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ARTICLE

Enhanced Information Systems Success Model for Patient Information Assurance

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ABSTRACT

The current health information systems have many challenges such as lack of standard user interfaces, data security and privacy issues, inability to uniquely identify patients across multiple hospital information systems, probable misuse of patient data, high technological costs, resistance to technology deployments in hospital management, lack of data gathering, processing and analysis standardization. All these challenges, among others hamper either the acceptance of the health information systems, operational efficiency or expose patient information to cyber attacks. In this paper, an enhanced information systems success model for patient information assurance is developed using an amalgamation of Technology Acceptance Model (TAM) and Information Systems Success Model (ISS). This involved the usage of Linear Structured Relationship (LISREL) software to model a combination of ISS and Intention to Use (ITU), TAM and ITU, ISS and user satisfaction (US), and finally TAM and US. The sample size of 110 respondents was obtained based on the total population of 221 using the Conhrans formula. Thereafter, simple random sampling was employed to select members within each category of employees to take part in the study. The questionnaire as a research tool was checked for reliability via Cronbach's Alpha. The results obtained showed that for ISS and ITU modeling, only perceived ease of use, system features, response time, flexibility, timeliness, accuracy, responsiveness and user training positively influenced the intention to use. However, for the TAM and ITU modeling, only TAM's measures such as timely information, efficiency, increased transparency, and proper patient identification had a positive effect on intension to use. The ISS and US modeling revealed that perceived ease of use had the greatest impact on user satisfaction while response time had the least effect on user satisfaction. On its part, the TAM and US modeling showed that timely information, effectiveness, consistency, enhanced communication, and proper patients identification had a positive influence on user satisfaction.

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1. Introduction

Information assurance refers to the process of protecting data in electronic healthcare records system. Information assurances are the measures that are tailored for the protection of patient information in the healthcare organization process. According to [1], however, information assurance may involve responsibilities, coverage, and accountability of security professionals. It may also incorporate proactive as well as defensive procedures geared towards protecting information. Device interconnectivity and ubiquitous computing have continued to penetrate the healthcare sector. This has seen the rise in the development of technologies such as Medical Internet of Things (MIoT), which is also referred to as or Internet of Healthcare Things (IoHT), or Internet of Medical Things (IoMT). As discussed in [2], these technologies play a major role in the healthcare sector and hence the well-being of billions of people across the globe. It is explained in [3] that owing to the ubiquity of internetworking technologies such as MIoT, wireless implanted medical devices have gained increase in usage, application and complexity. One of the key drivers of the MIoT devices is their ability to monitor patients remotely. Unfortunately, this requires remote connectivity which with rapid growth in usage and complexity lead to increased threat of cyber security attacks [4]. Apart from these technologies, a number of repositories of information concerning the health status of the patients do exist. These repositories are collectively referred to as health information systems (HISs) and according to [5], they are created and managed in digital formats. The patients' records in this regards contains medical history including operations, hospitalizations, medications, laboratory results and relevant health care information.

Hospital Information System (HIS) is a class of health information systems widely utilized in clinical settings and according to [6], establishing the success rate of HISs is an ongoing research area. This is because its implications are of interest for researchers, physicians and managers. Healthcare information technology serves to bring forth reduction of healthcare costs as well as enhancements of its quality. As explained in [7], the deployment of information technology coupled with E-health is one of the underpinning developments geared towards open governance. For instance, blockchain technology (BC) has been deployed to facilitate safe delivery and secure management of healthcare data. The BC technology can also boost secure data sharing which can potentially reform the conventional healthcare practices. Ultimately, this can render healthcare more reliable and effective. As discussed in [8], proposals are being made for the block chain technology to be deployed for personalized healthcare administration.

BC primarily exhibits six key elements that make it attractive in HIS. These features include immutability, transparency, decentralization, autonomy, anonymity and being open source. As such, authors in [9] point out that there has been growing interest in employing the BC technology for safe and secure administration of healthcare. In addition, authors in [10] have proposed the deployment of this technology in biomedical while authors in [11] have suggested the deployment of BC to simulate the brain including thinking, and sharing of e-health data. Regarding medical data sharing, the BC technology can assure privacy and security as this data is transferred between clinical specialists and healthcare entities. In most health setups, healthcare data documentation has not been computerized, which renders this process ineffective and tiresome [12]. Efficient, accurate and cross validation checks as well as data retrieval are all possible from electronic health records system through automation of these procedures [13]. Authors in [14] point out that electronic data sharing among healthcare providers has led to the improvement of the healthcare services as well as reductions in clinical errors. To boost this electronic data sharing, information system standards play a key role [15,16].

This paper proposes information system success model with the attributes that can potentially curb the identified pitfalls of the current HIS. The main contributions of this paper include the following:

i. We investigate information system success (ISS) model dimensions that can enhance patient information assurance.
ii. Based on the identified information system success model dimensions, we model relationships among various Technology Acceptance Model (TAM) and ISS constructs.
iii. Depending on the correlation coefficients of the various paths, irrelevant constructs are eliminated to yield an enhanced ISS model for patient information assurance.

The rest of this paper is organized as follows: section II presents related work while section III gives an outline of the adopted methodology. On the other hand, section IV presents and discusses the modeling results. Finally, section V concludes the paper and gives future directions.

2. Related Work

A number of HIS technologies have been deployed in the healthcare sector, such as Electronic health (e-health), Medical Internet of Things (MIoT), Internet of Medical Things (IoMT, Internet of Healthcare Things (IoHT), and more recently, the blockchain (BC) enabled HISs. As poined out in [17], electronic medical records (EMR) system

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usability is a major healthcare informatics issue owing to lack of standard user interfaces. In addition, patient harm as a result of usability errors and user-unfriendly functionalities. Another challenge of HIS revolves around ethical and privacy issues. As explained in [18], data security remains a challenge in most HISs as most software applications have bugs that can be compromised. On their part, authors in [19] consider data standardization as a major obstacle, owing to its inadequacy.

Considering MIoTs, it is pointed out in [20] that their implementations are dogged with insecure networks, limitations of power, storage and memory capacity. This renders MIoT infrastructure vulnerable to cyber attacks. Authors in [21] elaborate that to offer healthcare that is tailored to particular patients, unique identifiers should be developed to facilitate easy identification of patients and their healthcare data among various healthcare providers. However, majority of healthcare facilities lack this unique patient identifier that operates across multiple hospitals information systems such as HIS. On the other hand, authors in [22] discuss that soaring technological costs for healthcare technologies, resistance to embrace technology among shareholders, lack of standardization during data gathering and processing, privacy and security of patients' information are some of the factors that impede HIS implementation. The electronic healthcare records information has several implications in the decision making process in patient care and health policies. According to [16], the privacy and security of patients' digitized records is very key for the adoption of HIS. On the other hand, authors in [23] have identified resistance to technology adoption by physicians as being a hindrance towards automated healthcare provision. In addition, fear of potential misuse of patients' records by medical officers has been cited in [24] as being critical setback towards HER implementation.

To address some of the information assurance issues, authors in [25] have developed an Ethereum protocol based private BC for safe and secure use of remotely accessed patient data. Similarly, author in [26] has proposed a public BC for encryption, whose goal is to secure health data storage. On the other hand, an integrated BC approach for patient data sharing and management has been presented in [27]. Using this scheme, safe and secure storage and exchange of personal patient medical data is possible. On the other hand, authors in [28] have proposed a framework that facilitates automated evaluation of patients' healthcare status. On their part, authors in [29] have implemented a platform for healthcare information exchange. This scheme achieves both authenticity and privacy during patient electronic data exchange among various HIS platforms. In addition, a systematic and innovative architecture capable of not only protecting classified patient records but also address major privacy and security issues in patients' data has been developed in [30]. Similarly, a remote healthcare framework for monitoring, diagnosis and treatment of cancer tumors has been introduced in [31]. To achieve this goal, smart contracts were utilized.

3. Methodology

Based on the identified challenges of healthcare patient information assurance and the dimensions of information system success model, this research purposively adopted both ISS and TAM. In this regard, TAM was selected owing to its ability to offer theoretical underpinnings for technology adoption. On the other hand, ISS was chosen due to its ability to effectively technological features such as information quality, system quality and service quality to the adoption of various systems. As pointed out in [32], ISS serves to theoretically explain and estimate system usage as well as the underlying success factors.

3.1 Target Population and Sampling

This research targeted 5 healthcare facilities with 221 staff within Homabay County, Kenya. Included in the study are 60 data clerks, 40 healthcare records officers, 30 nursing officers, 71 clinical officers and 20 medical officers. This gives an approximate target population of 221 respondents as shown in Table 1.

Table 1. Target Population

Group	Target Population
Data Clerks	60
Health Records officers (HRIOS)	40
Nursing Officers	30
Clinical Officer	71
Medical Officers (Doctor)	20
Total	**221**

The sample size was obtained based on the Conhrans formula which allows the researcher to derive an appropriate sample size based on some required precision, confidence level and the probable proportion of the features that are inherent in the population.

$$n = \frac{n_0}{1 + \frac{(n_0 - 1)}{N}}$$

Where:

n_0 = Is Cochran's sample size recommendation

N = Is the population size

n = Is the new, adjusted sample size

Where n_0 is obtained from:

$$\frac{Z^2 pq}{e^2}$$

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Here, e represents the desired level of precision, p is the proportion of the population which has the attribute in question, and q is (1 – p). On the other hand, z was obtained from the z-table. For a confidence level of 95%, the value of e=5%, giving a value of 1.96 for z. Then substituting these values in in the above formular gives the values in Table 2 below.

Table 2. Sample Size

Group	Target Population	Applied Sample size
Data Clerks	60	30
Health Records officers (HRIOS)	40	20
Nursing Officers	30	15
Clinical Officer	71	35
Medical Officers (Doctor)	20	10
Total	221	110

Based on the cumulative values for different target population proportion, the target population for this study was 221 respondents. As such, the next task was sampling during which the selection of members within each employees category to take part in the study was undertaken. After applying Cochran's formula, applied sample size was obtained for each category of employees, whose total was 110 as shown in Table 2. As such, this research utilized a sample size of 110 respondents who were then provided with the questionnaires. Within each employee applied sample size stratum, a simple random sampling was employed to select study respondents.

3.2 Reliability of Research Instrument

In this paper, Cronbach's Alpha was employed to evaluate the reliability of the questionnaire that was utilized for data collection. To achieve this, reliability coefficient was computed for all the variables under study. It was noted that Cronbach's Alpha lay between 0 and unity (1), where a coefficient of zero pointed to the questionnaire's lack internal consistency. On the other hand, a coefficient of unity (1) implied complete internal consistency of the employed questionnaire. Theoretically, a reliability coefficient of 0.7 or more is regarded as being sufficient.

3.3 Proposed Enhanced ISS Model for Patient Information Assurance

Although many models have been proposed to explain and predict the use of a system, the Information System Success model was designed to determine the factors most important in successful adoption of a new system in line with information assurance. Based on the responses obtained, Figure 1 shows the proposed enhanced ISS model for patient information assurance. As shown in Figure 1, system quality, information quality and service quality were all constructs from the ISS while perceived usefulness and perceived ease of use were constructs from the TAM. Both ISS and TAM constructs were hypothesized to influence both the intention to use (ITU) and user satisfaction (US). On its part, user satisfaction was hypothesized to have an influence on the intention to use.

In this research, system quality was measured using perceived ease of use (PEOU), system features (SF), response time (RT) and flexibility (FL). On the other hand, information quality was measured using timeliness (TM), accuracy (AC), and trustworthiness (TW). Service quality was gauged using assurance (AS), responsiveness (RP) and user training (UT).

Regarding TAM, timely information (TI), accurate information (AI), effectiveness (ESS), efficiency (EFF), consistency (CSS), relevance (RL), enhanced communication (EC), increased accountability (IA), increased transparency (IT), proper patients identification (PPI), cost reduction (CR) and data security (DS)all measured perceived usefulness while perceived ease of use was measured using user friendliness (UF), standard user interfaces (SUI), workflow compatibility (WC) and interoperability (INT). Figure 2 shows the relationships among the intention to use (ITU) constructs.

As shown in Figure 2, the ISS model constructs were ten (10) which included PEOU, SF,RT, FL, TM, AC, TW, AS, RP, and UT. In this case, these ten constructs were measurable variables while ITU was latent variable.

The straight lines emanating from measurable variables and moving towards the latent variable represented the correlation coefficients. Further, Figure 2 shows that TAM had sixteen measurable variables which included TI, AI, ESS, EFF, CS, RL, EC, IA, IT, PPI, CR, DS, UF, SUI, WC, and INT. From Figure 1, the same constructs that measured ITU also measured user satisfaction (US) as shown in Figure 3. As shown here, the ISS model constructs were ten (10) which included PEOU, SF,RT, FL, TM, AC, TW, AS, RP, and UT. In this case, these ten constructs were measurable variables while ITU was latent variable. As was the case for ITU, the straight lines emanating from measurable variables and moving towards the latent variable represented the correlation coefficients. Further, Figure 3 shows that TAM had sixteen measurable variables which included TI, AI, ESS, EFF, CS, RL, EC, IA, IT, PPI, CR, DS, UF, SUI, WC, and INT.

Based on the values of the correlation coefficients,

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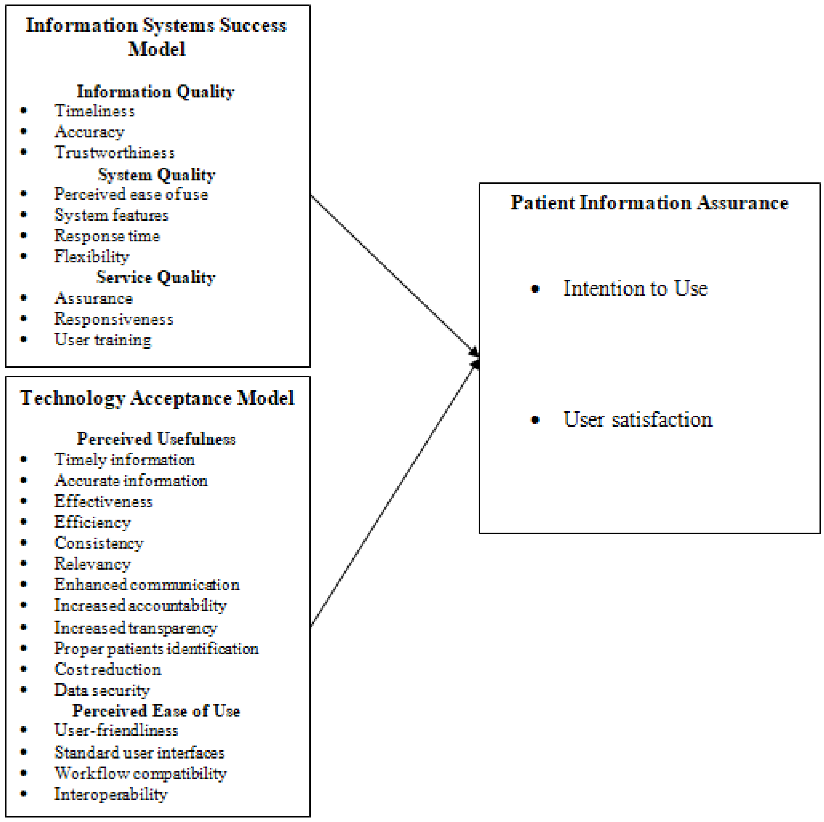

Figure 1. Proposed Enhanced ISS Model for Patient Information Assurance

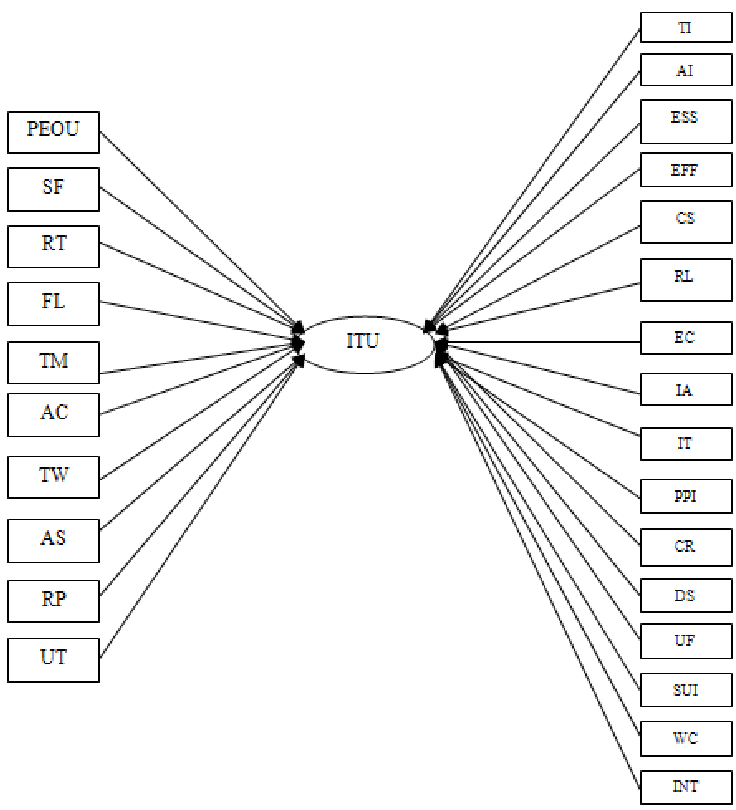

Figure 2. Intention to Use Constructs

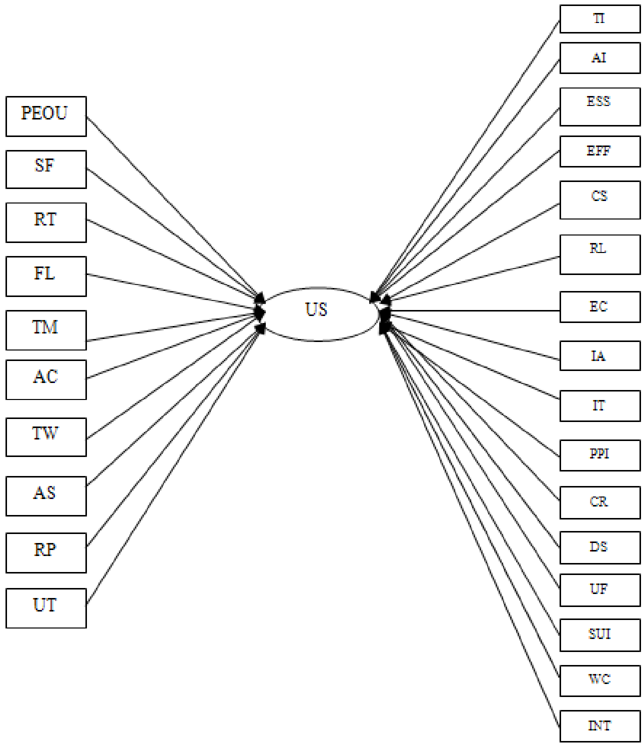

Figure 3. User Satisfaction Constructs

some of these variables were dropped while others were adopted. The criteria for variable rejection or adoption were based on the cut-off correlation coefficient of 0.5, below which the construct was a candidate for elimination while above which the construct was a candidate for adoption. Here, the final model then consisted of the adopted constructs for both ITU and US as elaborated in section IV.

4. Results and Discussion

The researcher distributed a total of 110 questionnaires out of which, 87 were returned. This represented 79.1% questionnaire return rate, which was well beyond the recommended 30%. The proposed enhanced information system success model for patient information assurance was modeled stepwise, including the Information Systems Success Model (ISS) and Intention to Use (ITU) modeling, TAM and ITU, ISS and user satisfaction (US), and finally TAM and US as discussed below.

4.1 Modeling ISS and ITU

In this modeling, the ITU was the latent variable while ISS constructs such as system quality measures (perceived ease of use -PEOU, system features -SF, response time-RT and flexibility -FL), information quality measures (timeliness -TM, accuracy -AC, and trustworthiness –TW, and service quality measures (assurance -AS, responsiveness –RP, and user training-UT) were the observed variables. Figure 4 shows the correlation coefficients between the ITU and the ISS observed variables. It is clear from Figure 4 that whereas some correlation coefficients were positive, and others were negative. For instance, ITU_PEOU, ITU_SF, ITU_RT, ITU_FL, ITU_TM, ITU_AC and ITU_RP and ITU_UT each had a positive correlation coefficient while ITU_TW and ITU_AS had negative correlation coefficients.

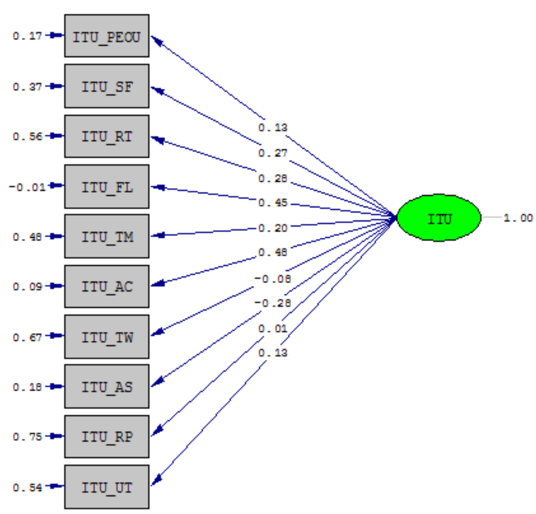

Figure 4. Modeling ISS and ITU

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Consequently, ITU_TW and ITU_AS were candidates for elimination. As such, only perceived ease of use, system features, response time, flexibility, timeliness, accuracy, responsiveness and user training positively influenced the intention to use. Whereas flexibility with a correlation coefficient of 0.48 had the highest influence, responsiveness with a correlation coefficient of 0.01 had the least influence.

4.2 Modeling TAM and ITU

In this modeling ITU was the latent variable while TAM's constructs such as timely information (TI), accurate information (AI), effectiveness (ESS), efficiency (EFF), consistency (CSS), relevance (RL), enhanced communication (EC), increased accountability (IA), increased transparency (IT), proper patients identification (PPI), cost reduction (CR) and data security (DS) all measured perceived usefulness while perceived ease of use was measured using user friendliness (UF), standard user interfaces (SUI), workflow compatibility (WC) and interoperability (INT) were observed variables. Figure 5 shows the correlation coefficients obtained.

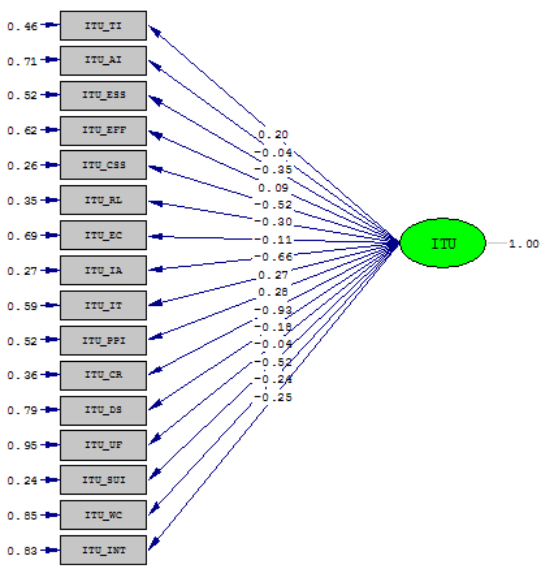

Figure 5. Modeling ITU and TAM

As shown in Figure 5, among the TAM's measures, some had positive while others had negative correlation coefficients. The PU measures that had negative correlation coefficients included ITU_INT, ITU_WC, ITU_SUI, ITU_UF, ITU_DS, ITU_CR, ITU_IA, ITU_EC, ITU_ITU_RL, ITU_CSS, ITU_ESS and ITU_AI. All these measures were therefore candidates for elimination. On the other hand, ITU_TI, ITU_EFF, ITU_IT, and ITU_PPI had a positive correlation coefficient. Whereas proper patients identification with correlation coefficient of 0.28 had the highest influence on intention to use, efficiency with a correlation coefficient of 0.09 had the least effect on intention to use. Consequently, only TAM's measures such as timely information, efficiency, increased transparency, and proper patient identification had a positive effect on intension to use.

4.3 Modeling ISS and US

To carry out this modeling, ISS measures such as such as system quality measures (perceived ease of use -PEOU, system features-SF, response time-RT and flexibility -FL), information quality measures (timeliness -TM, accuracy -AC, and trustworthiness –TW, and service quality measures (assurance -AS, responsiveness –RP, and user training-UT) were the observed variables while US was the latent variable. Figure 6 shows the correlation coefficients between the US and the ISS observed variables.

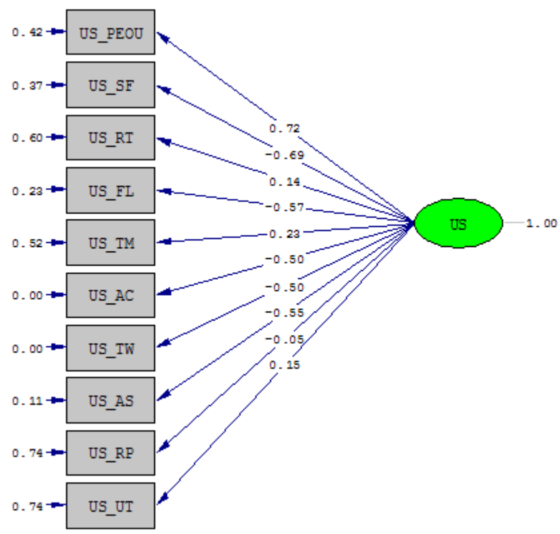

Figure 6. Modeling ISS and US

It is clear from Figure 6 that US_SF, US_FL, US_AC, US_TW, US_AS, and US_RP had negative correlation coefficients and hence were eliminated. On the other hand, US_PEOU, US_RT, US_TM, and US_UT had positive correlation coefficients and were retained. Whereas perceived ease of use with a correlation coefficient of 0.72 had the greatest impact on user satisfaction, response time with a correlation coefficient of 0.14 had the least effect on user satisfaction.

4.4 Modeling TAM's and US

In this modeling, US acted as the latent variable while TAM's measures such as such as timely information (TI), accurate information (AI), effectiveness (ESS), efficiency (EFF), consistency (CSS), relevance (RL), enhanced communication (EC), increased accountability (IA), increased transparency (IT), proper patients identification (PPI), cost reduction (CR) and data security (DS) all measured perceived usefulness while perceived ease of use was measured using user friendliness (UF), standard user interfaces (SUI), workflow compatibility (WC) and interoperability (INT) were observed variables. Figure 7 shows the correlation coefficients between the US and the TAM's PU observed variables.

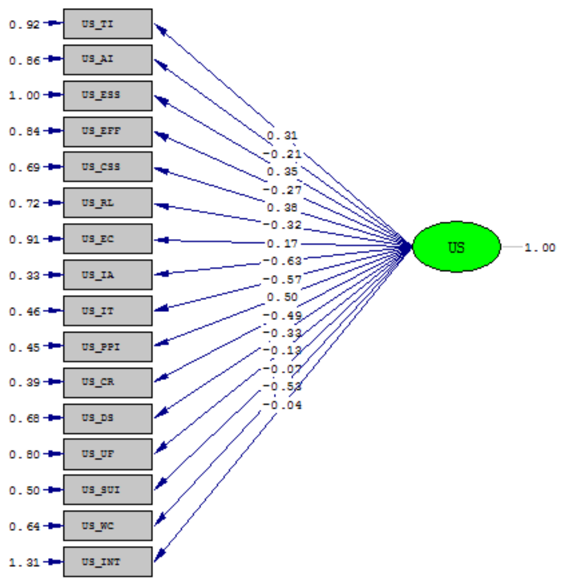

Figure 7. Modeling TAM and US

As shown in Figure 7, US_AI, US_EFF, US_RL, US_IA, US_IT, US_CR, US_DS, US_UF, US_SUI, US_WC, and US_INT had negative correlation coefficients and hence were candidates for elimination. On the other hand, US_TI, US_ESS, US_CSS, US_EC, and US_PPI had positive correlation coefficients. As such, timely information, effectiveness, consistency, enhanced communication, and proper patients' identification had a positive influence on user satisfaction. Among these positive effectors, proper patients' identification with a correlation coefficient of 0.38 had the largest impact on user satisfaction while enhanced communication with a correlation coefficient of 0.17 had the least influence on user satisfaction. Table 3 presents the adopted constructs for each of the modeling that was carried out.

It is clear from Table 3 that US_PEOU had the largest correlation coefficient while ITU_RP had the least correlation coefficient. In addition, ITU_PEOU had the same correlation coefficient as that of ITU_UT. Similarly, ITU_TM had the same correlation coefficient as that of ITU_TI. A similar observation can be made for ITU_IT and ITU_SF, and also for ITU_RT and ITU_PPI. To arrive at the final model, the adopted constructs in Table 3 were again re-modeled. Figure 8 shows the combined modeling of ITU against ISS and TAM.

Table 3. Adopted Constructs and their Correlation Coefficients

Modeling	Adopted Constructs	Correlation Coefficients
ISS and ITU	ITU_PEOU	0.13
	ITU_SF	0.27
	ITU_RT	0.28
	ITU_FL	0.45
	ITU_TM	0.20
	ITU_AC	0.48
	ITU_RP	0.01
	ITU_UT	0.13
TAM and ITU	ITU_TI	0.20
	ITU_EFF	0.09
	ITU_IT	0.27
	ITU_PPI	0.28
ISS and US	US_PEOU	0.72
	US_RT	0.14
	US_TM	0.23
	US_UT	0.15
TAM and US	US_TI	0.31
	US_ESS	0.35
	US_CSS	0.38
	US_EC	0.17
	US_PPI	0.50

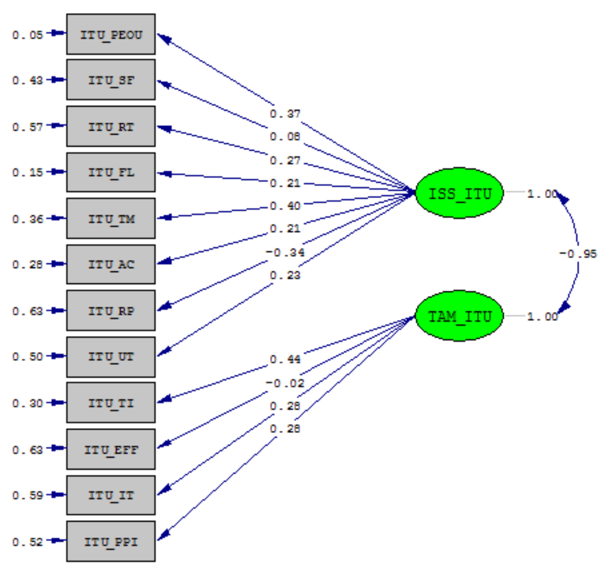

Figure 8. Semi-Attuned TAM-ISS

As shown in Figure 8, all the ISS measures were positively correlated except ITU_RP. For the case of TAM, all the measures were positively correlated except ITU_EFF. As such, these two measures were eliminated

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and the modeling executed again to yield the model shown in Figure 9. It is clear from Figure 9 that all the correlations coefficients are now positive.

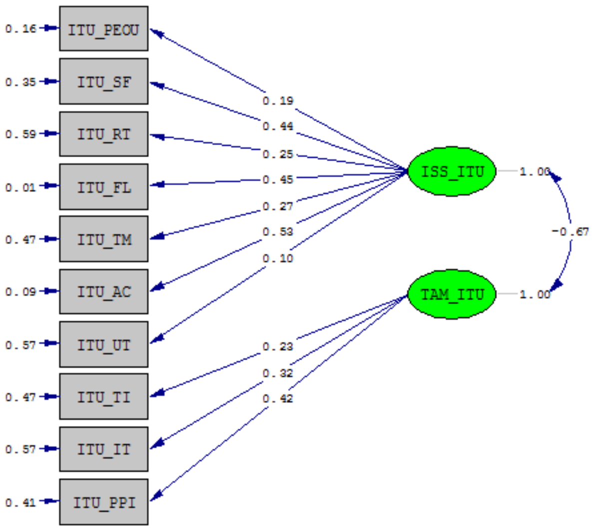

Figure 9. Attuned TAM-ISS

A similar procedure was repeated for TAM-US by running the combined modeling of US against TAM and ISS. As shown in Figure 10, all the correlation coefficients were positive, hence there was no need to attune this model further.

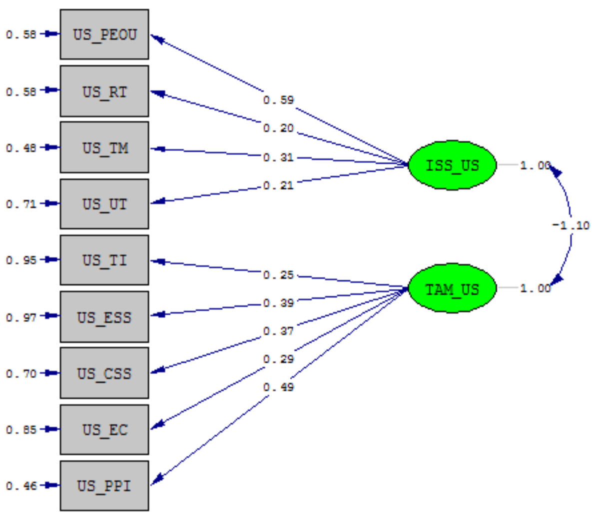

Figure 10. Attuned TAM-US

Based on the attuned models of Figure 9 and Figure 10, the final model developed in this research is shown in Figure 11. It is evident from Figure 11 that the ISS' system quality, information quality and service quality all affected intension to use as well as user satisfaction. For instance, perceived ease of use influenced both intention to use and user satisfaction. However, based on the correlation coefficient values, then its influence on user satisfaction with a coefficient of 0.59 was greater than its influence on intention to use which had a coefficient of 0.19. Regarding the effect of response time on both intentions to use and user satisfaction, the correlation coefficient of 0.25 for intention to use was greater than that of 0.20 for user satisfaction. As such, response time had more effect on intention to use than user satisfaction.

Similarly, timeliness had more influence (correlation coefficient of 0.31) on user satisfaction that on intention to use (correlation coefficient of 0.27); user training had more influence (correlation coefficient of 0.21) on user satisfaction that on intention to use (correlation coefficient of 0.10); timely information had more influence (correlation coefficient of 0.25) on user satisfaction that on intention to use (correlation coefficient of 0.22); and proper patient identification had more influence (correlation coefficient of 0.49) on user satisfaction that on intention to use (correlation coefficient of 0.42).

Regarding the reliability of the research tool, its assessment was carried out using Cronbach' alpha as shown in Appendix I. It is clear from Appendix I that, out of the 52 observed variables, only one variable (ITU Cost reduction) loaded lower than the threshold Cronbach's alpha of 0.7. Among the variables with Cronbach's alpha above 0.7, the least value was 0.723 while the highest value was 0.799. Consequently, the questionnaire used measured what it was actually supposed to measure and hence the results obtained are reliable.

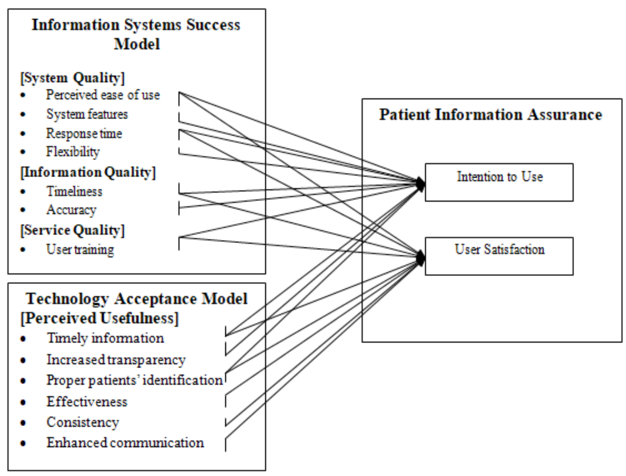

Figure 11. Proposed Enhanced ISS Model

5. Conclusions

The aim of this paper is to develop an enhanced information system success model for patient information assurance was modeled stepwise. This involved modelling a combination of Information Systems Success Model (ISS) and Intention to Use (ITU), TAM and ITU, ISS and user satisfaction (US), and finally TAM and US. For the ISS and ITU modeling, only perceived ease of use, system features, response time, flexibility, timeliness, accuracy, responsiveness and user training positively influenced the intention to use. However, for the TAM and ITU modeling, only TAM's measures such as timely information, efficiency, increased transparency, and proper patient identification had a positive effect on intension to use. The ISS and US modeling revealed that perceived ease of use had the greatest impact on user satisfaction while response time had the least effect on user satisfaction. On its part, the TM and US modeling showed that timely information, effectiveness, consistency, enhanced communication, and proper patients identification had a positive influence on user satisfaction. The study findings are recommended to the decision makers of the healthcare system. This is due to potentiality of helping them understand the factors that may facilitate the development of enhanced information systems success model in their health facilities that will ultimately boost information assurance.

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Appendix I: Cronbach's Alpha for Observed Variables

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
ITU Perceived Ease of use	94.93	43.065	.630	.741
ITU System Features	94.44	43.388	.572	.743
ITU Response Time	94.93	43.065	.630	.741
ITU Flexibility	93.44	43.388	.572	.743
ITU Timeliness	94.93	43.065	.630	.741
ITU Accuracy	93.44	43.388	.572	.743
ITU Trustworthiness	94.44	51.063	-.701	.785
ITU Assurance	92.68	53.965	-.994	.799
ITU Responsiveness	94.44	51.063	-.701	.785
ITU User Training	94.93	43.065	.630	.741
ITU Timely Information	94.44	51.063	-.701	.785
ITU Accurate Information	94.93	50.739	-.652	.783
ITU Effectiveness	94.93	43.065	.630	.741
ITU Efficiency	94.93	50.739	-.652	.783

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
ITU Consistency	93.69	40.286	.992	.723
ITU Relevance	94.69	40.286	.992	.723
ITU Enhanced Communication	94.93	43.065	.630	.741
ITU Increased Accountability	92.69	40.286	.992	.723
ITU Increased Transparency	93.44	51.063	-.701	.785
ITU Proper Patients Identification	94.68	53.965	-.994	.799
ITU Cost Reduction	93.20	34.206	.991	.693
ITU Data Security	94.69	40.286	.992	.723
ITU User Friendliness	94.69	40.286	.992	.723
ITU Standard User Interfaces	93.69	40.286	.992	.723
ITU Workflow Compatibility	94.69	40.286	.992	.723
ITU Interoperability	94.69	40.286	.992	.723
US Perceived Ease of use	94.69	40.286	.992	.723
US System Features	94.68	53.965	-.994	.799
US Response Time	94.69	40.286	.992	.723
US Flexibility	93.68	53.965	-.994	.799
US Timeliness	94.69	40.286	.992	.723
US Accuracy	93.68	53.965	-.994	.799
US Trustworthiness	94.68	53.965	-.994	.799
US Assurance	92.68	53.965	-.994	.799
US Responsiveness	94.68	53.965	-.994	.799
US User Training	94.69	40.286	.992	.723
US Timely Information	94.68	53.965	-.994	.799
US Accurate Information	94.69	40.286	.992	.723
US Effectiveness	95.18	46.873	.000	.760
US Efficiency	94.69	40.286	.992	.723
US Consistency	94.68	53.965	-.994	.799
US Relevance	94.69	40.286	.992	.723
US Enhanced Communication	95.18	46.873	.000	.760
US Increased Accountability	92.69	40.286	.992	.723
US Increased Transparency	92.69	40.286	.992	.723
US Proper Patients Identification	94.68	53.965	-.994	.799
US Cost Reduction	93.69	40.286	.992	.723
US Data Security	94.69	40.286	.992	.723
US User Friendliness	94.69	40.286	.992	.723
US Standard User Interfaces	94.18	46.873	.000	.760
US Workflow Compatibility	94.69	40.286	.992	.723
US Interoperability	95.18	46.873	.000	.760

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