


Implementation of agile methodology in developing insurance claim payment application at pharmacies

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Article Info	ABSTRACT
Keywords: Insurance Claim Payment, Application, Agile Methodology, Pharmacies.	Payment claim management in pharmacies is often conducted manually, which is susceptible to errors and less efficient. To address this challenge, a more structured and effective approach is needed. This research adopts the Agile approach in developing an insurance claim payment application in pharmacies. The Agile approach was chosen for its flexibility in adapting to user needs changes and enabling rapid iterations in application development. Implementing the application with the Agile approach resulted in a product that meets most of the specifications and user expectations, with features such as pharmacy system integration, quick claim reporting, timely payment notifications, and strong data security receiving positive feedback from users. However, user acceptance evaluation also identified some areas that require improvement, such as limited password reset features and less flexible notification options. This research makes a significant contribution to the development of insurance claim payment applications in pharmacies using the Agile approach. The results of this research provide insights into the effectiveness of the Agile approach in this context and lay the groundwork for further improvements and enhancements in the development of similar applications in the future.
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INTRODUCTION

In the context of the healthcare industry, both insurance and pharmacies play crucial roles in providing quality healthcare services to the public. Health insurance offers financial protection for individuals and families to access medical care without bearing the costs directly. On the other hand, pharmacies play a crucial role in providing medications and other healthcare services to the public, serving as the first point of access for patients seeking necessary healthcare (Andia et al., 2022; Johnson et al., 2024; Khan et al., 2023; Kumar & R.S., 2022; Pham et al., 2023; Phanudulkitti et al., 2023; Sujana et al., 2022; Tan et al., 2023; J. Wang & Conwell, 2022). However, in the context of insurance claim payments at pharmacies, there are often challenges that need to be addressed. The dominant manual process often becomes a source of issues, with high administrative complexity, including time-consuming data recording and complicated documentation management. This can lead to human errors, claim payment delays, and data inaccuracies, ultimately disrupting operational

efficiency and increasing frustration levels for all parties involved (Aljaber et al., 2023; Baumgartner et al., n.d.; E. Y. H. Chen et al., 2023; Coic et al., 2020).

Therefore, it is important to introduce solutions that can enhance efficiency and accuracy in the insurance claim payment process at pharmacies. Automation and the use of specialized applications can be effective solutions to address these challenges. By adopting applications supported by information technology, most administrative tasks can be automated, including recording processes, claim verification, and payments (H. C. Chen, 2019; Durand-Lasserve, 2022; Gao, 2022; Khan et al., 2023; H. Wang et al., 2023; X. Wang & Wang, 2022; Yamada & Ito, 2022). The main benefits of automation and application use in insurance claim payments at pharmacies are increased operational efficiency and data accuracy. Automation enables faster and more consistent processes, reducing the risk of human errors and claim payment delays. Additionally, applications can provide real-time tracking of claim status, allowing stakeholders to proactively address any emerging issues and provide more responsive service to insurance policyholders.

In facing these complex challenges, the use of Agile methodology in developing insurance claim payment applications at pharmacies offers a flexible and adaptive approach. Basic Agile principles, such as continuous communication, valuing individuals and interactions, and the ability to respond to change rather than following a predetermined plan, enable development teams to be more adaptive to needs and changes in application development (Almeida et al., 2022; Al-Saqqa et al., 2020; Bomström et al., 2023; Dingsøyr et al., 2019; Dingsøyr et al., 2012; Najihi et al., 2022; Rindell et al., 2021; Santos et al., n.d.; Serrador & Pinto, 2015; Shrivastava & Rathod, 2014). The advantages of Agile methodology in the context of developing insurance claim payment applications include its ability to facilitate close collaboration between development teams and stakeholders, flexibility to adjust priorities and features based on received feedback, and the ability to accelerate development cycles through short iterations.

However, it must be acknowledged that Agile methodology also has some drawbacks, especially in the context of developing applications that require strict compliance with rules and regulations, such as insurance claim payment applications. Some potential drawbacks may include a lack of clear long-term planning, the risk of losing visibility into the overall project, and difficulty in handling significant changes in project needs or requirements (Hasan et al., 2013; Meiliana et al., 2023; Michalides et al., 2023; Mishra & Alzoubi, 2023; Tøndel et al., 2022). Nevertheless, considering these advantages and disadvantages and taking steps to mitigate associated risks, the implementation of Agile methodology in developing insurance claim payment applications at pharmacies can provide significant benefits in improving responsiveness, quality, and stakeholder satisfaction.

In the context of developing insurance claim payment applications at pharmacies using the Agile approach, this research will focus on evaluating the effectiveness of implementing Agile methodology in addressing challenges in the insurance claim payment process at pharmacies. This research aims to analyze the efficiency and accuracy of application development with the Agile approach, as well as identify key factors influencing

the success of Agile implementation in this context. By understanding the critical role of the insurance and pharmacy industries in healthcare services, as well as the challenges faced in the insurance claim payment process at pharmacies, this research is expected to make a significant contribution to practitioners and academics in this field. By applying Agile methodology in developing insurance claim payment applications at pharmacies, it is hoped that benefits such as improved operational efficiency, higher data accuracy, and responsiveness to change can be achieved, ultimately having a positive impact on improving the insurance claim payment process at pharmacies and enhancing overall healthcare service quality.

METHODS

In this study, the effectiveness of implementing Agile methodology in developing an insurance claim payment application at pharmacies is evaluated through a series of systematic stages. User acceptance analysis plays a crucial role in understanding user needs and preferences. Furthermore, application development using the Agile approach involves sprint planning, iterative development, and open communication between the development team and stakeholders. Functional evaluation and user acceptance analysis highlight the importance of ensuring that the application meets expected functional standards and is well-received by users. The results of this research are expected to provide valuable insights for the insurance and pharmacy industries in enhancing the effectiveness of application development and overall healthcare services.



Figure 1. Research Stages

User Acceptance Analysis

This stage begins with the identification of key stakeholders, including pharmacists, administrative staff, and insurance policyholders. Data collection is then conducted through interviews, surveys, or literature studies to understand user needs and preferences related to the insurance claim payment application at pharmacies. The collected data is then analyzed to identify the primary user needs and factors that will influence the acceptance and adoption of the application.

Application Development using Agile Methodology

After user needs are identified, the next activity is application development using the Agile approach. The application development team conducts sprint planning, which involves setting sprint goals, identifying features to be developed, and designing development iterations. During the sprint, the team collaboratively works to develop, test, and demonstrate features to stakeholders. Open and regular communication between the development team and stakeholders is key in this stage.

User Acceptance Evaluation

The final stage involves the evaluation of the functional application that has been developed and the analysis of user acceptance of it. The team conducts functional testing to ensure that the application meets the specified requirements and functions properly. Meanwhile, users are invited to use the application and provide their feedback. Data from functional testing and user feedback is then analyzed to evaluate the performance of the application and analyze the level of user acceptance towards it.

RESULTS AND DISCUSSION

User Requirements

The results of the User Acceptance Analysis stage indicate that the key stakeholders identified include pharmacists, administrative staff, and insurance policyholders. Through data collection conducted via interviews, surveys, and literature studies, a deep understanding of user needs and preferences related to the insurance claim payment application at pharmacies is obtained. Analysis of this data yields identification of the users' primary needs and factors that may potentially influence the acceptance and adoption of the application. Thus, the results of this stage provide a strong foundation for designing and developing an application that is responsive to user needs and has a high level of acceptance in the pharmacy environment.

Table 1. User Requirements

Stakeholders	Primary Needs	Factors Affecting Acceptance
Pharmacists	Integration with pharmacy systems, efficient claim reporting	Application complexity, training requirements, adaptation time needed
Administrative staff	User-friendliness, ability to track claim status in real-time	Intuitive interface, technical support, system reliability
Insurance policyholders	Accessibility of claim information, prompt claim payment notifications	Data security, availability of mobile features, ease of access to claim information

Table 1 illustrates that each stakeholder has different primary needs related to the insurance claim payment application at pharmacies. Pharmacists prioritize application integration with pharmacy systems and efficient claim reporting to ensure smooth operational activities. However, they also recognize that application complexity and adaptation time could be barriers to acceptance. On the other hand, administrative staff

seek an easy-to-use application that can track claim status in real-time to enhance administrative efficiency. However, they also emphasize the importance of an intuitive interface and system reliability for smooth application usage. Insurance policyholders, meanwhile, desire easy accessibility to claim information and prompt claim payment notifications. However, they are also concerned about data security and the ease of accessing claim information via mobile devices. By understanding the needs and concerns of each stakeholder, application developers can design solutions that accommodate these various needs and enhance application acceptance by users.

Application Development

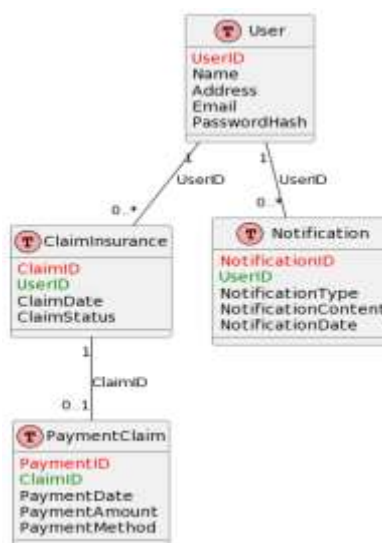
The results of the Application Development stage using Agile Methodology indicate that after user needs are identified, the application development team executes a series of activities based on the Agile approach. This includes sprint planning, where the team sets sprint goals, identifies features to be developed, and designs development iterations. During the sprint, the team collaboratively works to develop, test, and demonstrate features to stakeholders. Open and regular communication between the development team and stakeholders is key to ensuring the application's alignment with user needs and expectations. With this approach, the development team can efficiently produce application iterations that are responsive and relevant to user needs, as well as promptly and effectively respond to changes in requirements or feedback from stakeholders.

Table 2. Features

Features	Functions
Pharmacy System Integration	This feature enables the integration of insurance claim data with existing pharmacy systems. With this integration, users can access and manage insurance claims directly from the pharmacy system, enhancing efficiency and consistency in data management.
Fast Claim Reporting	This feature allows users to quickly report insurance claims to the insurance provider. The fast reporting process helps reduce the time needed to file claims, improves administrative efficiency, and expedites the claims payment process.
Real-time Claim Status	This feature enables users to track their claim status in real-time. Thus, users can monitor the progress of their claims more effectively, obtain accurate and up-to-date information about claim status, and reduce uncertainty.
Intuitive User Interface	This feature provides a user-friendly and intuitive user interface. With an intuitive interface, users from various backgrounds can easily use the application

Features	Functions
Payment Notifications	without difficulty, enhancing user satisfaction and effectiveness of application usage. This feature provides direct notifications to users whenever insurance claim payments have been processed and paid. These notifications help users stay up-to-date on their claim status, providing transparency and enhancing user trust in the claims payment process.
Data Security	This feature provides a high level of security to protect users' personal and sensitive data. With strong data security, users can feel confident in using the application, while insurance companies can ensure that users' sensitive information is well protected.

The insurance claim payment application features presented in Table 2 at pharmacies offer effective solutions in managing the claim process efficiently and transparently. Integration with pharmacy systems enables easy and integrated access to claim data, while fast claim reporting enhances administrative efficiency. Real-time claim status provides better visibility to users, while the intuitive user interface enhances the overall user experience. Payment notifications provide users with certainty about their claim status, while high data security ensures confidentiality. Thus, these features collectively contribute to improving efficiency, transparency, and user satisfaction in the insurance claim payment process.



Gambar 2. ER Diagram

The ER diagram in Figure 2 illustrates the basic data structure of an application designed to manage insurance claims within a pharmacy environment. The diagram consists of four main entities: User, InsuranceClaim, ClaimPayment, and Notification. The User entity represents individuals interacting with the application, such as pharmacists, administrators, or insurance policyholders, and includes attributes such as UserID, Name, Address, Email, and Hashed Password. Each user can submit multiple insurance claims, represented by the InsuranceClaim entity, which includes attributes such as ClaimID, ClaimDate, and ClaimStatus. Additionally, users can receive notifications regarding their claims, as reflected in the Notification entity, which includes details such as NotificationType, NotificationContent, and NotificationDate. Furthermore, payments made for insurance claims are recorded in the ClaimPayment entity, which has attributes such as PaymentID, PaymentDate, PaymentAmount, and PaymentMethod. The relationships between these entities are clearly defined, facilitating efficient data retrieval and manipulation. Overall, the ER diagram provides a comprehensive overview of the application's data model, enabling effective management of insurance claims within the pharmacy environment.

User Acceptance Evaluation

The results of the User Acceptance Evaluation stage involve two main activities: functional testing of the application and analysis of user acceptance. The team conducts functional testing to ensure that the application meets the specified requirements and functions properly according to user needs. Concurrently, users are invited to use the application and provide feedback on their user experience. Data from functional testing and user feedback are then comprehensively analyzed to evaluate the application's performance and analyze the level of user acceptance. This analysis provides a deep understanding of how well the application meets user expectations and allows for the identification of areas that require further improvement or refinement.

Table 3. Functional Testing

Application Features	Functional Testing	Functional Testing Results	Desc.
Pharmacy System Integration	Connecting the application with the pharmacy system	Successful	The pharmacy system can be connected to the application, and insurance claim data can be accessed and managed through the application interface.
Rapid Claim Reporting	Reporting insurance claims quickly	Successful	Users can report insurance claims quickly and easily through the reporting feature available in the application.
Real-time Claim Status	Tracking claim status in real-time	Successful	Users can track the status of insurance claims in real-time through the application, providing transparency and convenience in

Application Features	Functional Testing	Functional Testing Results	Desc.
			monitoring the progress of their claims.
Intuitive User Interface	Providing an easily understandable interface	Successful	The application interface is well-designed, easy to understand, and user-friendly, allowing users from various backgrounds to use the application comfortably.
Payment Notifications	Providing notifications for each claim payment	Successful	Users receive timely notifications whenever insurance claim payments are processed and paid, increasing their engagement and understanding.
Data Security	Ensuring high-level security measures	Successful	A robust security system has been implemented to protect users' personal and sensitive data in the application, ensuring user trust and privacy are maintained.

In Table 3, testing all application features highlights the results of functional evaluation, including pharmacy system integration, fast claim reporting, real-time claim status, intuitive user interface, payment notifications, and data security. Overall, these tests indicate that the application has successfully met most of the specified requirements. Pharmacy system integration has proven successful, allowing access and management of insurance claim data through the application interface. Fast claim reporting and real-time claim status features provide users with efficiency in reporting and tracking claim progress. The intuitive user interface enhances user experience with easily understandable and user-friendly design. Timely payment notifications provide transparency and necessary user engagement during the claim payment process. Lastly, strong data security ensures users' sensitive information is well protected. However, there are some areas that may require further improvement, such as enhancing the password reset feature and options for customizing notification preferences.

The results of user acceptance evaluation indicate that the application has received positive feedback from the majority of users. Overall, users evaluate the application interface as clean and easy to use. However, there are some areas that require further attention, such as the limited password reset feature and confusing claim process. Users also desire options to customize notification preferences to better suit their needs. Nevertheless, other features such as fast claim reporting, timely payment notifications, and strong data security received positive ratings from users. This evaluation provides a deeper understanding of user preferences and expectations for the application, serving as a foundation for further improvement and enhancement.

CONCLUSION

The development of the insurance claim payment application in pharmacies using the Agile approach has resulted in a product that meets most of the specifications and user expectations. Features such as pharmacy system integration, fast claim reporting, real-time claim status, intuitive user interface, payment notifications, and data security have been successfully implemented and positively evaluated by users. However, the user acceptance evaluation also revealed some areas that require improvement, such as the limited password reset feature and inflexible notification options. Thus, this research reaffirms the importance of the Agile approach in application development to adapt to changing user needs and ensure continuous improvement based on received feedback. Additionally, the findings of this study can be a valuable contribution to the development of similar applications in the future, as well as strengthening understanding of Agile methodology application in the insurance and pharmacy application development context.

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