IPRPD
International Journal of Business & Management Studies
ISSN 2694-1430 (Print), 2694-1449 (Online)
Volume 06; Issue no 08: August, 2025
DOI: 10.56734/ijbms.v6n8a8

KEY SUCCESS FACTORS FOR IMPLEMENTING INSURANCE CLAIMS SYSTEMS TO OFFSET INPATIENT MEDICAL EXPENSES IN HOSPITALS

Shih-Hao Yang[1]

[1]*Department of Marketing and Logistics Management, Taipei City University of Science and Technology, Taipei, Taiwan*

Abstract

Implementing insurance claims systems to offset inpatient medical expenses can help hospitals reduce bad debt risks, streamline discharge and underwriting processes, and mitigate insurance fraud. This study applied the fuzzy analytic hierarchy process (FAHP) to systematically identify the key success factors for hospitals to implement insurance claims systems to offset inpatient medical expenses. The respondents comprised supervisory, managerial, and technical personnel from both hospitals and insurance companies in Taiwan. The results indicate that System Quality and Functionality is the most critical criterion, with System and Equipment Stability, Data Security and Confidentiality, and Real-Time and Accurate Data identified as the top three sub-criteria. The group comparison results reveal that hospitals emphasize internal organizational management to ensure smooth system integration, while insurance companies focus on hospital staff's operational familiarity and system functionality to support efficient claims processing and scalability. The findings provide practical references for system implementation planning and for enhancing collaboration between hospitals and insurance companies.

Keywords

Insurance Claims Systems, Inpatient Medical Expenses, Key Success Factors, System Implementation, Fuzzy Analytic Hierarchy Process (FAHP)

1. Introduction

As the medical environment becomes increasingly complex, the implementation of hospital information technology (HIT) to improve the quality of medical operations has become a critical priority for hospitals. The adoption of HIT not only supports the delivery of medical services but also ensures patient safety and enhances healthcare quality (Mars and Scott, 2010). Consequently, HIT has become a key driver in improving the operational performance and overall competitiveness of healthcare institutions (Porter and Millar, 1985).

In Taiwan, both the number of medical insurance claims and the total payout amounts have shown consistent annual growth. According to statistics from the Taiwan Insurance Institute (2025), as illustrated in Figure 1, the number of medical insurance claims increased from 10,173.5 thousand cases in 2016 to 15,881.8 thousand cases in 2024, with a compound annual growth rate (CAGR) of 5.7%. The total payout amount rose from 3,689.3 million USD in 2016 to 7,409.2 million USD in 2024, reflecting a CAGR of 9.1%. Additionally, the average payout per medical insurance claim increased from 362.6 USD in 2016 to 466.5 USD in 2024, with a CAGR of 3.2%.

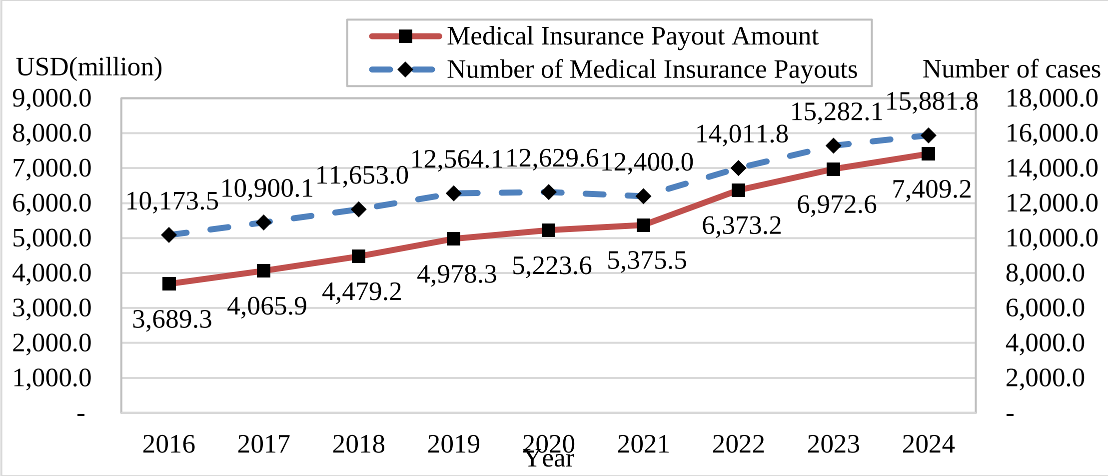

Figure 1: The Number of Cases and Payment Amounts Covered by Taiwan's Health Insurance.

Source: Taiwan Insurance Institute (2025)

While health insurance serves its primary function of providing financial protection, it continues to face challenges such as delays in claims processing, high administrative costs, and trust-related issues (Das, 2024). The claims review and evaluation processes impose substantial management costs on health insurance operations (Sakowski *et al.*, 2009; Morra *et al.*, 2011) and remain insufficient in effectively detecting fraud and abuse cases (Bose, 2020).

Implementing insurance claims systems to offset inpatient medical expenses allows hospitals to directly connect with insurance company systems. Through this process, hospitals submit patients' medical information, insurance companies calculate the claimable amounts, and the approved claims are directly deducted from the patients' inpatient medical expenses (as illustrated in Figure 2). This system can substantially reduce the administrative workload associated with insurance claim processing and review (Park *et al.*, 2012), lower the risk of bad debts for hospitals, and enhance both employee efficiency and job satisfaction (Alam *et al.*, 2016). In addition, it improves the efficiency and liquidity of financial transactions among hospitals, insurance companies, and patients, while also decreasing the likelihood of insurance fraud.

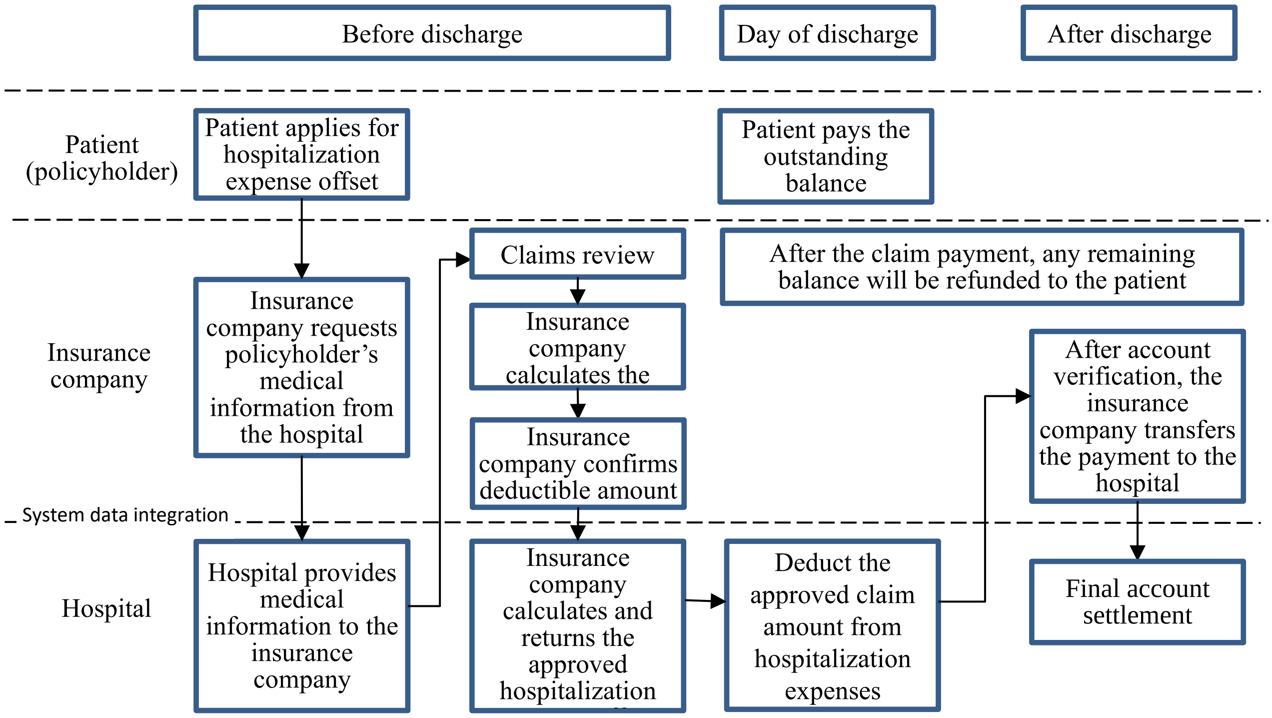

Figure 2: Procedure for Using Insurance Claims to Offset Inpatient Medical Expenses.

Although prior research has examined success factors associated with the implementation of Hospital Information Systems (HIS) (Fennelly *et al.*, 2020; Kuek and Hakkennes, 2020; Farzandipur *et al.*, 2016; Alam *et al.*, 2016; Thakkar and Davis, 2006; Gruber *et al.*, 2009), there remains a lack of systematic investigation into the critical success factors for hospitals implementing insurance claims systems to offset inpatient medical expenses. Given that the perceived importance of implementation factors may vary depending on the characteristics of technological innovations (Wejnert, 2002; Hausdorf, 2004), and that prior studies on innovation adoption have reported inconsistent findings (Wolfe, 1994), this study seeks to identify the key success factors for implementing insurance claims systems to offset inpatient medical expenses in hospital.

To achieve this, the Fuzzy Analytic Hierarchy Process (FAHP) was employed to construct a hierarchical evaluation framework, determine the relative weights of influencing factors, and rank them to identify the most critical success factors. The respondents included supervisory, managerial, and technical staff from both hospitals and insurance companies in Taiwan who were engaged in system integration efforts. Additionally, this study examined perceptual differences between the two groups, aiming to provide practical insights and actionable guidance for fostering effective collaboration in the implementation of such systems.

2. Literature Review

This chapter reviews and analyzes the factors that influence system implementation in organizations, with the goal of exploring the key factors affecting hospitals when implementing insurance claims systems to offset inpatient medical expenses and to establish an analytical framework.

2.1 Project Management

Implementation costs are widely recognized as critical determinants in an organization's decision to adopt information technology systems (Lian *et al.*, 2014; Chong and Chan, 2012; Alam *et al.*, 2011). These costs encompass initial investment, ongoing operational expenses (Kuan and Chau, 2001; Ghobakhloo *et al.*, 2011; Premkumar and Roberts, 1999), and training expenditures (Teo *et al.*, 2009). Higher perceived costs, such as those for IT equipment, training, and system maintenance, often reduce an organization’s willingness to adopt new systems (Al-Somali *et al.*, 2015). Adequate budgets and resource allocation significantly increase the likelihood of successful system implementation (Ratwani *et al.*, 2016; Boonstra *et al.*, 2014), making financial support a key factor throughout the process.

Clear project goals and effective planning are fundamental to the success of system implementation (Ali and Miller, 2017; Zhang *et al.*, 2005). It is crucial that system objectives align with the broader strategic goals of the organization (Friend, 2007; Gargeya and Brady, 2005). Hung *et al.* (2010) emphasized the importance of careful management across all stages of system implementation, such as design, development, testing, deployment, and optimization. In addition to setting clear targets and detailed plans, rigorous monitoring and control mechanisms should be in place to ensure smooth project progression (Alam *et al.*, 2016).

Successful system implementation also depends on assembling a capable, experienced team with relevant domain expertise. According to Ali and Miller (2017), senior management support, effective project leadership, and smooth communication are essential factors for successful enterprise system adoption. Barlow *et al.* (2006) also noted that well-structured project planning, competent management, and high-quality execution teams are essential for Telecare system success. Hospitals should establish appropriate internal policies, carefully select technically proficient team members, and provide them with adequate training throughout the project lifecycle (Farzandipur *et al.*, 2016).

2.2 System Quality and Functionality

The quality and stability of a system are core drivers of successful implementation (Urus and Hasim, 2020; Zhang *et al.*, 2005; Putri and Azizah, 2020). McKinney *et al.* (2002) defined system quality as the system’s processing capabilities, which include factors such as timeliness, real-time responsiveness, stability, ease of use, and reliability. System quality is influenced by both hardware and software performance, including system uptime, error response speed, and overall operational stability (Adeyinka and Mutula, 2006). DeLone and McLean (1992) suggested that system quality directly impacts both system usage and user satisfaction, thereby influencing organizational outcomes. To maintain optimal performance, organizations must allocate sufficient resources and personnel for system maintenance and timely upgrades.

Technical support is essential to sustaining system performance. It can be provided by external vendors (Putri and Azizah, 2020; Friend, 2007) or by internal IT personnel. Vendor support has been proven to significantly affect the success of information system adoption (Costa *et al.*, 2004; Sulaiman and Wickramasinghe, 2014). Additionally, the technical competence of internal staff is a key factor in successful system operation and sustainability (Wang *et al.*, 2010).

System integration and interoperability are critical for the smooth operation of health information systems (Infante-Moro *et al.*, 2022). Compatibility significantly influences organizational decisions regarding the adoption of new technologies (Chang *et al.*, 2007). Hospitals frequently encounter challenges when integrating new systems with their existing IT infrastructure (Alam *et al.*, 2016). Previous studies have highlighted that interoperability issues are particularly important for the long-term success of electronic medical record systems (Yasunaga *et al.*, 2008) and human resource information systems in hospitals (Lin *et al.*, 2012; Liu, 2011). Lin *et al.* (2012) pointed out that Health Level 7 (HL7) system implementations often conflict with hospitals' existing hardware, software, and network environments, posing additional technical challenges. Therefore, seamless System Integration and Interoperability are vital for the successful adoption of innovative health information technologies (Nilashi *et al.*, 2016).

Moreover, system functionality must align with the organization's operational needs (Putri and Azizah, 2020). Gargeya and Brady (2005) emphasized that system customization and alignment with business processes are key to successful ERP implementations. Prior to implementation, organizations should clearly define their information requirements and system specifications (Friend, 2007) to ensure both functionality completeness and scalability. Farzandipur *et al.* (2016) also stressed that system flexibility to adapt to future changes is a crucial technical consideration when deploying health information systems.

2.3 Organizational Support and Training

The attitudes and support of top managers play a pivotal role in promoting system implementation within organizations (Infante-Moro *et al.*, 2022; Ali and Miller, 2017; Chong and Chan, 2012; Leslie and Richard, 2000; Wang *et al.*, 2010; Gargeya and Brady, 2005; Zhang *et al.*, 2005; Lian *et al.*, 2014). Strong leadership can communicate the importance of system adoption (Armstrong and Sambamurthy, 1999), secure the necessary resources, and provide organizational direction (Lian *et al.*, 2014). Previous studies have shown that management support significantly influences hospitals' willingness to adopt new technologies, including picture archiving and communication systems (Chang *et al.*, 2006) and vital sign monitoring systems (Yang *et al.*, 2013).

Careful selection of project team members is another essential factor (Ali and Miller, 2017; Friend, 2007). Multidisciplinary project teams, which combine expertise across departments, are particularly effective in large system implementations like ERP (Leslie and Richard, 2000). Fennelly *et al.* (2020) emphasized the importance of comprehensive communication among all participating units, as well as familiarity with the new technology. Ash *et al.* (2003) observed that most medical centers form specialized teams to lead electronic medical record system development. Successful implementation requires the participation of personnel with both clinical and IT expertise, working in cross-functional teams to build practical and effective systems.

Staff training is a fundamental enabler of system adoption (Putri and Azizah, 2020; Ali and Miller, 2017; Zhang *et al.*, 2005). Employees need to acquire sufficient system knowledge to use it effectively (Ettlie, 1990). Hospitals with well-trained personnel are more confident in adopting new IT solutions (Lian *et al.*, 2014). Technical proficiency and familiarity with health information systems are essential for system success (Farzandipur *et al.,* 2016). Conversely, insufficient training can negatively affect care quality and patient safety. Therefore, targeted educational programs are required to improve digital literacy and confidence among healthcare workers during system implementation (Kuek and Hakkennes, 2020). Organizational investment in training and empowering learning is critical for the successful deployment of electronic medical records (Laramee *et al.*, 2011; McAlearney *et al.*, 2012). Farzandipur *et al.* (2016) emphasized that hospitals should develop comprehensive training strategies throughout the system implementation process.

Human factors are integral to the adoption of health information systems (Ahmadi *et al.*, 2015). Negative attitudes toward new systems can reduce user engagement and compromise patient care (Davis, 1989; Hillestad *et al.*, 2005). Inadequate preparation for technological change, particularly among nursing staff, can cause delays in realizing system benefits (Simpso, 1997). Resistance may stem from concerns about system compatibility with existing workflows or perceptions of increased operational burden (Ahmadi et al., 2015). Addressing these concerns is essential for smooth adoption.

2.4 User Experience and Data Security

Timely, accurate, and relevant data are essential for successful system implementation DeLone and McLean (2003). Interoperability of health data not only enhances care efficiency but also minimizes duplication of effort, which is critical for the widespread adoption of electronic health records (Ajami and Bagheri-Tadi, 2013). In healthcare environments, information security and accuracy are paramount to safeguarding patient privacy and ensuring safe clinical practices (Lin *et al*., 2012). Nah *et al.* (2001) emphasized that testing system effectiveness, verifying reliability, maintaining data integrity, and confirming proper system use are all essential steps in the final stages of system deployment.

A user-friendly interface is key to encouraging system adoption (Urus and Hasim, 2020). Simplified interfaces reduce learning time and operational errors, increasing the acceptance of health information systems among clinical staff (Kounalakis *et al.* 2003). System complexity is a critical consideration in hospital decision-making regarding information system adoption (Lin *et al*., 2012; Liu, 2011). Users' perceptions of ease of use are strongly linked to their willingness to adopt new systems (Farzandipur *et al.,* 2016). Chau (2001) and Ma (2007) demonstrated that perceived ease of use is associated with user self-efficacy, which in turn influences behavioral intention to adopt electronic health records. Designing streamlined, intuitive interfaces can significantly improve user acceptance.

All systems must provide their own level of security, with data protection being assigned the highest priority (Ahmadi *et al.*, 2014). Data security remains one of the most pressing concerns in health information system adoption (Farzandipur *et al.*, 2016; Khoumbati *et al*., 2006; Lian *et al*., 2014). Ensuring the confidentiality and protection of sensitive patient information is a priority across all health information and communication technologies implementations (Ting *et al.*, 2011). Hospitals require secure, reliable systems for data storage and retrieval (Luxton *et al.* 2012). Zaabar *et al.* (2021) emphasized that data security, privacy, and interoperability must be fully addressed before the introduction of next-generation electronic health services. Keshta and Odeh (2021) further stressed that the highly sensitive nature of electronic health records necessitates robust safeguards to protect shared healthcare data. Khoumbati *et al.* (2006) underscored that security and confidentiality must be central considerations in enterprise system integration within healthcare. Ludwick and Doucette (2009) similarly pointed out that users must prioritize patient privacy and the security of digital health information.

Finally, the active involvement of end-users throughout system design and implementation is essential for successful adoption (Gagnon *et al*., 2012). In the case of insurance claims systems for offsetting inpatient medical expenses, the number of beneficiaries covered by insurance company partnerships may directly influence system utilization rates, as the system's applicability is constrained by the insurers with whom the hospital collaborates.

2.5 Summary

The literature review indicates that the factors influencing system implementation in hospitals can generally be classified into four key dimensions: **Project Management, System Quality and Functionality, Organizational Support and Training, and User Experience and Data Security.** This classification is consistent with the framework proposed by Ajami and Bagheri-Tadi (2013), who emphasized that the successful adoption of electronic health records requires system reliability, user-centered design, and strong organizational and environmental support. Similar classifications have also been discussed in prior studies on information system implementation (e.g., Farzandipur *et al.*, 2016; Putri and Azizah, 2020). Based on this foundation, the present study adopts these four dimensions to construct a hierarchical framework for systematically exploring the key success factors for implementing insurance claims systems to offset inpatient medical expenses in hospitals.

3. The Fuzzy Analytic Hierarchy Process (FAHP)

The Analytic Hierarchy Process (AHP), developed by Thomas L. Saaty in 1971, is a widely used multi-criteria decision-making method that integrates both qualitative and quantitative analyses. It decomposes complex problems into hierarchical structures and derives relative weights through pairwise comparisons, enabling decision-makers to systematically prioritize alternatives (Saaty, 1980). AHP is valued for its simplicity, small sample size requirements, and ability to maintain consistency in judgments (Darko *et al.*, 2019; Emrouznejad and Marra, 2017).

However, AHP faces limitations in adequately capturing the subjective perceptions and judgments of evaluators when assessing criteria, which may hinder its ability to reflect the real-world challenges encountered in decision-making analysis (Csutora and Buckley, 2001). AHP requires experts to perform pairwise comparisons for each criterion, but experts may be constrained by limited information or capabilities, making it difficult to assign precise numerical values to their preferences (Xu and Liao, 2014; Liu *et al.*, 2020). To address the issues of subjectivity, imprecision, and fuzziness in decision-making, van Laarhoven and Pedrycz (1983) first integrated Zadeh's (1965) fuzzy set theory (FST) and fuzzy operations by incorporating triangular fuzzy numbers into pairwise comparison matrices. This approach aims to resolve the uncertainty and fuzziness present in real-world environments, evolving traditional AHP into the Fuzzy Analytic Hierarchy Process (FAHP).

The FAHP process in this study consists of the following steps:

Step 1: Hierarchy Construction and Pairwise Comparisons

The decision problem was structured into a three-level hierarchy, comprising the overall goal, criteria, and sub-criteria. Experts conducted pairwise comparisons using a nine-point scale proposed by Saaty (1980), where 1 infers Equally importance; 3 infers Moderately importance; 5 infers Strongly importance; 7 infers Very Strongly importance; 9 infers Extremely importance. The values of 2, 4, 6 and 8 are compromises between the previous definitions. The pairwise comparisons were organized into reciprocal matrices.

Step 2: Consistency Evaluation

To ensure logical consistency in the pairwise comparisons, the Consistency Index (*CI*) and Consistency Ratio (*CR*) were calculated. A *CR* value less than or equal to 0.1 is considered acceptable (Saaty, 1980). The formulas used are:

$$CI = (\lambda_{\max} - n)/(n-1) \quad (1)$$

$$CR = CI / RI. \quad (2)$$

where λ_max is the maximum eigenvalue of the comparison matrix, *n* is the matrix order, and *RI* (Random Index) is the Random Index based on matrix size, as illustrated in Table 1.

Table 1: The values for RI.

n	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
RI	0.00	0.00	0.58	0.90	1.12	1.24	1.32	1.41	1.45	1.49	1.51	1.48	1.56	1.57	1.58

Step 3: Establishing Triangular Fuzzy Numbers

The pairwise comparison values provided by respondents for each criterion and sub-criterion were converted into triangular fuzzy numbers (TFNs), denoted as $\tilde{A} = (l, m, u)$, where $l \leqq m \leqq u$. The membership function of a triangular fuzzy number is defined as follows (Equation 1):

$$\mu_{\tilde{A}}(x) = \begin{cases} (x-l)/(m-l), & l \le x \le m \\ (u-x)/(u-m), & m \le x \le u \\ 0, & otherwise. \end{cases} \quad (3)$$

Step 4: Constructing Fuzzy Reciprocal Matrices

For *k* evaluators comparing *n* criteria, the fuzzy reciprocal matrices were constructed by converting the pairwise comparison values into fuzzy scales. The fuzzy reciprocal value provided by the *k*-th evaluator for the *i*-th and *j*-th criteria is denoted as $\tilde{A}_{ij}^k = [l_{ij}^k,\ m_{ij}^k,\ u_{ij}^k]$, where $\tilde{A}_{ji}^k = 1/\tilde{A}_{ij}^k$.

Applying the Lambda-max method proposed by Csutora and Buckley (2001) and simplifying it, we obtain the intermediate and upper-lower bound fuzzy reciprocal matrices under the conditions where α truncation set equals 1 and 0, respectively. When α=1, we obtain the intermediate value fuzzy reciprocal matrix, when α=0, we obtain the upper and lower bound fuzzy reciprocal matrices. Next, we utilize the Normalization of the Geometric Mean of the rows (NGM) method to compute the weight matrix.

To ensure the fuzzy weights conformed to $w_l^k \le w_m^k \le w_u^k$, adjustment coefficients were calculated:

$$S_l^k = \min\left\{ \frac{w_{im}^k}{w_{il}^k} \middle| 1 \le i \le n \right\}, \quad S_u^k = \max\left\{ \frac{w_{im}^k}{w_{iu}^k} \middle| 1 \le i \le n \right\} \tag{4}$$

$$W_l^{k*} = [w_{il}^{k*}],\ w_{il}^{k*} = S_l^k w_{il}^k,\ i=1,\ldots,n \tag{5}$$

$$W_u^{k*} = [w_{iu}^{k*}],\ w_{iu}^{k*} = S_u^k w_{iu}^k,\ i=1,\ldots,n \tag{6}$$

Subsequently, these coefficients were applied to adjust the upper and lower bound positive reciprocal matrices, denoted as W_u^{k*} and W_l^{k*}, respectively, for each evaluation criterion. The fuzzy weight value for the *i*-th measurement facet by the *k*-th evaluator is denoted as $\tilde{W}_i^k = (w_{il}^{k*}, w_{im}^k, w_{iu}^{k*})$.

Step 5: Aggregating Fuzzy Weights

The aggregated fuzzy weight $\tilde{\tilde{W}}_i$ for each criterion was calculated by averaging the weights across all *k* evaluators:

$$\tilde{\tilde{W}}_i = \frac{1}{k}(\tilde{W}_i^1 \oplus \tilde{W}_i^2 \oplus \ldots, \oplus \tilde{W}_i^k),\ i=1,2,\ldots,n \tag{7}$$

Step 6: Defuzzification

The weights of the criteria and sub-criteria were obtained through the defuzzification method proposed by Chen and Hsieh (2000):

$$R(\tilde{\tilde{W}}_i) = \frac{(W_{il} + 4W_{im} + W_{iu})}{6} \tag{8}$$

Where $\tilde{\tilde{W}}_i = (W_{il}, W_{im}, W_{iu})$.

Step 7: Normalization

Normalization is applied to ensure that the sum of weight values equals 1.

$$Ni = \frac{R(\tilde{\tilde{W}}_i)}{\sum_{i=1}^{n} R(\tilde{\tilde{W}}_i)} \tag{9}$$

4. Result

4.1 Hierarchy construction

The research framework was developed based on an extensive literature review, summarizing factors influencing the implementation of insurance claims systems to offset inpatient medical expenses in hospitals. In December 2024, two experts with over 20 years of hospital experience and direct involvement in system implementation participated in two rounds of discussions to refine the evaluation framework. The basic information of the experts involved in the framework development and pretest is provided in Table 2, and the finalized research framework is illustrated in Figure 3. Following the finalization of the hierarchical structure, a pretest of the questionnaire was conducted in mid-January 2025 to ensure its clarity and accuracy.

Table 2: Profiles of Experts Participating in Framework Development and Pretest

ID	Affiliated Institution	Department and Title	Gender	Age	Years of Experience	Education Level
A	Hospital	Supervisor, Inpatient Services	Female	44	28 years	Master's degree
B	Hospital	Supervisor, Front Desk Operations	Female	46	23 years	Master's degree

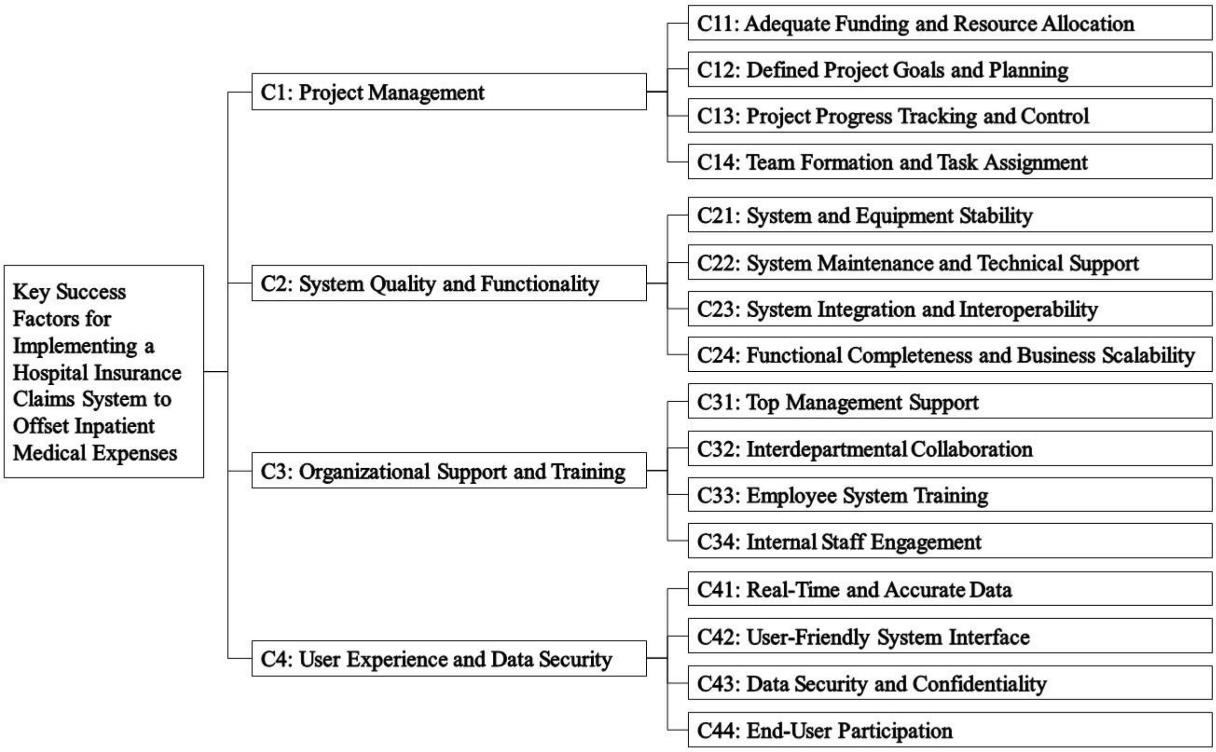

Figure 3: Hierarchical Structure of the FAHP Model.

4.2 Data collection

A total of 52 valid responses were collected from the questionnaire survey conducted between February 6 and February 26, 2025, including 32 from hospital personnel and 20 from insurance company personnel in Taiwan. The respondents included supervisory, managerial, and technical staff from both hospitals and insurance companies, covering departments such as medical records, social services, information technology, customer service, and business development.

To ensure the reliability of the collected data, consistency checks were performed on all returned questionnaires. For responses that initially failed the consistency test or contained incomplete answers, the researchers conducted follow-up verification with the respondents to clarify the data. After verification, all 52 questionnaires met the required consistency ratio ($CR \leq 0.1$) and were deemed valid for analysis. The respondents' demographic profiles are summarized in the Appendix.

4.3 Prioritization of criteria and sub-criteria using FAHP

The consistency ratio (*CR*) values for all valid responses ranged from 0.0000 to 0.0966, which meets the acceptable threshold of $CR \leq 0.1$, as proposed by Saaty (1980). This indicates that the pairwise comparison responses provided by the participants were acceptably consistent.

The Fuzzy Analytic Hierarchy Process (FAHP) was applied to calculate the weights of the criteria and sub-criteria influencing the implementation of insurance claims systems to offset inpatient medical expenses in hospital. The detailed distribution of the resulting weights is presented in **Table 3**.

Criteria and sub-criteria	Total					Hospitals					Insurance Companies				
	W_l	W_m	W_u	Global weights	Normalized Global weights and Ranking	W_l	W_m	W_u	Global weights	Normalized Global weights and Ranking	W_l	W_m	W_u	Global weights	Normalized Global weights and Ranking
C1: Project Management	**.1940**	**.2083**	**.2158**	**.2072**	**.2074 (3)**	**.2218**	**.2350**	**.2445**	**.2344**	**.2345 (3)**	**.1495**	**.1657**	**.1700**	**.1637**	**.1641 (3)**
C11: Adequate Funding and Resource Allocation	.0563	.0635	.0681	.0631	.0633 (8)	.0534	.0598	.0652	.0596	.0598 (8)	.0553	.0639	.0670	.0630	.0632 (7)
C12: Defined Project Goals and Planning	.0641	.0734	.0785	.0727	.0729 (6)	.0723	.0826	.0888	.0819	.0821 (5)	.0505	.0586	.0620	.0578	.0580 (8)
C13: Project Progress Tracking and Control	.0246	.0279	.0308	.0279	.0280 (15)	.0259	.0289	.0324	.0290	.0291 (14)	.0215	.0251	.0271	.0249	.0249 (12)
C14: Team Formation and Task Assignment	.0376	.0435	.0476	.0432	.0433 (10)	.0551	.0637	.0702	.0634	.0635 (7)	.0159	.0181	.0194	.0179	.0180 (14)
C2: System Quality &Functionality	**.2952**	**.3144**	**.3334**	**.3144**	**.3147 (1)**	**.2512**	**.2666**	**.2825**	**.2667**	**.2668 (2)**	**.3655**	**.3909**	**.4149**	**.3907**	**.3917 (1)**
C21: System and Equipment Stability	.1198	.1376	.1478	.1363	.1367 (1)	.0957	.1093	.1172	.1083	.1086 (2)	.1631	.1885	.2029	.1867	.1874 (1)
C22: System Maintenance and Technical Support	.0349	.0389	.0438	.0390	.0391 (11)	.0320	.0353	.0397	.0355	.0356 (12)	.0377	.0428	.0484	.0429	.0430 (10)
C23: System Integration and Interoperability	.0703	.0816	.0924	.0815	.0817 (4)	.0659	.0753	.0852	.0754	.0756 (6)	.0729	.0871	.0987	.0867	.0870 (4)
C24: Functional Completeness and Business Scalability	.0493	.0563	.0649	.0566	.0567 (9)	.0403	.0467	.0542	.0469	.0470 (10)	.0648	.0725	.0825	.0729	.0732 (6)
C3: Organizational Support and Training	**.1563**	**.1668**	**.1783**	**.1670**	**.1672 (4)**	**.1845**	**.1967**	**.2099**	**.1968**	**.1969 (4)**	**.1111**	**.1190**	**.1277**	**.1192**	**.1195 (4)**
C31: Top Management Support	.0603	.0683	.0744	.0680	.0682 (7)	.0819	.0930	.1005	.0924	.0927 (4)	.0325	.0367	.0407	.0366	.0368 (11)
C32: Interdepartmental Collaboration	.0263	.0296	.0341	.0298	.0299 (14)	.0394	.0442	.0513	.0446	.0447 (11)	.0106	.0121	.0135	.0121	.0121 (16)
C33: Employee System Training	.0341	.0386	.0424	.0385	.0386 (12)	.0229	.0261	.0294	.0261	.0262 (15)	.0409	.0464	.0503	.0461	.0463 (9)
C34: Internal Staff Engagement	.0263	.0303	.0353	.0305	.0306 (13)	.0288	.0334	.0391	.0336	.0337 (13)	.0208	.0239	.0277	.0240	.0241 (13)
C4: User Experience & Data Security	**.2934**	**.3105**	**.3264**	**.3103**	**.3106 (2)**	**.2876**	**.3018**	**.3162**	**.3018**	**.3019 (1)**	**.3028**	**.3243**	**.3427**	**.3238**	**.3247 (2)**
C41: Real-Time and Accurate Data	.0757	.0866	.0978	.0866	.0869 (3)	.0820	.0934	.1043	.0933	.0936 (3)	.0652	.0745	.0862	.0749	.0752 (5)
C42: User-Friendly System Interface	.0651	.0736	.0817	.0736	.0738 (5)	.0461	.0530	.0591	.0528	.0530 (9)	.0971	.1090	.1205	.1089	.1093 (3)
C43: Data Security and Confidentiality	.1143	.1285	.1392	.1279	.1283 (2)	.1154	.1300	.1392	.1291	.1295 (1)	.1121	.1254	.1385	.1253	.1258 (2)
C44: End-User Participation	.0202	.0218	.0241	.0219	.0220 (16)	.0237	.0254	.0278	.0255	.0256 (16)	.0143	.0155	.0177	.0156	.0157 (15)

The results indicate that System Quality and Functionality (0.3147) is considered the most critical criterion overall, followed closely by User Experience and Data Security (0.3106), Project Management (0.2074), and Organizational Support and Training (0.1672). At the sub-criteria level, the five most important factors, ranked by overall weight, are System and Equipment Stability (0.1367), Data Security and Confidentiality (0.1283), Real-Time and Accurate Data (0.0869), System Integration and Interoperability (0.0817), and User-Friendly System Interface (0.0738). Together, these top five sub-criteria account for 50.74% of the total overall weight.

Further group-specific analysis revealed that hospital respondents placed the highest importance on User Experience and Data Security, the top three sub-criteria are Data Security and Confidentiality (0.1295), System and Equipment Stability (0.1086), and Real-Time and Accurate Data (0.0936). In contrast, insurance company respondents considered System Quality and Functionality as the most critical criterion, with the top three sub-criteria given to System and Equipment Stability (0.1874), Data Security and Confidentiality (0.1258), and User-Friendly System Interface (0.1093).

Additionally, the comparison of sub-criteria rankings between the two groups showed that hospitals prioritized Top Management Support, Team Formation and Task Assignment, and Interdepartmental Collaboration. Conversely, insurance companies placed greater emphasis on User-Friendly System Interface, Employee System Training, and Functional Completeness and Business Scalability. Differences in the importance rankings of the remaining sub-criteria were relatively minor.

5. Discussion

This study identified the key success factors for the implementation of insurance claims systems to offset inpatient medical expenses in hospital. Among these, **System and Equipment Stability** emerged as the most critical factor, underscoring the importance of ensuring system reliability throughout both the implementation and operational phases. This finding is consistent with the perspective of Putri and Azizah (2020). From a management standpoint, hospitals should ensure the robustness and stability of system platforms and related equipment through reliable server configurations, stable network architecture, and effective load balancing mechanisms. These measures help prevent workflow disruptions caused by system failures or processing bottlenecks.

Data Security and Confidentiality ranked second, aligning with the findings of Keshta and Odeh (2021), Zaabar *et al.* (2021), and Luxton *et al.* (2012). The system transmits highly sensitive information such as patient records, diagnoses, treatment plans, and financial data. Any security breach may not only lead to legal liabilities but also reduce patients' trust and willingness to use the system. It is therefore essential for system administrators to prioritize data storage and cybersecurity measures, including access control, encryption, intrusion detection, and regular security audits. Establishing clear security policies and response protocols can significantly improve an organization's data security resilience.

Real-Time and Accurate Data ranked third in importance, consistent with the findings of DeLone and McLean (2003). In the context of insurance claims systems, timely and accurate data exchange ensures the proper transmission of patient information, claim amounts, and settlement records. Inaccuracies or delays in data flow can lead to errors in claims processing, payment delays, or disputes among stakeholders. To mitigate these risks, system implementation should incorporate capabilities for real-time data acquisition, validation procedures, and standardized data processing protocols to ensure consistent and dependable information flow across all stages of the claims process.

System Integration and Interoperability was identified as the fourth most important factor, echoing the results of Infante-Moro *et al.* (2022) and Alam *et al.* (2016). Seamless integration between hospital and insurance company systems is crucial for accurate data exchange and efficient system operation. Early coordination of technical standards, clear interface specifications, and cross-organizational collaboration can help prevent integration failures and reduce additional resource consumption.

User-Friendly System Interface ranked fifth in importance, in line with the findings of Urus and Hasim (2020) and Farzandipur *et al.* (2016). A simple and intuitive interface lowers the learning curve, reduces the risk of operational errors, and enhances user acceptance. Hospitals should prioritize user-centered design, streamline system processes, and provide clear operational guidance to facilitate system adoption. Insurance companies should ensure that the platforms they provide are designed with usability in mind to facilitate efficient operation. Additionally, hospitals can play a role by providing feedback on interface usability to help improve system alignment with clinical workflows.

When comparing the perceptions of hospital and insurance company respondents, hospitals placed greater emphasis on internal organizational management, particularly in terms of Top Management Support, Team Formation and Task Assignment, and Interdepartmental Collaboration to ensure smooth system integration. In contrast, insurance companies prioritized Employee System Training, User-Friendly Interfaces, and Functional Completeness and Business Scalability, reflecting their focus on system usability and future adaptability to changes in claims processing mechanisms. Effective collaboration and mutual understanding between both parties are essential to ensure successful implementation and long-term sustainability of the insurance claims system.

6. Conclusions

1. This study employed the FAHP to systematically identify the key success factors for implementing hospital insurance claims systems to offset inpatient medical expenses in hospital. Drawing on an extensive literature review and expert interview, a hierarchical evaluation framework was developed. It comprises four main criteria: Project Management, System Quality and Functionality, Organizational Support and Training, and User Experience and Data Security, along with sixteen corresponding sub-criteria.
2. The study reveals that System Quality and Functionality is the most critical criterion for successful system implementation. Among the sub-criteria, System and Equipment Stability, Data Security and Confidentiality, and Real-Time and Accurate Data were identified as the top three key success factors. These findings emphasize the importance of ensuring stable system operations, securing sensitive patient and financial data, and maintaining timely and accurate information transmission to support efficient claims processing and expense settlement.
3. The study reveals perceptual differences between hospitals and insurance companies regarding key success factors. Hospitals place greater emphasis on system implementation management, particularly in terms of Top Management Support, Team Formation and Task Assignment, and Interdepartmental Collaboration to ensure smooth system integration. In contrast, insurance companies prioritize hospital staff's familiarity with system operations, highlighting the importance of Employee System Training, User-Friendly System Interface, and Functional Completeness and Business Scalability to enhance claims processing efficiency and accommodate future system adaptations.
4. This study contributes to the literature by providing a systematic evaluation of the critical success factors for hospital insurance claims system implementation, offering valuable references for hospitals and insurance companies. The findings can guide management in resource allocation, project planning, and cross-organizational coordination, ultimately enhancing the success rate of system implementation and improving the efficiency and quality of medical and insurance services.

7. Suggestion

This study employed the FAHP to systematically identify and prioritize the key success factors, with a focus on clarifying the relative importance of each factor. FAHP is particularly appropriate for problems with well-defined hierarchical structures and was suitable given the emphasis on ranking and the limited sample size. However, the method assumes independence among criteria and sub-criteria, and does not account for potential interrelationships. Future studies may consider adopting alternative approaches,to explore possible interdependencies among factors.

In addition, this study provides practical insights for the successful implementation of hospital insurance claims systems and offers a foundation for developing future collaborative strategies between hospitals and insurance companies. Future research may also incorporate case studies to validate these findings across diverse healthcare environments.

References

Adeyinka, T. and Mutula, S. (2010). A proposed model for evaluating the success of WebCT course content management system. *Computers in Human Behavior, 26*(6), 1795-1805.

Ahmadi, H., Nilashi, M., and Ibrahim, O.(2015). Organizational decision to adopt hospital information system: An empirical investigation in the case of Malaysian public hospitals. *International journal of medical informatics, 84*(3), 166-188.

Ahmadi, H., Rad, M. S., Nazari, M. and Nilashi, M., and Ibrahim, O. (2014). Evaluating the factors affecting the implementation of hospital information system (HIS) using AHP method. *Life Science Journal*, *11*(3), 202-207.

Ajami, S. and Bagheri-Tadi T.(2013). Barriers for adopting electronic health records (EHRs) by physicians. *Acta Informatica Medica, 21*(2), 129-134.

Alam, M. G. R., Masum, A. K. M., Beh, L. S., and Hong, C.S(2016). Critical Factors Influencing Decision to Adopt Human Resource Information System (HRIS) in Hospitals. *PLoS One, 11*(8), 1-22.

Alam, S. S., Ali, M. Y., and Mohd. Jani, M. F.(2011). An empirical study of factors affecting electronic commerce adoption among SMEs in Malaysia. *Journal of Business Economics and Management, 12*(2), 375-399.

Ali, M. and Miller, L. (2017). ERP System Implementation in Large Enterprises-A Systematic Literature Review. *Journal of Enterprise Information Management*, *30*(4), 1-30

Al-Somali, S. A., Gholami, R., and Clegg, B.(2015). A stage-oriented model (SOM) for e-commerce adoption: a study of Saudi Arabian organisations. *Journal of Manufacturing Technology Management*, *26*(1), 2-35.

Armstrong, C. P., and Sambamurthy, V.(1999). Information technology assimilation in firms: The influence of senior leadership and IT infrastructures. *Information systems research. 10*(4), 304327.

Ash, J. S., Stavri, P. Z., Dykstra, R., and Fournier, L. (2003). Implementing computerized physician order entry: the importance of special people. *International Journal of Medical Informatics, 69*(2-3), 235-250.

Barlow, J., Bayer, S., & Curry, R. (2006). Implementing complex innovations in fluid multi- stakeholder environments: experiences of _telecare. *Technovation*, *26*(3), 396-406.

Boonstra, A., Versluis, A., and Vos, J. F. J.(2014). Implementing electronic health records in hospitals: a systematic literature review. *BMC Health Services Research, 14*, 370.

Bose A. (2020). Healthcare without Health Insurance: A Peer to Peer Healthcare Payment Platform. Health Care: Current Reviews, 8(4), 1-7.

Chang, I. C., Hwang, H. G., Hung, M. C., Lin, M. H., and Yen, D. C.(2007). Factors affecting the adoption of electronic signature: Executives' perspective of hospital information department. *Decision Support Systems, 44*(1), 350-359.

Chang, I. C., Hwang, H. G., Yen, D. C., Lian, J. W.(2006). Critical factors for adopting PACS in Taiwan: Views of radiology department directors. *Decision Support Systems, 42*(2), 10421053.

Chau, P. Y.(2001). Influence of computer attitude and self-efficacy on IT usage behavior. *Journal of Organizational and End User Computing, 13*(1), 26-33.

Chen, S. H. and Hsieh, C. H. (2000). Representation, ranking, distance, and similarity of L-R type fuzzy number and application. *Australian Journal of Intelligent Processing Systems, 6*(4), 217-229.

Chong, A. Y. L. and Chan, F. T. (2012). Structural equation modeling for multi-stage analysis on radio frequency identification (RFID) diffusion in the health care industry. *Expert Systems with Applications, 39*(10), 8645-8654.

Costa, A. L., de Oliveira, M. M. B., and de Oliveira, M. R. An information system for drug prescription and distribution in a public hospital. *International journal of medical informatics. 2004; 73*(4), 371-81.

Csutora, R. and Buckley, J. J. (2001). Fuzzy Hierarchical Analysis: the Lambda-max Method. *Fuzzy Set and Systems, 120*(2), 181-195.

Darko, A., Chan, A. P. C., Ameyaw, E. E., Owusu, E. K., Pärn, E. and Edwards, D. J. (2019). Review of application of analytic hierarchy process (AHP) in construction. International Journal of Construction Management, 19(5), 436-452.

Das, D. (2024). BISECTION: Blockchain-enabled Secure health Insurance processing. *International Journal of Ad Hoc and Ubiquitous Computing, 46(*1), 44-63.

Davis, F. D.(1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, *13*(3), 319-340.

DeLone, W. H. and McLean, E. R. (2003). The DeLone and McLean Model of Information Systems Success: A Ten-Year Update. *Journal of Management Information Systems, 19*(4), 9-30.

Emrouznejad, A. & Marra, M. (2017). The state of the art development of AHP (1979–2017): a literature review with a social network analysis. *International Journal of Production Research, 55***,** 6653-6675.

Ettlie, J. E.(1990). What makes a manufacturing firm innovative? *The Executive*, *4*(4), 7-20.

Farzandipur, M., Jeddi,F. R., and Azimi, E.(2016). Factors Affecting Successful Implementation of Hospital Information Systems. *Acta Informatica Medica*, *24*(1), 51-55.

Fennelly, O., Cunningham, C., Grogan, L., Cronin, H., O'Shea, C., Roche, M., Lawlor, F., and O'Hare, N. (2020). Successfully implementing a national electronic health record: a rapid umbrella review. *International Journal of Medical Informatics. 144*, 1-17.

Friend, D. (2007). Executive Information System: Successes and Failures, Insights and Misconceptions. *Journal of Information Systems Management*, *3*(4), 31-36.

Gagnon, M-P, Desmartis, M., Labrecque, M. Car, J. Pagliari, C., Pluye, P., Frémont, P., Gagnon, J., Tremblay, N., and Légaré, F. (2012). Systematic Review of Factors Influencing the Adoption of Information and Communication Technologies by Healthcare Professionals. *Journal of Medical Systems, 36*(1), 241-277.

Gargeya, V. B. and Brady, C. (2005). Success and failure factors of adopting SAP in ERP system implementation. *Business Process Management Journal*, *11*(5), 501-516.

Ghobakhloo, M., Arias-Aranda, D., and Benitez-Amado, J.(2011). Adoption of e-commerce applications in SMEs. *Industrial Management & Data Systems, 111*(8), 1238-1269.

Gruber, D., Cummings, G. G., LeBlanc, L. and Smith, D. L. (2009). Factors influencing outcomes of clinical information systems implementation: a systematic review. *Computers, Informatics, Nursing*, *27*(3), 151-163.

Hausdorf, P. A. and Duncan, D.(2004). Firm size and Internet recruiting in Canada: A preliminary investigation. *Journal of small business management*, *42*(3), 325-334.

Hillestad, R., Bigelow, J., and Bower, A.(2005). Can electronic medical record systems transform health care? Potential health benefits, savings, and costs. *Health Affairs*, *24*(5): 1103-1117.

Hung, S. Y., Hung, W. H., Tsai, C. A., and Jiang, S. C.(2010). Critical factors of hospital adoption on CRM system: Organizational and information system perspectives. *Decision support systems, 48*(4), 592-603.

Infante-Moro, A., Infante-Moro, J. C., Gallardo-Pérez, J., and Martínez-López, F. J. (2022). Key Factors in the Implementation of E-Proctoring in the Spanish University System. *Sustainability, 14*, 1-16.

Keshta, I. and Odeh, A.(2021). Security and privacy of electronic health records: Concerns and challenges. *Egyptian Informatics Journal*, *22*(2), 177-183.

Khoumbati, K., Themistocleous, M., & Irani, Z. (2006). Evaluating the adoption of enterprise application integration in health-care organizations. Journal of management information systems, 22(4), 69-108.

Kounalakis, D. K., Lionis, C., Okkes, I., and Lamberts, H.(2003). Developing an Appropriate EPR System for the Greek Primary Care Setting. *Journal of Medical Systems*, *27*(3), 239-246.

Kuan, K. K. and Chau, P. Y.(2001). A perception-based model for EDI adoption in small businesses using a technology-organization-environment framework. *Information & management*, *38*(8), 507-521.

Kuek, A. and Hakkennes, S.(2020). Healthcare staff digital literacy levels and their attitudes towards information systems. *Health Informatics Journal. 26*(1):592-612.

Laramee, A. S., Bosek, M., and Kasprisin, C. A.(2011) Learning from within to ensure a successful implementation of an electronic health record. *Computers, Informatics, Nursing*, *29*(8), 468-477.

Leslie, W. and Richard, S. (2000). The role of the CIO and IT function in ERP. *Communications of the ACM*, *43*, 32-38.

Lian, J. W., Yen, D. C., and Wang, Y. T. (2014). An exploratory study to understand the critical factors affecting the decision to adopt cloud computing in Taiwan hospital. *International Journal of Information Management*, *34*(1), 28-36.

Lin, C. H., Lin, I. C., Roan, J. S., and Yeh, J. S.(2012). Critical Factors Influencing Hospitals' Adoption of HL7 Version 2 Standards: An Empirical Investigation. *Journal of medical systems, 36*(3), 1183-1192.

Liu C. F.(2011). Key factors influencing the intention of telecare adoption: An institutional perspective. *Telemedicine and e-Health*, *17*(4), 288-293.

Liu, Y., Eckert, C. M., and Earl, C.(2020). A review of fuzzy AHP methods for decision-making with subjective judgements. Expert Systems with Applications, 161, 67 pages.

Ludwick, D. A. and Doucette, J.(2009). Primary Care Physicians' Experience with Electronic Medical Records: Barriers to Implementation in a Fee-for-Service Environment. International Journal of Telemedicine and Application 2009, 9 pages.

Luxton, D. D., Kayl, R. A., and Mishkind, M. C. (2012). mHealth data security: The need for HIPAA-compliant standardization. *Telemedicine and e-Health*, *18*(4), 284-288.

Mars, M. and Scott, R. E. (2010). Global e-health policy: a work in progress. *Health Affairs*, *29*(2), 237-243.

McAlearney, A. S., Robbins, J., and Kowalczyk, N.(2012). The role of cognitive and learning theories in supporting successful EHR system implementation training: a qualitative study. *Medical Care Research and Review*, *69*(3), 294-315.

McKinney, V., Yoon, K., and Zahedi, F.M.(2002).The measurement of web customer satisfaction: an expectation and disconfirmation approach. *Information Systems Research*, *13*(3), pp.296-315.

Morra, D., Nicholson, S., Levinson, W., Gans, D. N., Hammons, T., and Casalino, L. P.(2011). US physician practices versus Canadians: spending nearly four times as much money interacting with payers. *Health Affairs*, *30*(8), 1443-1450.

Nah, G. F. H., Lau, J. L. S. and Kuang, J. (2001). Critical factors for successful integration of enterprise resource planning. *Business Process Management Journal*, *7*(3), 285-296.

Nilashi, M., Ahmadi, H., Ahani, A, Ibrahim, O., and Almaee, A. (2016). Evaluating the Factors Affecting Adoption of Hospital Information System Using Analytic Hierarchy Process. *Journal of Soft Computing and Decision Support Systems*, *3*(1), 8-35

Park,Y. T., Yoon, J. S., Speedie, S. M., Yoon, H., and Lee, J.(2012). Health Insurance Claim Review Using Information Technologies. *Health Information Research*, *18*(3), 215-224.

Porter, M. E. and Millar, V. E. (1985). How information gives you competitive advantage. *Harvard Business Review*, *(63)*4, 149-160.

Premkumar, G. and Roberts, M.(1999). Adoption of new information technologies in rural small businesses. *Omega*, *27*(4), 467-484.

Putri, A. D. and Azizah, A. H. (2020). Analysis of Critical Success Factors (CSF) in Enterprise Resource Planning (ERP) Implementation using Extended Technology Acceptance Model (TAM) at Trading and Distribution Company. *International Conference on Electrical, Telecommunication and Computer Engineering (ELTICOM)*, *2*, 129-135.

Ratwani,R., Fairbanks, T., and Savage, E.(2016). Mind the Gap. A systematic review to identify usability and safety challenges and practices during electronic health record implementation. *Applied Clinical Informatics*, *7*(4), 1069–1087.

Saaty, T. L. (1980). *The Analytic Hierarchy Process*, Boston: McGraw Hill Inc.

Sakowski, J. A., Kahn, J. G., Kronick, R. G., Newman, J. M., and Luft, H. S.(2009). Peering into the black box: billing and insurance activities in a medical group. *Health Affairs*, *28*(4), 544-554.

Simpson, R.(1997). Are staff prepared for the new information-based hospital enterprise? *Nursing Administration Quarterly*, *21*(2), 85-87.

Sulaiman, H. and Wickramasinghe, N.(2014). Assimilating healthcare information systems in a Malaysian Hospital. *Communications of the Association for Information Systems*, *34*, 1291-1318.

Taiwan Insurance Institute(2024). Statistics on Life Insurance Business, https://www.tii.org.tw/tii/information/information1/000007.html。

Teo, T. S H., Lin, S., and Lai, K-h.(2009). Adopters and non-adopters of e-procurement in Singapore: An empirical study. *Omega*, *37*(5), 972–987.

Thakkar, M. and Davis, D. C.(2006). Risks, Barriers, and Benefits of EHR systems: A Comparative Study Based on Size of Hospital. *Perspectives in Health Information*, *3*(5), 1-19.

Ting, S., Kwok, S. K., Tsang, A. H., and Lee, W. (2011). Critical elements and lessons learnt from the implementation of an RFID-enabled healthcare management system in a medical organization. *Journal of medical systems*, *35*(4), 657-669.

Urus, S. T. and Hasim, K. (2020). Critical Success Factors of Accounting Information Systems (AIS): Empirical Evidence from Malaysian Organizations. *Management & Accounting Review*, *19*(1), 234-265.

van Laarhoven, P. J. M. and Pedryce, W. (1983). A fuzzy extension of Saaty's priority theory. *Fuzzy Sets and Systems*, *11*(3), 229-241.

Wang, Y. M., Wang, Y. S., and Yang, Y. F. (2010). Understanding the determinants of RFID adoption in the manufacturing industry. *Technological Forecasting and Social Change, 77*(5), 803-815.

Wejnert, B.(2002). Integrating models of diffusion of innovations: A conceptual framework. *Annual review of sociology, 28,* 297-326.

Wolfe, J. M.(1994). Guided search 2.0 a revised model of visual search. *Psychonomic bulletin & review, 1*(2), 202-238.

Xu, Z. and Liao, H. (2014). Intuitionistic Fuzzy Analytic Hierarchy Process. *IEEE Transactions on Fuzzy Systems*, *22***,** 749-761.

Yang, Z., Kankanhalli, A., Ng, B.-Y., and Lim, J. T. Y. (2013). Analyzing the enabling factors for the organizational decision to adopt healthcare information systems. *Decision Support Systems*, *55*(3), 764-776.

Yasunaga, H., Imamura T, Yamaki, S. and Endo, H. (2008). Computerizing medical records in Japan. *International Journal of Medical Informatics, 77*(10), 708-713.

Zaabar, B., Cheikhrouhou, O., Jamil, F., Ammi, M., and Abid, M.(2021). HealthBlock: A secure blockchain-based healthcare data management system. Computer Networks, 200, 16 pages.

Zadeh, L. A. (1965). Fuzzy set. *Information Control, 8*(3), 338-353.

Zhang, Z., Lee, M. K. O., Huang, P., Zhang, L., and Huang, X. (2005). A framework of ERP systems implementation success in China: An empirical study. *International Journal of Production Economics, 98*(1), 56-80.

APPENDIX

Table A1 Basic Demographic Information of Respondents

No.	Industry Type	Gender	Age	Department and Title	Years of Experience	Education Level
1	Hospital	Female	47	Supervisor, Medical Records Department	26 years	Master's Degree or Above
2	Hospital	Female	55	Manager, Teaching and Research Department	21 years, 2 months	Bachelor's Degree
3	Hospital	Female	28	Programmer, Systems Application Department	3 years, 3 months	Master's Degree or Above
4	Hospital	Male	44	Worker, Social Service Department Social	14 years	Bachelor's Degree
5	Hospital	Female	39	Clerk, Medical Records Department	15 years	Bachelor's Degree
6	Hospital	Female	47	Supervisor, Medical Business Department	21 years	Bachelor's Degree
7	Hospital	Female	62	Supervisor, Telephone Service Department	33 years	Bachelor's Degree
8	Hospital	Male	49	Analyst, Information Technology Department Systems	24 years, 11 months	Bachelor's Degree
9	Hospital	Female	47	Manager, Medical Records Department	15 years, 11 months	Bachelor's Degree
10	Hospital	Male	51	Chief, Information Technology Department Section	20 years, 5 months	Bachelor's Degree
11	Hospital	Female	49	Programmer, Information Technology Department Senior	22 years, 6 months	Bachelor's Degree
12	Hospital	Male	33	Programmer, Information Technology Department	6 years, 6 months	Bachelor's Degree
13	Hospital	Male	38	Worker, Social Service Department Social	14 years	Bachelor's Degree
14	Hospital	Female	47	Supervisor, Medical Engineering Department	17 years, 4 months	Master's Degree or Above
15	Hospital	Female	47	Supervisor, Information Technology Department	18 years, 6 months	Bachelor's Degree
16	Hospital	Female	51	Supervisor, Social Service Department	16 years	Bachelor's Degree
17	Hospital	Female	51	Programmer, Information Technology Department	23 years	Bachelor's Degree
18	Hospital	Female	46	Supervisor, Front Desk Operations Department	23 years	Master's Degree or Above
19	Hospital	Female	59	Supervisor, Medical Records Department	33 years, 6 months	Bachelor's Degree
20	Hospital	Female	43	Nurse, Nursing Department Deputy Chief	23 years, 6 months	Bachelor's Degree
21	Hospital	Male	55	Supervisor, Information Technology Department	25 years, 6 months	Bachelor's Degree
22	Hospital	Male	55	Director, Facilities Department	22 years, 1 month	Master's Degree or Above
23	Hospital	Female	47	Supervisor, Clinical Pathology Department	19 years	Master's Degree or Above
24	Hospital	Female	43	Leader, Information and Data Analysis BI Department Group	20 years, 4 months	Bachelor's Degree
25	Hospital	Female	53	Director, Clinical Pathology Department Acting Technical	26 years, 3 months	Bachelor's Degree
26	Hospital	Female	44	Social Worker, Social Service	15 years	Master's Degree or

				Department		Above
27	Hospital	Female	46	Supervisor, Medical Records Department	18 years, 2 months	Bachelor's Degree
28	Hospital	Female	57	Supervisor, Medical Records Department	27 years, 4 months	Bachelor's Degree
29	Hospital	Male	35	Leader, Information and Data Analysis Department Medical Business Department Group	7 years	Bachelor's Degree
30	Hospital	Male	54	Supervisor, Nursing Care Department	24 years	Bachelor's Degree
31	Hospital	Male	54	Director, Customer Service Center Deputy	25 years, 2 months	Master's Degree or Above
32	Hospital	Male	61	Specialist, Facilities Department	28 years, 3 months	Bachelor's Degree
33	Insurance company	Male	46	Manager, Business Department	16 years	Bachelor's Degree
34	Insurance company	Male	51	Director, Business Department	16 years	Bachelor's Degree
35	Insurance company	Female	39	Manager, Business Development Department	11 years	Master's Degree or Above
36	Insurance company	Female	48	Manager, Business Department Area	28 years	Bachelor's Degree
37	Insurance company	Male	31	Manager, Business Department Area	7 years, 6 months	Bachelor's Degree
38	Insurance company	Male	43	Leader, Sales Promotion Group	16 years	Bachelor's Degree
39	Insurance company	Female	48	Leader, Sales Promotion Group	12 years	High School Diploma
40	Insurance company	Female	62	Leader, Sales Promotion Group	13 years	Bachelor's Degree
41	Insurance company	Female	47	Manager, Business Department Area	20 years	Bachelor's Degree
42	Insurance company	Male	37	Manager, Business Department Area	11 years	Master's Degree or Above
43	Insurance company	Female	67	Leader, Sales Promotion Group Business Group	30 years	High School Diploma
44	Insurance company	Female	66	Leader, Sales Promotion Group Business Group	26 years	High School Diploma
45	Insurance company	Female	45	Director, Business Department	13 years, 5 months	Bachelor's Degree
46	Insurance company	Female	61	Leader, Sales Promotion Group Business Group	26 years	High School Diploma
47	Insurance company	Female	57	Sales Promotion Group Deputy Manager,	8 years	High School Diploma
48	Insurance company	Male	38	Manager, Business Communication Department	15 years	Bachelor's Degree
49	Insurance company	Female	31	Manager, Business Department	4 years, 8 months	Master's Degree or Above
50	Insurance company	Male	39	Manager, Business Department Assistant	15 years, 4 months	Bachelor's Degree
51	Insurance company	Female	41	Personnel, Business Department Senior Business	17 years	Bachelor's Degree
52	Insurance company	Male	41	Leader, Sales Promotion Group	8 years	Bachelor's Degree