a clinical focus.

However, successfully implementing such a system requires more than just advanced technology. Weir et al. (2021) emphasizes the importance of adequately training pharmacy staff to operate the scanning system effectively. Training programs can encompass aspects like troubleshooting, patient assistance, and data security, which are crucial for the system's overall effectiveness and senior- friendly usability.

Data accuracy

Data accuracy is crucial to system performance, and its significance cannot be underestimated. According to Makeleni and Cilliers (2021), accuracy in healthcare systems refers to the degree to which a system correctly captures and processes data without errors, as errors in data processing can have severe consequences, potentially leading to medication errors and jeopardizing patient safety. Hence, maintaining and enhancing

system accuracy is paramount in healthcare technology. Rodziewicz et al. (2023) emphasize that even minor data processing inaccuracies can result in significant errors, leading to compromised patient outcomes. Thus, healthcare systems, including those used in community pharmacies, must be rigorously tested and validated to ensure that they capture and process data accurately. This involves technological solutions, robust quality control measures, continuous monitoring, and regular system audits to identify and rectify discrepancies.

Likewise, the accuracy of healthcare systems is closely tied to patient trust and confidence in the services provided. Patients, especially senior citizens, rely on these systems to manage their healthcare needs and expect that their data is handled with the utmost care and precision. Any breach of this trust due to data inaccuracies can lead to a decline in patient satisfaction and a potential loss of confidence in the healthcare facility (Seh et al., 2020). Therefore, healthcare organizations and community pharmacies must prioritize system accuracy to ensure their patients' safety and well-being.

Efficiency management

Efficiency management is an essential component of healthcare system performance within community pharmacies. According to Bragazzi et al. (2020), efficient management of operational tasks within community pharmacies is essential for providing timely and high-quality healthcare services, particularly to vulnerable populations like senior citizens. The optimization of operational efficiency not only streamlines the workflow but also reduces waiting times for patients, enhancing their overall experience. Therefore, understanding and improving efficiency management within community pharmacies is essential for delivering efficient and patient-centered care. The authors also shed light on the significance of efficient processes within community pharmacies, emphasizing their role in enhancing service delivery while reducing the administrative burden on healthcare providers. In the context of senior citizens, who may require additional assistance and attention, efficient processes can significantly improve their healthcare experience.

Hence, the need to assess and enhance efficiency management within community pharmacies is evident. Karaca and Durna (2019) highlight efficient processes' positive impact on patient satisfaction, emphasizing that streamlined operations contribute to a more positive patient experience. Moreover, efficient management of tasks within healthcare facilities allows healthcare providers to allocate more time and attention to patient care, ensuring that the specific needs of senior citizens are met effectively. Therefore, community pharmacies should continually evaluate and refine their operational processes to create an efficient and patient-centered environment, particularly for the elderly population.

Efficiency management benefits patients and has broader implications for healthcare organizations and community pharmacies. Dalton and Byrne (2017) argue that optimized operational efficiency can save costs, reducing unnecessary delays and resource wastage. By streamlining processes, community pharmacies can allocate resources more effectively, ensuring that they can meet the senior citizens' healthcare needs. Hence, efficiency management is integral to system performance within community pharmacies. Its optimization enhances patient experience and contributes to cost-effective healthcare delivery.

User-friendliness

Wildenbos et al. (2019) emphasize that user-friendly interfaces are pivotal in healthcare technologies, especially for elderly users. User-friendliness refers to the ease with which staff and patients, including senior citizens, can interact with and utilize the healthcare system. The authors also mentioned that it is directly linked to higher adoption rates and better user experiences. Thus, assessing and optimizing user-friendliness is essential to enhancing the healthcare experience of senior citizens and ensuring its effectiveness. User-friendliness extends beyond the interface design; it encompasses the entire user experience (UX). Senior citizens, who may have varying degrees of familiarity with technology, need intuitive and straightforward systems. Technology must be designed with their specific needs and limitations in mind, considering factors like font size, button placement, and clear instructions (Hou et al., 2022).

Hence, the need to assess and enhance user-friendliness becomes evident. Javaid et al. (2022) argue that the speed and accuracy of healthcare systems significantly impact user satisfaction and operational efficiency. For

senior citizens, a user-friendly system can reduce anxiety and frustration related to technology adoption. It can also empower them to independently manage their healthcare needs, which is essential for maintaining their autonomy and well-being. Therefore, prioritizing user-friendliness in designing and implementing the PEAMDOTs ID system is crucial to ensure its effectiveness and acceptance among the elderly population.

Moreover, user-friendliness is closely tied to the success of healthcare technologies. User-friendly systems are more likely to be adopted and used effectively (AlQudah et al., 2021), as the ease of use is directly linked to higher adoption rates among elderly users. This is especially relevant when introducing a new system to senior citizens with varying levels of technological literacy. By ensuring the system is user-friendly, community pharmacies can increase the likelihood of successful adoption and utilization, ultimately benefiting patients and healthcare providers.

Confidentiality Measure

Seh et al. (2020) highlights the critical nature of confidentiality in healthcare systems, particularly in protecting sensitive patient data. They stress the need for robust data security protocols to shield this information from unauthorized access, alterations, theft, or harm to information systems. The risk of data breaches grows as the healthcare business undergoes a digital revolution spanning the Internet of Medical Things, Smart Devices, and Cloud Services. The study highlights that such breaches are a big concern not only for security professionals but for clients, stakeholders, and the entire healthcare community. The research aims to thoroughly analyze healthcare data breaches and utilize these insights to fortify healthcare data confidentiality. It reveals that hacking and IT incidents, along with unauthorized internal disclosures, are the predominant types of attacks. The growing frequency, scale, and financial impact of these breaches signify healthcare data's high value and vulnerability. This study underscores the urgency for healthcare organizations to constantly evaluate and enhance their confidentiality measures to protect the privacy of all users, including senior citizens.

Noroozi et al. (2018) highlights the crucial role of legal and ethical considerations in maintaining confidentiality in healthcare settings. Their study underscores the necessity of establishing clear access protocols and adhering to privacy laws and ethical norms, particularly in systems handling sensitive patient information, such as the PEAMDOTs ID. The research reveals that while confidentiality is a fundamental right of patients and a cornerstone for trust in the physician-patient relationship, breaches sometimes occur, which are not always unethical. This complexity is compounded by Iran's lack of a unified ethical guideline for handling patient confidentiality in clinical settings. The study aims to identify and address the challenges in preserving confidentiality and includes the development of a draft guideline for confidentiality in clinical settings based on the findings from interviews and focus group discussions. These guidelines ensure that healthcare data security aligns with legal standards and enables community pharmacies to operate within legal boundaries.

Tegegne et al. (2022) performed research concentrating on health workers' knowledge, attitudes, and related variables regarding patients' confidentiality in a resource-limited context. The results showed that many people had enough knowledge but negative attitudes regarding protecting patient privacy. Factors like gender, training in medical ethics, direct patient contact, and encountering ethical dilemmas were identified as significant influences on their knowledge and attitudes. The study concludes by recommending the provision of continuous medical ethics training to health workers, both before and during their service, to enhance their understanding and attitudes towards patient confidentiality. This recommendation aims to improve the overall standard of patient care in resource- limited settings.

Enrollment Process

Enrollment processes are integral to effectively integrating systems like the PEAMDOTs ID in healthcare settings. As highlighted by Fix et al. (2016), streamlined enrollment processes play a crucial role in healthcare systems, ensuring that users, especially senior citizens, can easily access essential services. The authors stress the importance of making this process simple and efficient to encourage senior citizens' participation. Hence, efficiency in the enrollment process is a crucial consideration, mainly when targeting senior citizens.

Heydari et al. (2019) points out that such processes' time efficiency is critical in ensuring that senior citizens do not face unnecessary delays or complications. Lengthy and complex enrollment procedures can deter older individuals from accessing the benefits offered by the system. Therefore, the enrollment process should be designed to minimize bureaucratic hurdles and ensure that senior citizens can quickly and easily register, as this aligns with the goal of providing a seamless and positive healthcare experience for the elderly population.

Petersen (2018) emphasizes the criticality of tailoring the enrollment process for healthcare information systems to cater to senior citizens' unique requirements and challenges. This approach should integrate clear, straightforward access protocols and adhere to legal privacy standards to foster trust. The design of the process must feature an intuitive interface, comprehensive guidance, and additional support for those needing help, enabling seniors to engage in their healthcare management actively. Concurrently, in the broader context of healthcare informatics, privacy preservation is a multifaceted issue. It involves adherence to regulatory requirements through technical and organizational measures and a patient-centric perspective on privacy. This perspective considers privacy a dynamic concept, varying with each patient's context and balancing the need for data sharing with patient control in a global healthcare environment. Professionals in the healthcare industry need to think broadly about strategies like patient-reported privacy preferences, privacy portability, and enhanced transparency in privacy-preserving features to stay in compliance with privacy regulations and protect patient privacy in light of emerging technologies like precision medicine and artificial intelligence.

Satisfaction

Patient satisfaction serves as a significant benchmark for determining the quality of healthcare services, contributing to understanding potential areas of improvement, especially in community pharmacy services. Ismail et al. (2020) used a specially made tool to find out how satisfied patients were with pharmacy services in public health centers and to understand why those patients were satisfied. Their research showed that three important factors affect how satisfied patients are: administrative competence, expert competence, and ease of access to the facility. Some of the things that affected satisfaction levels were the patient's age, level of education, how often they went to the drugstore, how they thought their health was, and how much they knew about pharmacists in general. Older and more educated patients tended to express lower satisfaction scores, while those who frequented the pharmacy more often and perceived themselves to be in better health showcased higher satisfaction levels.

The correlation between patient satisfaction and health outcomes has become a prevalent practice of healthcare institutions utilizing patient satisfaction as a metric for assessing hospital efficacy. In a study by Chen et al. (2018), the researchers scrutinized these factors using a retrospective cross-sectional analysis, drawing from the Medical Expenditure Panel Survey Database spanning 2010 to 2014. Of the representative sample, satisfaction levels varied, with 28.2% reporting optimal satisfaction, a majority (61.1%) indicating average satisfaction, and 10.7% expressing poor satisfaction. Demographic attributes, such as younger age, male gender, being black/African American, having Medicaid insurance, and lower socioeconomic status, were statistically linked to poor satisfaction ratings. Interestingly, while a patient's physical health score did not show a significant correlation with satisfaction levels, those with compromised mental health scores or multiple emergency department visits were considerably more likely to report suboptimal satisfaction.

Senior citizens' satisfaction levels regarding pharmacy services are crucial given the significant healthcare needs of their demographic. De Tran et al. (2020) studied the perspectives of elderly consumers to understand their satisfaction with community pharmacy services. Employing Q-methodology, the research gathered insights from 32 elderly consumers across four community pharmacies in the city. The findings revealed two distinct patterns of satisfaction. The first group of elderly consumers expressed satisfaction with the geographical accessibility of the community pharmacies, emphasizing the importance of location. The second group highlighted their contentment with the affordability of the medications provided. However, a shared concern among both groups was the lack of thorough consultations by pharmacy staff, particularly in areas such as instructions for missed doses, proper storage methods, potential side effects, and drug interactions.

Related Studies

Technology Acceptance Model

The TAM framework has been used in a wide variety of research that look at the extent to which various user groups embrace healthcare technology, including healthcare professionals and patients. Reid (2016) conducted a study examining healthcare providers' adoption of Electronic Health Records (EHRs). Perceived utility, such as enhanced patient care and clinical decision making, was identified by the research, significantly influenced healthcare professionals' acceptance of EHRs. In addition, the extent to which people enjoyed using the system was a major factor in whether or not it was adopted. Furthermore, TAM has been extended to evaluate the adoption of electronic prescribing (e-prescribing) systems in community pharmacies. Reid (2016) focused on the acceptance of e- prescribing systems, revealing that the perceived usefulness of these systems in reducing prescription errors and improving medication management significantly impacted their acceptance. The research also underlined the importance of users' perceptions of the simplicity of the system's interface and the speed with which prescriptions may be processed.

TAM has been employed to study the acceptance and adoption of specific healthcare technologies tailored to senior citizens. Zhang (2022) researched the acceptance of mobile health (mHealth) applications among elderly users. Perceived usefulness was found to include things like improved contact with healthcare practitioners and simpler access to health information, which strongly influenced the elderly's intention to adopt mHealth apps. Moreover, perceived ease of use, including the simplicity of app navigation and readability of content, significantly impacted their acceptance. The same model has been utilized to investigate technological acceptance within community pharmacies and healthcare delivery. Using community pharmacies as a case study, Bincalar (2020) examined the adoption of computerized pharmacy management systems. The research found that pharmacists' perceptions of the systems' usefulness in managing medication orders and patient records influenced their acceptance. Similarly, PEU, such as the system's intuitive interface and available training materials, were critical to the technology's widespread acceptance.

TAM has also been applied to understand the adoption of telemedicine and telehealth technologies. Telemedicine has gained prominence, particularly in remote healthcare delivery, and understanding its acceptance is crucial. Pierce (2021) conducted a comprehensive study to identify factors influencing its adoption during the pandemic. The study aimed to assess the change in telemedicine usage over these phases and to apply the theory of reasoned action (TRA) and TAM to understand the adoption process. The survey revealed that its use increased significantly during the pandemic. It was found that telemedicine constituted a small percentage of clinical work before the pandemic but surged during it, with expectations of a notable but reduced usage post-pandemic. Key predictors for increased telemedicine use included years of practice, supportive organizational policies, encouragement from the organization, expected patient volume and perceived quality of patient care. The study also found that individual and practice characteristics, such as gender and telemedicine training, were insignificant predictors. Analysis of the TRA and TAM models suggested that the TAM, especially a modified version, was more effective in modeling physicians' decisions to use telemedicine during the pandemic. The author concludes by recommending that organizations seeking to encourage telemedicine adoption should focus on communicating its benefits, crafting supportive policies, and providing evidence- based research on its utility in medical practice.

Diffusion of Innovations Theory

In a study done by Richardson (2016), the researcher used DIT to investigate the utilization of electronic health records (EHRs) within the healthcare industry. The research found that the characteristics of innovators and early adopters, who were more open to embracing new technologies, contributed much to the early spread of EHRs within healthcare organizations. This study illustrates how DIT can be used to identify the early champions of technology adoption, which can be particularly relevant when introducing innovations like the PEAMDOTs ID system in community pharmacies.

Moreover, DIT has been applied to understand the acceptance of telehealth and telemedicine technologies. Tynes (2019) conducted a study to deepen the understanding of the conditions that advance the successful

adoption of telehealth at a systemic level, utilizing the said theory. The research focused on identifying system-level indicators representing four critical components of the DIT, and these indicators were analyzed concerning five telehealth modalities. The findings underscored relative advantage and compatibility as the most significant factors influencing the adoption of telehealth, providing quantitative insights into the dynamics of innovation adoption. This research enhances the understanding of when the DIT is most relevant in telehealth diffusion and offers a basis for giving informed advice on whether or not to implement telehealth at the state level. Furthermore, this study's outcomes can inform the more strategic allocation of limited healthcare resources by considering the pre-existing conditions in states conducive to adopting healthcare technology innovation.

DIT is particularly relevant in the context of senior citizens and their technology adoption. Scerra (2016) explored the adoption of mobile technology (MT) among older adults, mainly focusing on the use of smartphones within the senior citizen demographic. The study utilized DIT and TAM as a theoretical framework to understand how elderly individuals in the emergency communications (EC) field adopt and adapt to MT. The study found that MT's PU and PEU significantly influenced their adoption by older adults in the EC sector. These findings have practical implications for employers in the EC field, offering a better grasp of the underlying causes impacting MT adoption by older adults. The study equips employers with the necessary knowledge to develop more effective strategies to assist older employees in adopting mobile technology, thus maintaining their competencies and work skills in a rapidly evolving technological landscape.

Enér & Knutsbo (2015) researched the diffusion of wearable health technologies among senior citizens, such as fitness trackers and smartwatches. The study found that older adults who were early adopters of wearable health devices played a vital role in encouraging their peers to explore the benefits of such technologies. These early adopters often served as opinion leaders within their social circles, sharing their favorable experiences with wearable devices, which, in turn, influenced their peers' adoption decisions. This illustrates the applicability of DIT in understanding how senior citizens influence one another in the context of healthcare technology adoption.

Expectation Confirmation Theory

Oliver (1993) researched that consumers' overall satisfaction or dissatisfaction forms their post-purchase intention, whether to complain, repurchase, not to purchase, or a combination of any. Therefore, measuring satisfaction accurately is very important because companies can predict consumers' behavior and then deploy necessary marketing strategies based on the consumer-satisfaction status. Marketing literature has gone beyond the traditional satisfaction-related research and developed extended models which take other factors, such as emotions, into account. Among those, theoretically and empirically, Expectation–Confirmation Theory (ECT), also known as Expectation– Disconfirmation Theory (EDT), is believed to provide an explanation on consumers repurchase intention. ECT is thus widely used in the marketing area, particularly in consumer behavior literature, to study consumer satisfaction and post-purchase intention.

Oliver and Disarbo (1988) perceived performance of the product/service based on their initial expectation and determine the extent to which their expectation is confirmed (confirmation, also called disconfirmation). If the product performs better than expected, a positive disconfirmation is expected to occur. Alternatively, if the consumers' evaluation about the product falls below expectation, a negative disconfirmation occurs. And of course, if the product performance just matches with the expectation a "simple confirmation" is expected to occur.

Synthesis

Central to healthcare technology is system performance, encompassing elements like scanning speed, data accuracy, efficiency management, user- friendliness, and confidentiality. Studies by Zhong and Moon (2022) and Haleem et al. (2022) highlight the importance of scanning speed in ensuring quick and efficient patient service in community pharmacies. Rodziewicz et al. (2023) and Makeleni and Cilliers (2021) emphasize the criticality of system accuracy, noting that errors can have severe consequences on patient health. As discussed by Ilardo and Speciale (2020) and Karaca and Durna (2019), efficiency in operational tasks is vital for high-

quality service delivery, particularly for senior citizens. The role of user-friendly interfaces in technology adoption among elderly users is underscored by Wildenbos et al. (2019) and Hou et al. (2022), indicating the need for intuitive and straightforward systems.

Confidentiality measures, as addressed by Seh et al. (2020), Noroozi et al. (2018), and Tegegne et al. (2022), is a paramount concern in healthcare systems. The importance of robust data security protocols to protect sensitive patient information from breaches is highlighted. The studies suggest the need for continuous evaluation and enhancement of confidentiality measures to safeguard patient privacy.

TAM, DIT, and ECT have been extensively applied in studies related to healthcare technology. Research by Reid (2016), Zhang (2022), and Bincalar (2020) using TAM sheds light on factors influencing the acceptance of various healthcare technologies, including EHRs, e-prescribing systems, and mobile health applications. Studies employing DIT, such as those by Richardson (2016), Tynes (2019), and Scerra (2016), provide insights into the conditions and characteristics influencing the adoption of innovations like electronic health records and mobile technology among different user groups, including senior citizens. Oliver (1993) and Disarbo (1988) emphasized the significance of Expectation Confirmation Theory (ECT) in understanding consumer behavior. They highlight the importance of accurately measuring customer satisfaction, as it allows companies to predict and influence consumer behavior, leading to effective marketing strategies. The theory has been widely utilized in consumer behavior literature for studying satisfaction and post-purchase intentions.

Theoretical Framework

Figure 1. Theoretical Framework
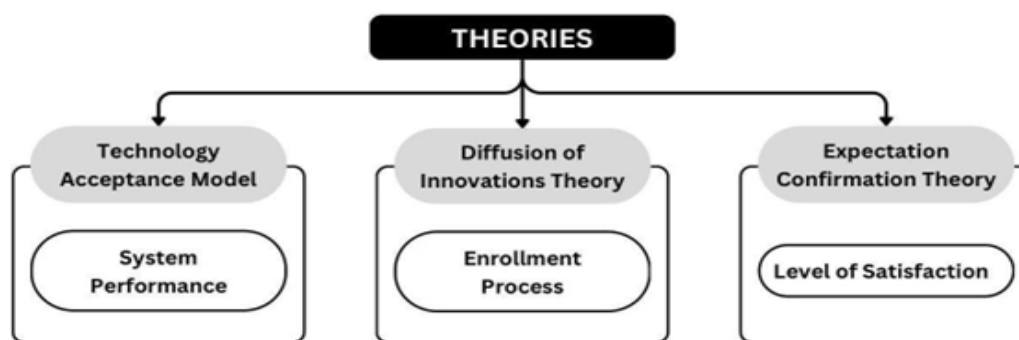
The theoretical framework for the study entitled, Integration of Patient's Easy Access for Medication Discount Offers and Transactions ID (PEAMDOTs ID) for SCs in Selected Community Pharmacy in Koronadal City, South Cotabato, is grounded in three primary theories: Technology Acceptance Model, Diffusion of Innovations Theory, and Expectation Confirmation Theory.

Community pharmacies faced several challenges, especially in developing locales such as Koronadal City. First, there is a need to enhance operational efficiency and customer experience. These pharmacies served as vital healthcare providers, especially for vulnerable populations like the elderly (Ilardo & Speciale, 2020). However, they struggled with system performance issues like scanning speed and accuracy, affecting patient satisfaction (Mosadeghrad, 2014), where the complexity of enrollment processes can deter senior citizens from accessing essential services.

Secondly, technological integration in healthcare is often met with resistance due to the complexity and user-friendliness of the systems. Elderly users, in particular, find it challenging to adapt to new technologies, which affects the adoption rate of systems like PEAMDOTs ID (Vaportzis et al., 2017). Considering the specific needs and limitations of SCs, the technology must be designed with the user in mind.

Lastly, the confidentiality of patient data remains a critical concern. Ensuring robust data security protocols and compliance with privacy standards is essential in maintaining trust in healthcare systems (Maryville University, 2020). This is particularly important in community pharmacies where sensitive information is frequently accessed and shared.

Davis (1986) came up with the Technology Acceptance Model (TAM), which is used a lot in information systems. It tries to show how people learn to use and accept a tool. When people are given a new piece of technology, the model says that two main things—Perceived Usefulness (PU) and Perceived Ease of Use (PEU)—affect their choice of how and when to use it. PU refers to the degree to which a person believes using a particular system would enhance their job performance. In contrast, PEU refers to the degree to which a person believes that using the system will be free of effort. Moreover, TAM is particularly relevant in integrating the PEAMDOTs ID in community pharmacies as it helps SCs understand and predict the acceptance of this technology. Assessing how easy and valuable the system is thought to be by older users can help developers make the technology more user-friendly and valuable, which increases the chances that it will be accepted and used effectively in that group.

Diffusion of Innovations Theory (DIT), established by Rogers (1962), is a paradigm for understanding how, why, and at what rate new ideas and technology move through civilizations. DIT proposes that innovation is conveyed through certain channels throughout time among the members of a social system. The theory categorizes adopters into five segments based on their speed of adoption. Also, DIT is very important for planning how to use PEAMDOTs ID in Koronadal City. Understanding the types of adopters in the community, especially the early adopters and early majority who may be able to persuade others, can speed up the adoption rate. Knowing these groups' traits, especially for older people, can help one change how one talks to people and train them so that the technology is used more effectively and by more people.

The Expectation Confirmation Theory, introduced by Oliver (1977), posits that customer satisfaction is influenced by the confirmation or disconfirmation of their prior expectations. This theory can be applied to assess whether people's actual experiences confirm or disconfirm these expectations. This theory can suggest that if senior citizens find that the integration of the PEAMDOTs ID indeed enhances their access to discounts and healthcare services, and these experiences align with their initial expectations, it is likely to influence their satisfaction positively. Conversely, if there is a disconfirmation, where their experiences fall short of expectations, it may lead to dissatisfaction. Hence, this interaction is essential for comprehending how convenience and innovation impact senior citizens' satisfaction in community pharmacies.

Conceptual Framework
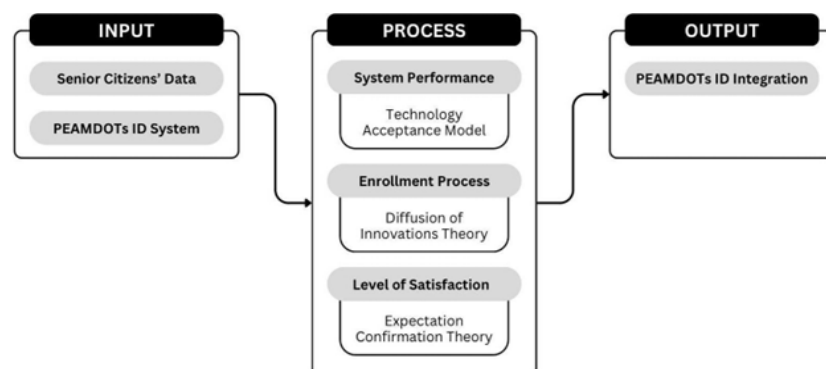
Figure 2. Conceptual Framework

Figure 2 illustrated the conceptual framework of the study, structured according to the input-process-output (IPO) model. In the input stage, the primary focus is on gathering and recording data from senior citizens. This involves the PEAMDOTs ID System, which plays a crucial role in this phase. Pharmacists are the ones responsible for collecting pertinent information from senior citizens, which include their personal details. This collected data is then entered into the PEAMDOTs ID System, ensuring that all necessary information is accurately captured and stored for further processing. The process stage delves into the theoretical underpinnings of the study. Three key theories are employed to provide a comprehensive understanding of the system's adoption and acceptance by its users. These theories help analyze how effectively the PEAMDOTs ID System meets the needs and expectations of senior citizens. They explore various dimensions, such as user satisfaction, ease of use, and overall system efficiency. By applying these theories, the study aimed to identify the factors that influence the successful integration and usage of the PEAMDOTs ID System. The output stage

focuses on the results derived from the study, culminating in the development and integration of the PEAMDOTs ID System prototype.

Statement of the Problem

This study aimed to integrate the Patient's Easy Access for Medication Discount Offers and Transactions ID (PEAMDOTs ID) for SCs in Selected Community Pharmacy in Koronadal City, South Cotabato. Specifically, the researchers aim to address the following:

1. What is the level of the PEAMDOTs ID system performance in terms of its operational aspects for pharmacists in enhancing the SCs healthcare access experience?

1.1 Scanning Speed

1.2 Data Accuracy

1.3 Efficiency Management

1.4 User-Friendliness

1.5 Confidentiality Measures?

2. What is the level of satisfaction of senior citizens in Koronadal City in the utilization of PEAMDOTs ID system integrated into their current set up?

Hypotheses

Null Hypothesis

H0: There is no significant relationship in the system performance and level of satisfaction of the PEAMDOTs ID system before and after its integration.

Alternative Hypothesis

H1: There is a significant relationship in the system performance and level of satisfaction of the PEAMDOTs ID system before and after its integration.

Significance of the Study

This research was designed to comprehensively evaluate the PEAMDOTs ID system in community pharmacies, offering insights into operational efficiencies, patient enrollment processes, and data security measures. The study holds value for various stakeholders:

Senior Citizens

The result of this study could significantly benefit senior citizens by streamlining pharmacy visits, reducing waiting times, and simplifying the process of availing medication discounts that could enhance their overall healthcare access and experience.

Healthcare Providers and Professionals

The findings can inform healthcare providers about innovative solutions like the PEAMDOTs ID system, enabling them to enhance service delivery, streamline processes, and improve overall patient care.

Stakeholders (Government, Healthcare Authorities, NGOs)

The study's outcomes can inform policies and strategies for implementing similar systems in other regions or sectors, enhancing the healthcare experience for senior citizens nationwide.

Future Researchers

The findings will contribute to the body of knowledge on technology integration in healthcare settings, offering a basis for further studies in similar contexts.

Scope and Limitations of the Study

The study was conducted on eight (8) selected community pharmacies in Koronadal City, South Cotabato, which focused on the integration of the PEAMDOTs ID system specifically for pharmacists. Also, the study was conducted with the participation of one hundred and fifty (150) SCs to measure their level of satisfaction. The research will be carried out over one (1) month, encompassing the data-gathering procedure of the PEAMDOTs ID system. The study enrolled one community pharmacist in each pharmacy to participate in the research to ensure a representative sample for reliable data collection and analysis and provide a robust basis for evaluating the system's performance and user satisfaction of the PEAMDOTs ID.

The study's primary limitation lay in its geographical focus exclusively with the selected pharmacies and senior citizens in Koronadal City, South Cotabato. As a result, the findings might not be applicable or generalizable to other regions or settings with different demographic, economic, or healthcare dynamics. Another limitation is the subjective nature of the data collected, particularly in measuring satisfaction levels among senior citizens. This subjective feedback may introduce biases that could affect the study's outcomes. Additionally, external variables beyond the research's control, such as sudden economic changes, health emergencies, or local events, may also impact the study's results.

Research Duration

The research was conducted over a duration of approximately one (1) month, encompassing various phases from preparatory work to data collection, analysis, and reporting. This timeframe had been chosen to ensure the thoroughness and efficiency of the research process while adhering to project timelines and resource constraints. It allowed for adequate data collection and analysis without undue delay, facilitating the timely completion of the study's objectives.

Definition of Terms

The following terminologies were used operationally.

PEAMDOTs ID (Patient's Easy Access for Medication Discount Offers and Transactions ID): A specialized identification system designed for senior citizens, facilitating access to discounted offers and transactions in community pharmacies. This system aims to streamline processes, making them more efficient and user-friendly for senior citizens.

Integration: The process of incorporating or combining various functions and features within the specialized identification system for senior citizens.

Community Pharmacy: A healthcare facility that dispenses medications to the public at the retail level, in addition to providing patient consultation and advice on the use of prescription and over-the-counter drugs.

Senior Citizens: Individuals who have reached a certain age, typically defined by law or policy, are often entitled to certain benefits, including healthcare discounts. The specific age may vary by region or country.

METHODOLOGY

Research Design

The researchers utilized a quasi-experimental research design to investigate the impact of the PEAMDOTs ID system on pharmacists' healthcare access experience within selected community pharmacies in Koronadal City, South Cotabato. This design involves the manipulation of an independent variable (PEAMDOTs ID

system integration) to observe its effects on dependent variables (system performance and level of satisfaction). Quasi-experimental designs are suitable for studying the effects of interventions when randomization is not feasible, making it an appropriate choice for this study.

Firstly, a structured survey questionnaire containing Likert scale questions were administered to pharmacists who have experienced the PEAMDOTs ID system integration in selected community pharmacies in Koronadal City, South Cotabato. This survey was encompassing questions tailored to each specific objective, allowing respondents to rate their experiences and opinions on a scale, 4- Always, 3- Often, 2- Sometimes, 1- Never and 4- Very Satisfied, 3- Satisfied, 2- Dissatisfied, 1- Very Dissatisfied. The Likert scale data collected from the survey responses will provide valuable insights into the perceived levels of system performance, the influence on adoption during the enrollment process, and the effectiveness of confidentiality measures.

Secondly, the Likert scale data undergone a rigorous process of descriptive statistics analysis. Measures of central tendency, such as the mean, will be calculated to determine the average response for each Likert scale question. This will help quantify the overall sentiment of pharmacists regarding the different aspects of the PEAMDOTs ID system. Additionally, measures of variability, including the standard deviation, will be computed to assess the dispersion of responses and gauge the level of consensus or variation among participants' opinions.

Lastly, the results of the descriptive statistics analysis presented in a clear and comprehensible manner in the form of tables. These visual representations will aid in conveying the summarized information effectively. This stage is essential for the research process as it bridges the gap between data collection and the derivation of meaningful conclusions. This interpretative process will aim to draw connections between the diverse data sets, providing a holistic understanding of the system's performance. The goal is to identify how these aspects function and understand their impact on pharmacists' experience and satisfaction with the PEAMDOTs ID system in Koronadal City, South Cotabato community pharmacies.

To further visualize the research design, Figure 3 below contained a graphic flowchart on how the researchers aim to conduct the study:

Figure 3. Schematic Diagram of Research Design
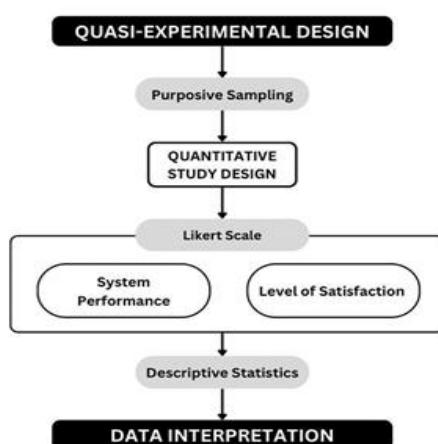
Research Locale

The study was conducted within the City of Koronadal, Province of South Cotabato, Philippines, which serves as the research locale. Koronadal City is a diverse city in the region – known for its blend of cultural, economic, and healthcare activities.

The selected community pharmacies within Koronadal City served as the primary research sites where the integration of the PEAMDOTs ID system is implemented and where data collection will take place. The PEAMDOTs ID system's effects on service, contentment, and convenience for customers may be studied in this context within a region characterized by a growing senior citizen population.

Presented below is the site map of the research locale:

Figure 4. Map of the Philippines and Koronadal, South Cotabato
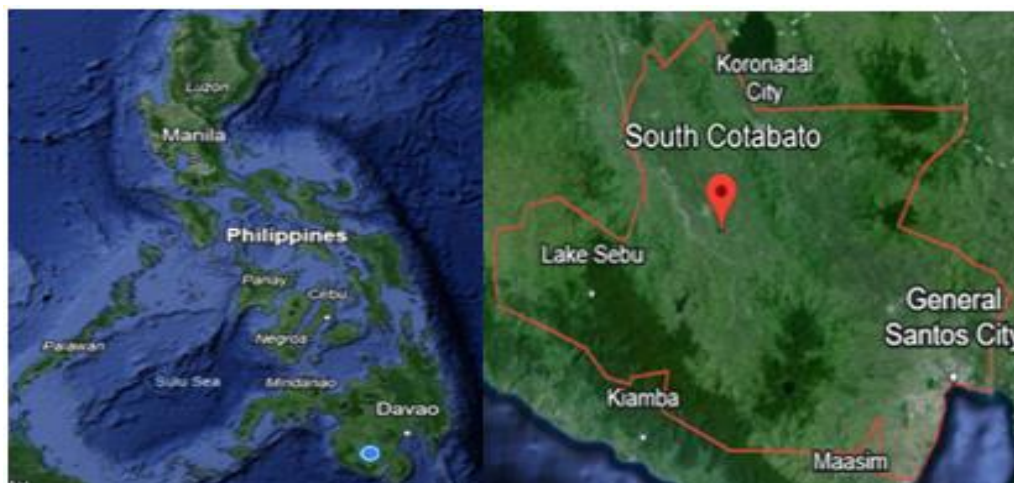
Respondents of the Study

This study involved eight (8) community pharmacists from Koronadal City, South Cotabato, divided into two groups: an uncontrolled group and a controlled group. Each group consists of eight (8) pharmacies, with at least one or two pharmacist/s participating per pharmacy. Also, this study involved 150 senior citizens who participated in the survey.

Pharmacists are chosen as the primary study participants due to their direct experience with implementing and navigating the PEAMDOTs ID system for senior citizens. The controlled group of 8 pharmacists did not implement the PEAMDOTs ID system during the study period, while the uncontrolled group of 8 pharmacists will continue using the system as usual. This controlled versus uncontrolled design allows for a robust comparison of the system's impact on medication access and satisfaction among senior citizens before and after its implementation. Through individual questionnaires, we aim to gather the diverse perspectives of these pharmacists, capturing their experiences, challenges, and suggestions for improvement related to the PEAMDOTs ID system.

By prioritizing the insights of these directly involved individuals, this study hopes to provide valuable information for evaluating the system's effectiveness and ultimately recommending strategies to optimize medication access and satisfaction for senior citizens in community pharmacies.

Recruitment

Participants were recruited primarily through community pharmacies in South Cotabato. The research team accessed data that met the study's criteria by building on the groundwork laid by collaborating with local community pharmacies. Before participating in the study, potential participants were given comprehensive information about the research, its objectives, and procedures. This open approach ensured that people agreed to participate voluntarily after fully understanding the nature and implications of the research.

Inclusion criteria

The study included pharmacies located in Koronadal City, South Cotabato, that met specific criteria. These criteria included a willingness to integrate the PEAMDOTs ID into their pharmacy system and the ability to provide medication discount offers to senior citizens possessing PEAMDOTs IDs. The pharmacies had to have at least two pharmacists on duty during all operating hours and have internet access and a computer for PEAMDOTs ID registration and transaction processing. Additionally, the pharmacies could be either chain-owned or individually owned but had to have at least one year of experience operating as a community pharmacy. They also had to be willing to participate in individual interviews or questionnaires during the data

collection phases. Furthermore, a functional Point-of-Sale (POS) system with internet access, a computer for PEAMDOTs ID registration, and a barcode scanner for senior citizens' transactions was required.

The study also included senior citizens who met the following criteria: they had to be 60 years old and above, possess a booklet or a senior citizen ID card, and be frequent customers of the specific pharmacy. Additionally, senior citizens had to be willing to enroll in the system.

Exclusion criteria

Participants were excluded from the study if they did not meet the specified criteria. Pharmacies located outside Koronadal City, South Cotabato, or those unwilling to integrate PEAMDOTs ID into their system were excluded. Pharmacies that were unable to provide medication discount offers to senior citizens with PEAMDOTs IDs, lacked internet access or a computer, or were unwilling to participate in interviews or questionnaires during the data collection phases were also excluded. Additionally, pharmacies without a functional POS system, internet access, and a barcode scanner for PEAMDOTs ID registration and transactions were not considered for the study. Senior citizens who did not have a booklet or senior citizen ID card, were not frequent customers of the specific pharmacy, or were unwilling to enroll in the system were also excluded from the study.

Sampling Technique

Participants were chosen using a purposive sample method to ensure that only individuals with firsthand knowledge of implementing the PEAMDOTs ID system are included. Purposive sampling is a form of non-probability sampling strategy whereby the researcher purposefully picks individuals of the more significant population according to preset criteria to gather complete insights from a particular group (Campbell et al., 2020). This type of sampling is helpful since it enables researchers to choose study subjects who will offer in-depth answers to research questions.

The study specifically targeted individuals who meet the following criteria: 1 pharmacist in each of 8 community pharmacies in Koronadal City, South Cotabato. Purposive sampling is a method in which the researcher selects from the population based on their subjective criteria. Respondents are pre-screened by in-depth interviews before providing the research instrument to ensure they are relevant to the study's aims by confirming they possess the exact qualities or experiences under research, such as utilizing the PEAMDOTs ID system within the aforementioned scenario.

Research Instrument

This study utilized the theories TAM, DIT, and ECT as guiding frameworks to investigate the intricate dynamics associated with the influence of the PEAMDOTs ID on the system performance and the level of satisfaction in community pharmacies and senior citizens in Koronadal City. To effectively capture data in alignment with these theoretical underpinnings, the primary research instruments employed are Likert scale-based, self-made, and validated survey questionnaires.

This instrument will be utilized to collect quantitative data from a broader participant base. It will consist of structured questions designed to quantitatively measure such as system performance and the level of satisfaction. The questionnaires will be crafted to be concise, clear, and easily comprehensible.

The Likert scale, integrated into the instrument, will play a crucial role in assessing participants' attitudes and perceptions. The scale's options, ranging from "Always" to "Never" and "Very Satisfied to "Very Dissatisfied" will be used to gauge participants' level of agreement with statements related to the system's ease of use, effectiveness, and confidence in confidentiality measures. The study aimed to collect data on participant attitudes, allowing for quantitative analysis of subjective experiences and perceptions.

Beyond expert validation, the researchers further ensured the validity of the survey instrument by conducting a pilot test with a pharmacist prior to the full-scale implementation. This pilot phase allowed the research team

to assess the clarity, relevance, and interpretability of the questionnaire items. Feedback from this pilot testing informed necessary revisions to enhance the instrument's comprehensibility and reliability. Moreover, descriptive statistical measures such as mean and standard deviation were employed to check for consistency in responses, thereby supporting the internal validity of the instrument. The purposive selection of participants—pharmacists and senior citizens with direct experience of the PEAMDOTs ID system—further contributed to the content validity of the data gathered.

This approach ensured that quantitative data is leveraged to gain a comprehensive understanding of the PEAMDOTs ID system's impact on community pharmacies.

Table 1. Mean Range Level Interpretation System Performance

Description	Range	Scale	Mean Level Interpretation
Always	4.5-5.0	4	Very High
Often	3.5-4.4	3	High
Sometimes	2.5-3.4	2	Moderate
Never	1.0-2.4	1	Low

Table 2. Mean Range Level Interpretation Level of Satisfaction

Description	Range	Scale	Mean Level Interpretation
Very Satisfied	4.00-3.26	4	Very High
Satisfied	2.51-3.25	3	High
Dissatisfied	1.75-2.50	2	Low
Very Dissatisfied	1.00-1.75	1	Very Low

Data Gathering Procedure

The study will be conducted in multiple phases to gather the needed data:

Phase 1: In this initial phase, the researchers developed and organized the data collection tools, including survey questionnaires and discussion guides. The said research instrument was validated through a professional statistician. Necessary ethical clearances and consent were obtained from the appropriate bodies and participants. Collaborations were formed with local pharmacies in South Cotabato to facilitate the smooth execution of the research process.

Phase 2: Before the primary collection of data, a pilot test of the data collection tools was conducted with a pharmacist. This step evaluated the questions' clarity, relevance, and understandability within the questionnaires and discussion guides. Insights from this initial test will inform adjustments to these tools.

Phase 3: In this phase, validated survey questionnaires were distributed to pharmacists in community pharmacies to gather quantitative data regarding their experiences with the PEAMDOTs ID system. The focus was gathering information about system performance, satisfaction, and perception.

Phase 4: Concurrently with data collection, the research team conducted a small-scale field test of the PEAMDOTs ID system in the selected community pharmacies. This phase seeks to comprehend the practical implementation and integration of the system into routine pharmacy operations.

Phase 5: After the initial implementation of the PEAMDOTs ID system, a post-test was conducted to assess its effectiveness and identify any areas for improvement. This phase involved re-administering the survey questionnaires to the pharmacists.

Phase 6: Phases 3 and 4 have been completed, interpretation of gathered data will commence in a thorough analysis to discern patterns, relationships, and insights. This phase is crucial in understanding the assessment of the PEAMDOTs ID system within the community pharmacies in South Cotabato.

Figure 5. Schematic Diagram of Data Gathering Procedure
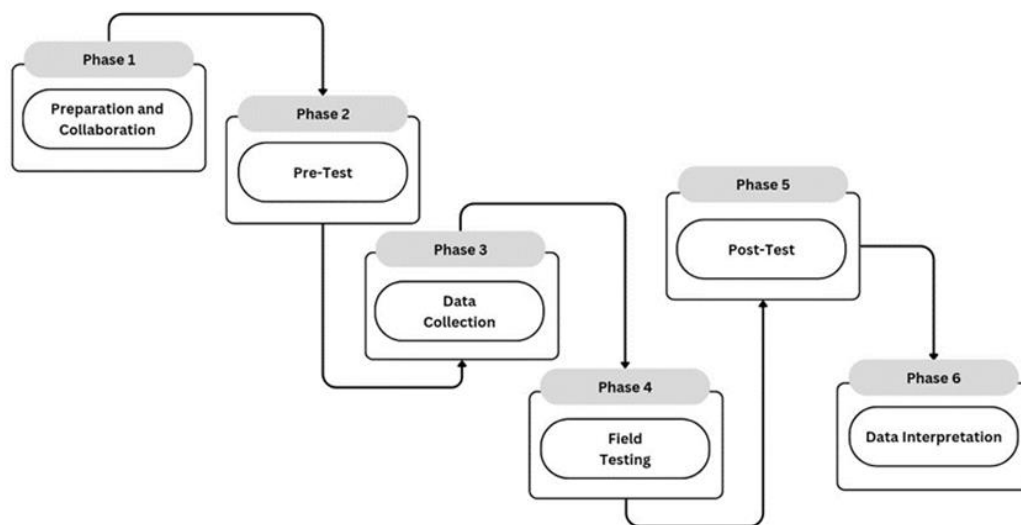
Data will be primarily sourced directly from pharmacists who have interacted with the PEAMDOTs ID system in the pharmacies of South Cotabato. This approach ensures that the information obtained is based on direct experiences, views, and attitudes concerning the factors associated with the integrated system. The conducted questionnaires will be the principal channels for acquiring and recording this essential data.

Statistical Treatment

This study utilized the chi-square test as the statistical method to determine if there was a significant relationship between two categorical variables. In this case, the categorical variables were the level of performance of PEAMDOTs and the level of satisfaction among senior citizens with the ID system integration. The chi-square test assessed whether there was a significant association between these variables.

If the null hypothesis was rejected, it suggested that there was a significant relationship between the level of performance of PEAMDOTs and the satisfaction of senior citizens with the ID system integration. This analysis aimed to provide insights into whether the perceived level of performance of PEAMDOTs was associated with the satisfaction of senior citizens in the integrated ID system. It served as a statistical assessment to determine if the level of performance of PEAMDOTs impacted the satisfaction levels of senior citizens within the context of the ID system integration.

By using the chi-square test, the study statistically evaluated the relationship between the performance of PEAMDOTs and the satisfaction of senior citizens, providing evidence to support or refute the hypothesis that these variables were related. This approach helped to better understand the effectiveness of the ID system integration and its influence on senior citizen satisfaction.

Table 3. Statistical Method

Test Statistic	Degree of Freedom (df)	Critical Value	p-Value	Decision Rule	Conclusion
X^2 value	(number of categories – 1)	From chi-square table at α level	Computed from test	If X^2 value > critical value, reject H_o	If p-value <α, reject H_o

This study also leveraged the mean value as a statistical tool to analyze and interpret the collected data. The mean serves as a crucial measure of central tendency, providing a succinct summary of the dataset of PEAMDOTs to analyze the system performance and satisfaction among senior citizens. The following four-point Likert scale questions were used to determine the level of system performance of the PEAMDOTs ID system in terms of scanning speed, data accuracy, efficiency management, user-friendliness, and confidentiality measures.

Also, the following four-point Likert scale questions were used to determine the level of satisfaction among senior citizens. To gauge the results of the quantitative problem, statistical indicators such as mean and standard deviation were employed. Table 2.0 and 3.0 describe the level of interpretation for the mean value from Manyage et.al. (2015).

Ethical Considerations

This research endeavored to uphold the highest ethical standards in accordance with the core values of St. Alexius College, as outlined in the Belmont Report of 1979. These values encompassed respect for human beings, beneficence, and justice. The primary aim encompasses not only the acquisition of knowledge that is advantageous to humanity but also the guarantee of safeguarding and well-being for all individuals engaged in the research.

Handling of Participant Withdrawals of Termination

If a participant decided to withdraw or terminate their participation, the researchers guaranteed to handle the situation with sensitivity and respect. It is crucial to recognize and respect participants' autonomy in making decisions that were in their best interests.

Participants were assured that their decision to withdraw will have no negative consequences or prejudice against them. While researchers may inquire about the reasons for withdrawal in order to better understand and improve the study conditions, participants will never be coerced, put under undue pressure, or persuaded to change their minds. All data collected from participants who choose to withdraw will be treated confidentially and in accordance with the study's ethical guidelines.

Compensations

This study acknowledged the significant contributions made by its participants in terms of their time and insights. However, it is important to clarify that no financial compensation will be offered to them for their participation. However, their significant contribution will serve a more extensive objective. The expectation is that participants possess a comprehensive understanding and genuine appreciation for the enduring consequences and societal advantages that can arise from their involvement.

The research, carried out under the careful guidance of the Research Advisers, will strictly adhere to the principles of safeguarding participants' safety, well-being, and rights. This research adheres to the subsequent ethical considerations:

1. Informed Consent – Each participant will be provided detailed information about the PEAMDOTs ID system, its objectives, and the nature of the study to the participants. This includes explaining how their data will be used, the duration of their involvement, and the specific role they play in the research. All participants will be given clear, understandable consent forms, and the opportunity to ask questions.

1.1 Reasons for Withdrawal or Termination - Participation in this study is completely optional, and people can quit at any time. It is understood that individuals may withdraw from the study due to personal reasons, health issues, or other unforeseen circumstances. Reasons could include dissatisfaction with the study's procedures, time constraints, personal emergencies, or simply a change of heart. Regardless of the reason, the researchers will document all withdrawals or terminations while maintaining participant confidentiality. Any participant who chooses to discontinue their participation will be treated with the utmost respect and understanding, with no negative consequences or penalties.

2. Risks and Benefits – Prior to commencing the data collection process, researchers will clearly communicate any potential risks involved with the PEAMDOTs ID system, such as data breaches or privacy concerns, as well as the benefits, like enhanced healthcare access.

The researchers recognize that participants may encounter certain risks and benefits while participating in this study. Given the sensitive nature of healthcare data, the potential for privacy concerns is the most serious of the risks. Furthermore, when sharing personal experiences, participants may feel uncomfortable or distressed. One of the most significant advantages of participation, on the other hand, is the opportunity to contribute to the improvement of healthcare services for senior citizens. The broader community may benefit from optimized pharmacy practices if the impact of the PEAMDOTs ID system on customer service, satisfaction, and convenience is understood. All potential risks and benefits will be communicated transparently during the informed consent process to ensure participants are fully informed and can make an informed decision about their participation.

Table 4. Detailed Analysis of the Risks and Benefits of the PEAMDOTs ID System

Aspect	Benefits of the PEAMDOTs ID	Risks of the PEAMDOTs ID
Efficiency	Quick Service	Initial Delays
	The PEAMDOTs ID system may streamline pharmacy processes, leading to faster service and less waiting time for senior citizens.	There might be technical glitches or learning curves associated with new systems that could initially slow down processes.
Data Accuracy	Manual Error Reduction	System Malfunctions
	Automated systems like PEAMDOTs ID can reduce manual errors, ensuring that prescriptions and medical records are accurate.	System errors or malfunctions could lead to inaccurate data input or retrieval.
Accessibility	Easy Access	Tech-Dependency
	The system could make it easier for senior citizens to access their medical records and understand their prescription details.	Over-reliance on the system might exclude those who are not tech-savvy or do not have the PEAMDOTs ID.
Privacy	Enhanced Security	Data Breaches
	Centralized systems can have enhanced security features, potentially safeguarding users' medical data better than paper records.	There is a risk of data breaches, hacks, or unauthorized access, which can compromise patient confidentiality.
Engagement	Increased Involvement	Interface Complexity
	By involving senior citizens in the PEAMDOTs ID system, there's a chance to increase their engagement and understanding of their health regimen.	Overwhelming or confusing interfaces could deter senior citizens from engaging or might lead to misinterpretations.
Cost-Effectiveness	Long-Term Discounts	Set-up Costs
	The PEAMDOTs ID system may provide special discount offers for senior citizens, making healthcare products and services more affordable for them.	Initial setup, maintenance, and potential troubleshooting or system updates might entail significant costs.

3. Voluntary Participation – It is of utmost importance that each participant willingly and voluntarily chooses to partake in the study, without any external pressure or coercion. Participants maintain the choice to discontinue their involvement in the study at any time, without incurring any negative consequences.

4. Privacy and Confidentiality – Strict protocols will be in place to ensure the anonymity and confidentiality of participant data. This includes secure storage of data, coding of personal identifiers, and restricted access to sensitive information.

5. Compliance with Legal and Institutional Protocols – The present study will rigorously adhere to the Data Privacy Act of the Philippines (Republic Act No. privacy and protecting the data of the participants.

RESULTS AND DISCUSSIONS

Level of the Peamdots Id System Performance

The PEAMDOTs ID system was designed to facilitate and streamline medication discount transactions in pharmacies, particularly for senior citizens. This system's performance was evaluated across several key areas, including scanning speed, data accuracy, efficiency management, user-friendliness, and confidentiality measures. Overall results are shown in table 5.

Table 5. Mean level of the PEAMDOTS ID system performance in terms of Scanning Speed

System Performance	Mean	SD	Description
Scanning Speed			
PEAMDOTs ID system efficiently scans patient IDs in less than five seconds.	3.88	0.35	Very High
The PEAMDOTs ID system significantly simplifies and enhances the accuracy of customers' medication discount transactions.	3.63	0.52	Very High
PEAMDOTs ID system is convenient to use for scanning.	3.75	0.46	Very High
PEAMDOTs ID system scanning feature remains consistent during peak pharmacy hours.	3.25	0.71	High
PEAMDOTs ID system supports bulk scanning without compromising the speed or accuracy.	3.38	0.52	High
Overall Mean	**3.58**	**0.38**	**Very high**

In the realm of pharmacy operations, expediting medication access for patients is paramount. This translates to improved efficiency and ultimately, better patient care. Traditionally, this involved manually entering medication details, a cumbersome and error-prone process documented by Johnson et al. (2019). The PEAMDOTs ID system addresses this challenge head-on by excelling in scanning speed.

The system boosted an impressive mean score of 3.88 for scanning speed, with a standard deviation of 0.35 indicating remarkable consistency. This translates to efficiently scanning patient IDs in under five seconds on average. This significant improvement streamlines transactions at the pharmacy, reducing waiting times for patients. Faster scanning also minimizes errors inherent in manual data entry, enhancing overall accuracy.

Furthermore, users commended the system's consistent performance even during peak hours, demonstrating its ability to handle high patient volumes without sacrificing speed. This reliability is further underscored by the system's ability to support bulk scanning efficiently, maintaining both speed and accuracy even when processing multiple IDs at once. Overall, the PEAMDOTs ID system's exceptional scanning speed offers a

clear advantage over traditional methods, contributing significantly to improved efficiency and patient care in pharmacies.

Table 6. Mean level of the PEAMDOTS ID system performance in terms of Data Accuracy

System Performance	Mean	SD	Description
Data Accuracy			
PEAMDOTs ID can provide accurate senior discount + 12% VAT exemption to the customers.	3.75	0.46	Very High
The system can maintain up-to-date data regarding patient medicine and discounts.	3.38	0.74	High
The PEAMDOTs data provides valuable insights into medication discounts for senior citizens, aiding in their understanding of available benefits.	3.63	0.52	Very High
The PEAMDOTs ID system can effectively prevent data mismatches or errors in patient discount eligibility.	3.38	0.74	High
PEAMDOTs ID ensures the confidentiality of discount information in preventing unauthorized access.	4.00	0.00	Very High
Overall mean	**3.63**	**0.39**	**Very High**

Accuracy in healthcare systems, particularly concerning patient safety and medication management, is crucial to preventing errors and ensure efficient operations (Franklin, 2009). The PEAMDOTs ID system exemplifies this commitment with its robust performance in data accuracy.

With a mean score of 3.75 and a standard deviation of 0.46, the system excels in providing accurate senior discounts and VAT exemptions to customers. It maintains current information on medication discounts, offering valuable insights that benefit senior citizens by navigating available benefits, as reflected in its high mean score of 3.63 with a SD of 0.52. Importantly, the PEAMDOTs ID system demonstrates effectiveness in preventing data mismatches or errors in patient discount eligibility, contributing to its high reliability score of 3.38 (SD: 0.74). Furthermore, its stringent confidentiality measures, earning a perfect score of 4.00, ensure the security of discount information by preventing unauthorized access. Overall, the PEAMDOTs ID system's performance in terms of data accuracy is highly commendable, underscored by its consistent high ratings across various metrics. This reliability not only enhances operational efficiency but also fosters patient trust by safeguarding their sensitive information.

Table 7. Mean level of the PEAMDOTS ID system performance in terms of Efficiency Management

System Performance	Mean	SD	Description
Efficiency Management			
The PEAMDOTs ID system simplified the medication discount process, resulting in less time spent at the pharmacy.	3.50	0.76	Very High
PEAMDOTs ID system enhanced the overall flow of medication discount transactions for senior citizens leading to smoother and quicker processing.	3.75	0.46	Very High
PEAMDOTs ID system has reduced the need for manual data entry by community pharmacists.	3.63	0.52	Very High
PEAMDOTs ID system responsiveness to queries about medication discounts is satisfactory.	3.63	0.52	Very High
PEAMDOTs ID system allows for real-time tracking of medication discount usage and availability.	3.75	0.46	Very High
Overall Mean	**3.65**	**0.49**	**Very High**

Efficient management within healthcare systems, as highlighted by Gremyr et al. (2021), played a pivotal role in improving service quality, reducing costs, and ultimately enhancing user satisfaction. The PEAMDOTs ID system exemplified effective efficiency management, as evidenced by its robust performance across various metrics. With a mean score of 3.65 and a standard deviation of 0.49, the PEAMDOTs ID system excels in several key areas related to efficiency management. It simplifies the medication discount process, significantly reducing the time customers spend at the pharmacy (mean: 3.50, SD: 0.76). This streamlined approach not only improves customer satisfaction but also optimizes workflow efficiency. The system enhances the flow of medication discount transactions for senior citizens, facilitating smoother and quicker processing (mean: 3.75, SD: 0.46). By minimizing the need for manual data entry by community pharmacists (mean: 3.63, SD: 0.52), PEAMDOTs ID further streamlines operations, reducing the potential for errors and freeing up valuable time for healthcare professionals to focus on patient care.

Additionally, its responsiveness in handling queries about medication discounts (mean: 3.63, SD: 0.52) and real-time tracking of discount usage and availability (mean: 3.75, SD: 0.46) underscores its commitment to efficiency and customer service.

Overall, the PEAMDOTs ID system's strong performance in efficiency management not only reflects its ability to optimize processes but also demonstrates its dedication to enhancing the overall healthcare experience for both customers and healthcare providers. By leveraging technology to streamline operations and improve service delivery, PEAMDOTs ID sets a high standard for efficiency in healthcare management systems.

Table 8. Mean level of the PEAMDOTS ID system performance in terms of User-Friendliness

System Performance	Mean	SD	Description
User-Friendliness			
PEAMDOTs ID is easy to navigate/ operate when in use.	3.50	0.76	Very High
PEAMDOTs ID can provide a user-friendly experience.	3.88	0.35	Very High
Understanding the PEAMDOTs ID, especially regarding medication discounts, is clear and accessible.	3.75	0.46	Very High
The PEAMDOTs ID system is easy to troubleshoot even without IT support.	3.25	0.46	High
PEAMDOTs ID system provides adequate IT support and guidance when encountering difficulties.	3.38	0.52	High
Overall Mean	**3.55**	**0.35**	**Very High**

User-friendliness was a cornerstone of effective system design, profoundly influencing user experience, operational efficiency, and overall satisfaction (Folstad, 2017). The PEAMDOTs ID system exemplifies this principle with its strong performance in user-friendliness, as reflected in its comprehensive ratings across various usability metrics. With an impressive mean score of 3.55 and a low standard deviation of 0.35, the PEAMDOTs ID system is highly regarded for its ease of navigation and operation (mean: 3.50, SD: 0.76). This characteristic not only simplifies the use of the system but also enhances user productivity by reducing the learning curve associated with new technologies.

The system provided a user-friendly experience overall (mean: 3.88, SD: 0.35), ensuring that interacting with PEAMDOTs ID is intuitive and accessible. This attribute is further reinforced by its clear and understandable

interface concerning medication discounts (mean: 3.75, SD: 0.46), which facilitated seamless interactions for both customers and healthcare professionals.

In terms of troubleshooting, PEAMDOTs ID maintained a solid performance (mean: 3.25, SD: 0.46), indicating that users can resolve issues efficiently even without dedicated IT support. Additionally, the availability of adequate IT support and guidance (mean: 3.38, SD: 0.52) underscored the system's commitment to ensuring a smooth user experience and operational continuity. Overall, the high ratings in user-friendliness demonstrated that the PEAMDOTs ID system not only meets but exceeds expectations in usability. By incorporating user feedback and prioritizing intuitive design, PEAMDOTs ID sets a benchmark for user-friendly healthcare management systems, enhancing both user satisfaction and operational efficiency in healthcare settings.

Table 9. Mean level of the PEAMDOTS ID system performance in terms of Confidentiality Measures

System Performance	Mean	SD	Description
Confidentiality Measures			
PEAMDOTs ID system can only be accessed in a secure network.	3.75	0.46	Very High
PEAMDOTs keeps patient information safe, making sure it stays private and confidential.	3.88	0.35	Very High
PEAMDOTs ID provides access to patient information to authorized personnel only.	3.75	0.46	Very High
PEAMDOTs ID system prevents the transfer of personal information.	3.63	0.52	Very High
PEAMDOTs ID system has a secure firewall that protects patient information from hacking.	3.63	0.52	Very High
Overall Mean	**3.73**	**0.37**	**Very High**

Smith (2019) stated that confidentiality measures are crucial in any system, especially those dealing with sensitive information. They ensured that only authorized individuals or entities have access to certain data, protecting it from unauthorized access, disclosure, or modification.

Regarding confidentiality measures, the system demonstrated a high level of security, with a mean score of 3.73 and an SD of 0.37. It ensures that patient information is kept safe, preventing unauthorized access and the transfer of personal information. The secure firewall and access control mechanisms maintain a high level of security, providing peace of mind to users and pharmacy staff.

Overall, the PEAMDOTs ID system demonstrated a very high level of performance across all evaluated categories, with mean scores consistently above 3.25. This system's strengths in scanning speed, data accuracy, efficiency management, user-friendliness, and confidentiality measures make it an effective solution for managing medication discount transactions in pharmacies.

Level of Satisfaction

The PEAMDOTs ID system has been designed to facilitate medication discounts for senior citizens, aiming to simplify the administrative processes and reduce waiting times. The following data showed the level of satisfaction among senior citizens in utilizing this system, focusing on several key factors such as simplicity, convenience, and security. The overall results of the survey are shown in table 10.

Table 10. Mean Level of Satisfaction among senior citizens in the utilization of PEAMDOTS ID system

Level of Satisfaction	Mean	SD	Description
Implementing the PEAMDOTs ID has simplified the process of providing medicine discounts.	3.58	0.55	Very High
The PEAMDOTs ID has simplified the administrative tasks of providing medicine discounts.	3.53	0.58	Very High
The PEAMDOTs ID has made it easier to process and apply medicine discounts.	3.51	0.58	Very High
I don't need to worry about always bringing my ID to purchase medicine.	3.53	0.53	Very High
The availability of medication discounts through the PEAMDOTs ID system has positively impacted my well-being.	3.46	0.59	High
The PEAMDOTs ID has significantly reduced concerns about proving my eligibility for discounts.	3.45	0.59	High
The PEAMDOTs ID has significantly reduced my waiting time during transactions.	3.39	0.63	High
Obtaining the PEAMDOTs ID are convenient and user-friendly.	3.37	0.65	High
The PEAMDOTs ID is more secure regarding my identity and personal information.	3.43	0.61	High
The PEAMDOTs ID has made it easier for me to avail discounts.	3.72	0.48	Very High
Overall Mean	**3.47**	**0.32**	**High**

Satisfaction is a psychological state or feeling generated from the customer experience of his/her assessment of the experience (Oliver, 1980). In the field of information technology, it was interpreted that satisfaction refers to the results of the user experience in using information technology or information systems. Regarding the mean level of satisfaction among senior citizens in using the PEAMDOTs ID system, it is generally high, with an overall mean of 3.47 and a standard deviation (SD) of 0.32. Implementing this system has simplified the process of providing medicine discounts, with a mean score of 3.58 and an SD of 0.55, indicating a very high level of satisfaction. This simplification extends to administrative tasks, where the system has reduced the complexity of providing medicine discounts, scoring 3.53 with an SD of 0.58.

Senior citizens find the PEAMDOTs ID system beneficial for processing and applying medicine discounts, with a mean score of 3.51 and an SD of 0.58, suggesting a very high satisfaction rate. A significant advantage is that users no longer need to carry their ID to purchase medicine, earning a score of 3.53 with an SD of 0.53. Additionally, the availability of medication discounts through this system has positively impacted users' well-being, with a mean score of 3.46 and an SD of 0.59, indicating a high level of satisfaction.

The PEAMDOTs ID system has reduced concerns about proving eligibility for discounts, scoring 3.45 with an SD of 0.59, and significantly reduced waiting times during transactions, scoring 3.39 with an SD of 0.63. Obtaining the PEAMDOTs ID is convenient and user-friendly, with a high satisfaction rating of 3.37 and an SD of 0.65. Security also plays a role in the high satisfaction rating, with the system providing enhanced security for identity and personal information, earning a mean score of 3.43 and an SD of 0.61.

The system's effectiveness in making it easier to avail discounts is one of its most appreciated features, with a mean score of 3.72 and an SD of 0.48, resulting in a very high satisfaction rating. Overall, the data indicates that senior citizens find the PEAMDOTs ID system a convenient, secure, and user-friendly solution for managing medication discounts, leading to reduced waiting times and simplified administrative tasks.

CONCLUSION

The Integration of Patient's Easy Access for Medication Discount Offers and Transactions ID (PEAMDOTs ID) for Senior Citizens is a user-friendly system designed to streamline the process of obtaining medication discounts and managing transactions for elderly patients. This study explored the challenges seniors face in accessing these discounts and demonstrated how the PEAMDOTs ID system effectively addresses these issues. By consolidating discount offers and enabling seamless transactions, the system simplified processes, alleviated financial strain, and improved medication adherence. Participants reported high satisfaction with the system's ease of use and the comprehensive information it provides. The study concludes that the PEAMDOTs ID system significantly enhances the efficiency of accessing medication discounts, contributes to improved patient care, and supports the potential integration of advanced technologies such as artificial intelligence to further expand its benefits—ultimately improving the quality of life for senior citizens.

Although the study was conducted in Koronadal City, its findings have broader implications. The PEAMDOTs ID system presents a scalable framework that can be adapted by other cities and regions experiencing similar challenges in managing medication discounts and healthcare services for the elderly. By addressing common pain points such as discount validation, transaction processing, and system usability, this model offers a practical blueprint for nationwide implementation or integration into larger healthcare technology infrastructures.

Regarding survey reliability, the research instrument was carefully developed and validated through expert consultation and a pilot test prior to data collection. The use of a structured Likert-scale questionnaire enabled quantifiable measurement of key performance indicators. Furthermore, statistical analyses—including measures of central tendency, standard deviation, and chi-square testing—ensured consistent interpretation of results, reinforcing the internal consistency and reliability of the collected data.

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