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THE MODERATING EFFECT OF USER INVOLVEMENT ON USER SATISFACTION ENABLERS OF HUMAN RESOURCE MANAGEMENT SYSTEM

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ABSTRACT

This study aims to discuss the moderating variables namely user involvement (UI) in the information system user satisfaction – individual benefits relationship. The purpose of this study to overcome the shortcomings in understanding information system (IS) user satisfaction among public sector employees. The totals of 250 public sector operational employees of Human Resource Management Information System (HRMIS) in Kedah, Malaysia were used as sample for this study. Based on analysis and findings gathered through structural equation modeling (SEM), it can be concluded that UI had slightly moderate the relationship between user satisfaction and individual benefit. The results indicated strong support for UI in Malaysian public sector context, and also hinted strong and positive influenced proven in the previous studies for UI constructs. This study also will open new opportunities for those who want to further investigate information system success in Malaysian context.
Keywords: *DeLone and McLean, Information System, User Involvement, SEM-PLS, User Satisfaction*

1. INTRODUCTION

The IS act as main medium in Malaysian public sector; between services provided by an organization and citizens to steer business process and they are the key to lead to the success or failure of an organization in public sector [8]. According to [8], level of IS can be divided into three categories of employees; strategic employees, managerial employees and operational employees. These category of employees have different type of IS and each IS specifically designed and developed to cater multi-functions of job specifications especially in public sector. The IS are characterized by routine based applications to periodically based applications. For example, IS at operational level are characterized as routine based or transaction based and this group of people need high job concentration because of dealing with tons of data and usually operating in a current time frame [8]. Top level managements are relying on operational workers to summarize data in decision making process [16]. Operational employees represent biggest portion in Malaysian public sector employees and according to Malaysian Labor Force Survey Report 2012 which is 697,600 or 5.5% are employed in public administrative in 2012.

We define user involvement (UI) in this paper as the as user engagement which combined user participation (the behavior) and user involvement (the attitude), borrowing the definition from [24]. In order to further understand the role of UI on user satisfaction, multiple constructs were considered namely US enablers. US enablers consists of system quality, information quality, service quality together with technostress are commonly used to measure user satisfaction. These quality factors were found to be the most widely used surrogate of user satisfaction in IS. This study aims to focus on how the effect of UI on HRMIS usage in Kedah, Malaysia. This study targets several benefits. First, to understand the role of UI as a whole in IS process development. Therefore, this study would orient IS developers on how to involve user actively to ensure the delivered IS is optimize and worthwhile. Second, to create

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balance in communication between IS developers and IS user, since there were thoughts that assumed much participation from the user would distract the development process. Third, to overcome the government reputation in providing IS applications to serve community needs because in recent years there were many complaints regarding government applications such as SAPS, THIS, MySiKAP which contributed to user dissatisfaction. Section 2 discusses the relevant literature review on IS/IT acceptance, the foundation of the research model, and the current state of IS/IT in the Arab world. Section 3 introduces the proposed research model. Section 4 presents the research methodology. Section 4 describes the results and their implications while the last section, Section 5, summarizes the findings and points out future works directions.

2. STUDY BACKGROUND AND LITERATURE REVIEW

2.1 Study Background

The Malaysian public sector has a strong start to moving forward in successful implementation and deployment of ICT in government agencies. Government Chief Information Officer (GCIO) was appointed in 2008 under MAMPU to coordinate policies and legislation among government agencies. The main responsibilities for GCIO are to ensure infrastructure and standards are applied to enabled ICT services provided, so that operation cost can be controlled and uniformity among government agencies. Software development approaches can be divided into System Development Life Cycle (SDLC) method and agile method. Most developers choose agile method in developing IS due to can gain rapid client feedback, good communication between clients and developers, fast outcome, continuous attention between technical team and clients and can accommodate for late changes in requirements. But, sometimes SDLC method is favorable when IS project is at large scale due to effort estimation, proper documentation and designation, improve project tracking and for better decision making. User involvement in IS development occurred at several stage such as early phases (gathering requirements phase and use cases), intermediate phase (user interface design, unit testing) and implementation phase (training and support). If user involvement processes do not occurred or lacked in any phases stated above, the tendency of IS project will fail is high [27].

As for MAMPU, there are no standard mechanisms to monitor level of user involvement or participation in each IS development project. Project Monitoring System II (SPP II) was established as a web based tool to facilitate the Ministry/Agency to record and monitor development projects less than 5 years. By using SPP II, projects' progress can easily be monitored, but it does not provide detailed information regarding user involvement. For out-sourced IS projects, appointed companies have full authority to control the progress of the project without interference from other parties, in addition they only need to update the status of project's progress to MAMPU periodically. On top of that, MAMPU also entrusted outsourced companies to run the project as long the project can be completed within timeframe. As a conclusion, every outsourced company has their own approaches and policies in participating the user in there is projects. There are cases where IS user only participating in the beginning or in gathering requirement phase, but not getting involved at almost every project stage. The IS user are needed to do system testing at system acceptance test without fully aware IS capabilities in terms of systems' functions, interfaces and processes. The situation could lead from bad to worse when IS user need to learn how to use the IS based on developers' perception, but not from their thoughts.

2.2 Literature Review

The review of literature begins in the early 80's when [2] studied the impact of user involvement on information satisfaction and that was an earlier attempt for improving system quality and ensuring successful IS implementation. Based on user satisfaction instrument developed by [1] used in the study, the results demonstrate that user involvement was proven significant to lead greater system usage and user satisfaction in IS. Since then, user involvement become vital role in measuring IS user satisfaction, for example the studies made by [9], [10], [12] and [16] proved that when user are involved in IS development activities, outcome of the IS are more acceptable and satisfied in terms of user satisfaction and usefulness.

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To draw attention why user involvement is important construct, the past research shown great interest in using user involvement as one of the predictor to measure IS success and user satisfaction. User involvement is used to increase acceptance of an IS and it concerns to develop realistic expectations of the system, provides guideline between development team and the users, and increases system ownership by the user [1]; [17]. The issue between developer involved the IS user too little, is a primary concern why the user remains unsatisfied with the current IS [1]. The similar studies also revealed low user involvement suggests that IS developer believe IS users does not have too much involve in providing input to a technical problem [2]; [16]. Their findings show that the developer who worked within the same project viewed the user involvement as unhelpful and insignificant. Meanwhile, a study by ComputerWeekly.com joined with Oxford University in 2003 revealed user involvement was at top three in most common risk factor ranking in IS failure. The study indicates lack of client or end-user commitment may resulting to the IS failure especially when the product is delivered to the user. In a separate study, [15] has defined what it takes for success of an IS. In his study namely CHAOS study suggested commitment from users is ranked as most important after top management support as for improvement factors.

[19] and [18] also emphasized user involvement can play role as moderator to the user satisfaction especially at early stages (e.g. system requirement definition). Their study covers the obstacles and benefits of user involvement from past researchers and a key finding revealed that through developer's experience, they will get more accurate user requirements by involving users. This in line with findings by [27] also highlighted the importance of user involvement at early stages. [27] in their work of system design and development, shown lacking of engagement of customers in system development life cycle (SDLC) could lead to discontentment with the IS. This statement indicates that user involvement had influence on IS user satisfaction. However, [23] finds user involvement is a not good predictor that can lead user satisfaction and IS usage. Meanwhile, the notion of user involvement used as moderator inspired by suggestion from [27]. She emphasized the role of user involvement can be diversified either as moderator or mediator that lead to user satisfaction. These studies have been useful in shedding light in understanding the relationship of user involvement and user satisfaction in IS development. The main concern of this study is to understand is it user involvement have positive influence on IS user satisfaction. Since this study considers only mandatory environment on IS usage, so the use construct is eliminated.

3. RESEARCH MODEL AND HYPOTHESES

3.1 The research model

The research model (Figure 2) provides the theoretical ground of the study. This model is motivated by the DeLone and McLean IS success model (Figure 1) with some modifications is made regarding it constructs to fit the purpose of this study. The model investigates the relationship between seven variables. These variables were included based on a review of past IS/IT literature related to user satisfaction in IS measurement. The included variables are system quality, information quality, technology stress, service quality, user involvement, IS user satisfaction and net benefits. Independent variables (IV) in the model are grouped as User satisfaction enablers which are system quality, information quality, technology stress and service quality. The net benefits will represent as dependent variable (DV) in the proposed research model. Meanwhile, user involvement is proposed to moderate the relationship between IS user satisfaction and net benefits.

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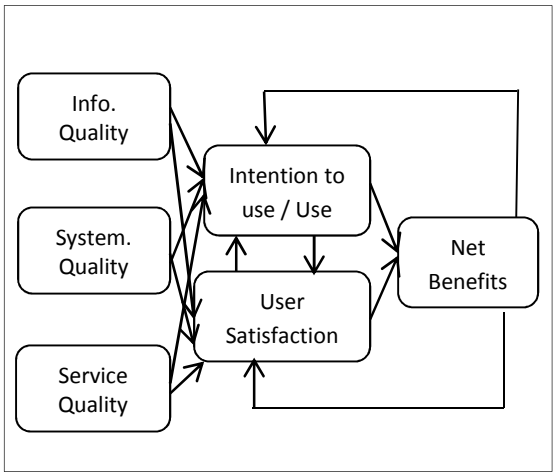

Figure 1:DeLone and McLean IS Success Model

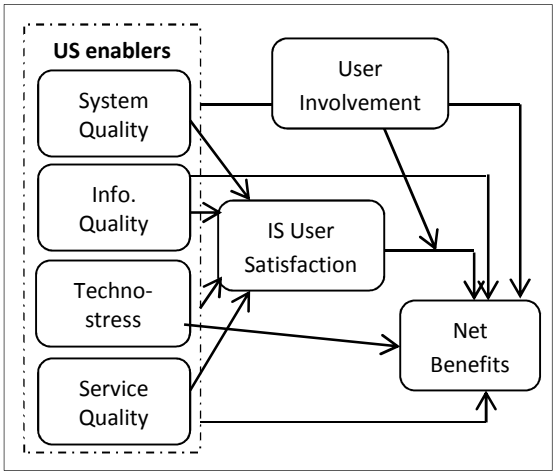

Figure 2: Proposed Research Model

3.2 Hypotheses

A set of hypotheses is proposed for each of the construct in the model as stated below and shown in the proposed research model. The relationship behind each hypothesis is shown below and is supported by previous literature.

H1: System Quality – IS User Satisfaction
System quality is positively associated with IS user satisfaction. [10][15][39]

H2: System Quality – Net Benefits
System quality is positively associated with net benefits. [15]

H3: Information Quality – IS User Satisfaction
System quality is positively associated with IS user satisfaction. [10][15]

H4: Information Quality – Net Benefits
System quality is positively associated with net benefits. [10][15]

H5: Technostress – IS User Satisfaction
Technostress is positively associated with IS user satisfaction. [35][36]

H6: Technostress – Net Benefits
Technostress is positively associated with net benefits. [35][36]

H7: Service Quality – IS User Satisfaction
System quality is positively associated with IS user satisfaction. [15][10]

H8: Service Quality – Net Benefits
System quality is positively associated with net benefits. [15][39]

H9: IS User Satisfaction – Net Benefits
IS User Satisfaction is positively associated with net benefits. [10][39]

H10: User Involvement
The relationship between IS user satisfaction and net benefits is moderate by user involvement. [10]

4. RESEARCH METHOD

The survey instrument consists of a structured questionnaire was developed to measure individuals' perceptions of user involvement on IS user satisfaction. The totals of 250 public sector operational employees of Human Resource Management Information System (HRMIS) in Kedah, Malaysia were used as sample for this study. In constructing this research model, the authors followed a process of fourth steps. First, existing literature on user involvement, user satisfaction and IS success was thoroughly reviewed. Second, based on literature review the questionnaire items were review and sorted to match the study purposes, third the meeting with IS/IT managers in public sector department in Kedah was held to obtain view and thoughts regarding the selected items which will be used in survey. The study posited four independent variables which derived from DeLone and McLean IS success model (Figure 2). The selected variables were deemed most appropriate and measurable. Lastly, as for the

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purpose validity, the questionnaire was overviewed before it was sent out to make sure that the respondent would be able to understand and answer the questions. The instrument was reviewed by experts and academics with knowledge of survey design technique.

4.1 Measures

A questionnaire was designed reflecting the seven constructs of the research model. Items for measuring each construct were selected from prior studies. System Quality was assessed with 15 items from [32], Information Quality with 12 items also from [32], Technostress with 17 items was adopted from [36] and Service Quality with 12 items from [33], IS User Satisfaction with 6 items were based from [10] and [39]. Instrument of User Involvement with 11 items was adopted from [24] and finally, Net Benefits with 6 items was adopted from [12]. Items in the questionnaire were measured on a seven-point Likert scale ranging from (1) strongly agree to (7) strongly disagree. The summary for each construct is presented in Table 1 as shown below.

Table 1: Construct and Items Adopted for this Study

Construct	Items adopted from past literature
System Quality	[32]
Information Quality	[32]
Technostress	[36]
Service Quality	[33]
IS User Satisfaction	[10], [39]
User Involvement	[24]
Net Benefits	[12]

Questions related to characteristics of the respondents such as gender, age, experience, level of education and job title were also included in the questionnaire.

4.2 Sample and pilot study

The subjects in this study are employees at operational level of public sector organization in Kedah, Malaysia. Totally 250 respondents were participated in this study and focus groups are operational level workers who currently worked with HRMIS.

Pilot study was carried out to refine the questionnaire before it sent out to the actual respondents. Pilot test can minimize the potential problems in the pre-designed questionnaire such as feasibility, time, cost, adverse events and sample size issue to predict an appropriate sample size during a full-scale research project [28]. It is a potentially valuable source to rectify anything missing, so that can be added later to improve the chances of good outcome.

In the study, both academicians and practitioners were involved in the pilot test. The first two drafted questionnaire first was sent out to two research assistant in Universiti Utara Malaysia (UUM) to review the content of questionnaire in terms of structure, readability, completeness and suitable for study domain. The questionnaire was prepared in Malay to suit respondent profile, where most of them are coming from operational and support staff. After minor adjustment has been made, 60 questionnaires were distributed to public sector staff in Kedah covering federal government, ministry, state, local and district council. Based upon all the feedback received from pilot study, the items in the questionnaire were rephrased, corrected, changed and eliminated for better improvement. From the pilot test distribution, 60 questionnaires were used and 47 questionnaires (78.33%) were returned and only 40 (66.67%) usable questionnaire were used due to completion and meet the criteria. The respondents were reminded that the distributed questionnaire will be collected within two weeks.

4.3 Data collection

Total of 323 questionnaires were randomly distributed to public sector agency in Kedah, Malaysia. Generally, all departments in Malaysian public sector uses grade 17 to 32 to represent operational and support staff at different level, while ranging grade from 37 to 41 represent some of the professional staff. A list of public sector staff in Kedah state is retrieved from Public Service of Malaysia or known as Jabatan Perkhidmatan Awam (JPA). This is comprehensive list maintained and updated by JPA regularly. The record from the list was used and therefore there is confidence that the study used an updated list of HRMIS usage.

After one month, a total of 169 complete and usable questionnaires were returned. Two weeks time was given as first reminder to the respondents who still had not returned the survey. Then, next two weeks after the first

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reminder was sent there were 13 usable questionnaires returned and resulted 182 total completed questionnaires. A second reminder was sent to the respondents who still had not yet responded and one month time frame is given. After one month, only 87 questionnaires were returned but 68 were usable for the study. After following month, however, no more questionnaires were received, thus it can be concluded to stop follow up with the organization and proceed with data analysis. There are 250 out of 323 or 77.40% (Table 2) questionnaires were returned and usable for public sector in Kedah.

Table 2: Response Rate of the Questionnaire Distribution

Category	**Num. of organizations**
Ministry	5
State	4
Federal	7
Local	9
District Council	2

Num. of questionnaires sent	**Num. of returned questionnaires**	**Num. of usable questionnaires**
323	269 (83.28%)	250 (77.40%)

Early replies (1)	**Late replies (2)**	**Mean (1)**	**Mean (2)**
169	82	52.32%	25.39%

4.4 Data analysis

Structural equation model (SEM) technique was applied using PLS-SEM through the following steps: (1) specifying the measurement model; (2) identifying the measurement model; (3) data cleaning and dimension reduction; (4) path model estimation; (5) assessment of the results and (6) assessment the structural model.

The first step is specifying the measurement model as shown in Figure 3. Then, the type of the model was identified. As for this study, the type of the model is reflective type (Figure 4) and conceptually, a reflective measurement model happens when the indicators of a construct are considered to be caused by the construct. Next, outer loadings test was performed to ensure indicator reliability of each constructs connected to it variable. Total, 80 indicators or items from the questionnaire were used and 12 items were deleted because they do not satisfy the criteria stated by [18]. Item with outer loading in between 0.4 to 0.7 are considered to be removed because it will influence the value of average variance extracted (AVE) and validity.

4.5 Convergent and discriminant validity

In PLS, validity is assessed by using convergent and discriminant validity. Convergent validity (CV) is the measurement to what extent to which a measure correlates positively with the alternatives measures of the same construct. In other words, CV signifies that measures that should be related are in reality related and share a high proportion of variance. To establish CV, the use of Average Variance Extracted (AVE) is needed and outer loadings of the indicators should be high (Table 3). AVE is the average amount of variance in indicator variables that a construct able to explain. An AVE value must at least 0.5 indicates sufficient CV, meaning that a latent variable is able to explain more than a half of its indicators on average. Outer loading relevance testing is carried out to determine which indicator should be retained or eliminated.

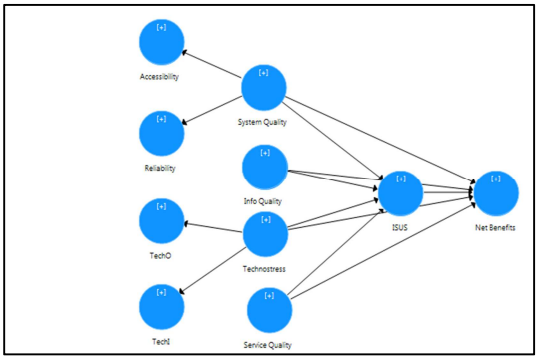

Figure 3: The Proposed Research Model

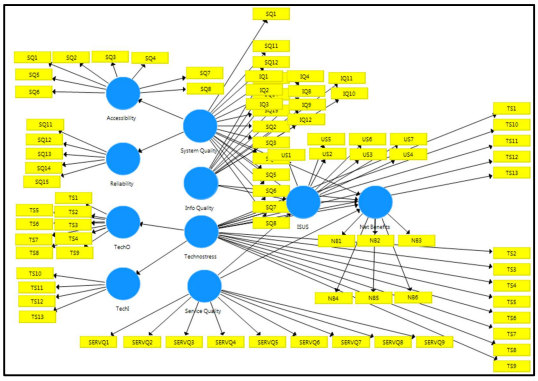

Figure 4: Reflective Type Model with Indicators

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The purpose of discriminant validity is to measure the extent to which a construct truly distinct from other constructs by empirical standards. It is done by examining the cross loading values in PLS algorithm and indicator outer loading on associated constructs should be greater than all of its loadings on other constructs

Table 3: Average Variance Extracted (AVE)

Construct	AVE
System Quality	0.576
• Accessibility	0.631
• Reliability	0.712
Information Quality	0.605
Technostress	0.723
• TechI	0.860
• TechO	0.786
Service Quality	0.711
ISUS	0.677
Net Benefits	0.676

As for discriminant validity, three tests must be accomplished which are Fornell Larcker, cross loadings and heterotrait-monotrait ratio (HTMT) as shown in Appendix 1. Based on the results from the tests, discriminant validity has been established.

After evaluation of the measurement model (step 5) has been carried out, result summary for the reflective measurement model is presented in Appendix 2.

4.6 Assessing PLS-SEM results of the structural model

It is very important to ensure the construct measures have been confirmed and valid in order to get reliable and valid judgment for the next analysis. There are five systematic procedures to be carried out to assess PLS-SEM structural model. These procedures involve collinearity assessment, assessing significance of the structural model and assessing R^2. The reason is that the estimation of path coefficients in the structural model is based on ordinary least square (OLS) regression for each latent variable [18].

After reliability and validity test for each construct of the measurement model were undertaken, this section continues by focusing on path analysis using PLS-Graph. It is carried out by testing each path in conceptual model proposed earlier to determine whether it is statistically significant or otherwise. Based on hypotheses have been proposed early in the study, the assessment also will account previous reported studies. For this purpose, bootstrapping option in SmartPLS 3 was run twice; without moderators and with moderators. Finally, to test the hypotheses, the *t*-value of the beta (B) path co-efficient was evaluated using a one-tailed test where a *t*-value lies 1.645 or greater at the confidence level of 0.05. The bootstrapping result is shown in Appendix 3.

Table 4: Collinearity Assessment

	ISUS	NB
ISUS		1.43
IQ	1.97	2.05
NB		
SERVQ	1.33	1.34
SQ	1.86	2.01
TS	1.27	1.27

**All VIF values < 5, so no collinearity exist.*

Table 5: Summary of the Test of the Study

Constructs		B	T-value	Sig.	Outcome
SQ -> ISUS	H1	0.322	4.540	YES	Support
SQ -> NB	H2	0.190	2.537	YES	Support
IQ -> ISUS	H3	0.240	3.342	YES	Support
IQ -> NB	H4	0.170	2.114	YES	Support
TS -> ISUS	H5	-0.004	*0.062*	NO	Reject
TS -> NB	H6	0.036	*0.729*	NO	Reject
SERVQ -> ISUS	H7	0.069	*1.151*	NO	Reject
SERVQ -> NB	H8	0.040	*0.652*	NO	Reject
ISUS -> NB	H9	0.330	4.739	YES	Support

1 tailed test at 0.05

4.7 Discussion of the Results

Based on summary of the results shown in Table 5, 9 hypotheses were proposed for the purpose of the study. The discussion begins with The results for the beta path co-efficient between SQ construct and ISUS construct (H1) is positive and statistically significant at the 0.05 level ($\beta = 0.322; t = 4.540$). This results in line with [27] and [20], who found strong support between the relationship SQ and ISUS (β = 0.54, $p < 0.05$). The results for H2 between SQ and NB also significant with ($\beta = 0.190; t = 2.537$) at $p < 0.05$. This finding is in line with [29] ($\beta = 0.73; p < 0.001$) and [12] ($\beta = 0.20; p < 0.05$). Even [12] was adopted TAM as based model, this study demonstrate significant

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findings for DeLone and McLean IS success model.

The co-efficient originating from H3, IQ to ISUS is positively and statistically significant ($\beta = 0.240; t = 3.342$) at p < 0.05. There are many past studies provide strong support between IQ to ISUS such as [12] ($\beta = 0.52; p < 0.01$) and [15] ($\beta = 0.30; p < 0.05$). The result also accounted for H4; demonstrate the relationship between IQ to NB with ($\beta = 0.170; t = 2.114$). This result supports a study from [4] in measuring IQ to decision-making satisfaction with ($\beta = 0.69; p < 0.01$). This result also in line with the work of [15], where significant findings had shown between IQ to perceived knowledge management system benefits ($\beta = 0.99; p < 0.01$).

Next, path co-efficient for H5; the relationship between TS and ISUS is not significant where ($\beta = -0.004; t = 0.062$). This result is in contrast with the work [23] where they had strong support result related to TS; (overload = 0.66, invasion = 0.67, complexity = 0.75, insecurity = 0.69 and uncertainty = 0.40) are significant at $p < 0.05$. However, a study from [23] had revealed different findings; TS was found to be negatively correlated with job satisfaction with (r= $-0.276; p < 0.05$). The result also shows a positive but not significant relationship for H6; between TS and NB with ($\beta = 0.036; p < 0.729$) and his finding also in line with the work of [23]. They also tested the relationship between TS and NB, namely organizational commitment and found TS also was negatively correlated with organizational commitment (r= $-0.269; p < 0.05$).

The relationship between SERVQ and ISUS (H7) also had shown positive but not significant ($\beta = 0.069; t = 1.151$) at p < 0.05. Same goes with the path for H8 between SERVQ and NB indicates not significant result where $t = 0.652$, even had positive relationship ($\beta = 0.040$). This result is in line with [28] which tested IS service function and user satisfaction (β = 0.391, $p < 0.05$). In contrast, the result of H8 is in line with [15] which resulted (β = 0.30, t = 2.76) at p < 0.05. Earlier than that, [26] also found insignificant relationship between SERVQ and NB at individual level and consistent with this study.

The results also indicate a positive and significant relationship between ISUS and NB for H9 ($\beta = 0.330; t = 4.739$). This is consistent with the study of [20] who found strong support in using user satisfaction to predict individual impact (β = 0.48, p <0.001). [17], who also made significant discovery between ISUS and NB (β = 0.360, $p < 0.001$). Earlier than that, [30] tested the hypothesis between user satisfaction and perceived individual impact and found positive results (β = 0.84, $p < 0.001$). ISUS continues as strong predictor to NB, while [37] (2002) also found significant findings between user satisfaction towards productivity and effectiveness (β = 0.35, $p < 0.01$).

4.8 Assessing the Level of R^2

In the next analysis, coefficient of determination (R^2) values is calculated to obtain predictive accuracy of the structural model. The R^2 is calculated as the squared correlation between a specific endogenous actual construct and predicted values. The value of coefficient represents the exogenous latent variables and the effect on the endogenous latent variables. the following R^2 values were generated; Reliability (82.1%), Accessibility (90.6%), Technology Overload (95.2%), Technology Invasion (77.7%), IS User Satisfaction (30.1%) and Net Benefits (34.1%). As for example, the R^2 value of Net Benefits is 0.341 and considers has a medium effect, which means that the conceptual model explains 34% of the variance in the construct.

4.9 The Moderating Effects of User Involvement

As suggested by [18], moderating and mediating variables supposed to be included after the assessment of structural model completed. In this study, the conceptual model with moderating variables is shown in Figure 5. By adding moderator variable, it can affect the strength of the relationship between two latent variables [18] and in this case ISUS and NB. As proposed in H10, the relationship between IS user satisfaction and net benefits is moderate by UI. Based on bootstrapping test (Figure 5), it is clearly shows positive and statistically significant result ($\beta = 0.136; t = 2.548$) for UI. This result can be interpreted as UI give positive effect on the relationship between ISUS and NB,

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while path co-efficient value from ISUS to NB is 0.279. If the UI becomes higher for the example increased by one standard deviation point, this would imply that the relationship between ISUS and NB would increase by the size of the interaction term and obtain the value of 0.279 + 0.136 = 0.415. The UI construct was found push the relationship between ISUS and NB. Meaning, when more UI from the IS user, the importance of one's IS satisfaction become more important for the explanation of the benefits of IS itself. UI gives positive impact to ISUS and NB (ISUS -> NB = 0.330), therefore UI strengthened the relationship between ISUS and NB. This result is in line with [2], when they tested the relationship between UI and ISUS for pre-development ($\beta = 0.75; p < 0.001$) and post implementation phases ($\beta = 0.31; p < 0.001$). The summary of the results for moderating variable is presented in Table 6.

Table 6: Summary of the Results for the Moderating Variables

Support/Rejection of moderating variables					
Mod		**B**	**T-value**	**Sig.**	**Outcome**
UI	H9	0.136	2.548	Yes	Support

5. DISCUSSIONS AND FUTURE WORKS

The objective of the conceptual model in this study was to situate the ISUS and NB of HRMIS based on theoretical and empirical DeLone and McLean IS Success Model. The findings have supported 5 out of 9 proposed hypotheses in main conceptual model as presented in Table 5. While, for moderating variables UI had clearly shown significant result between the relationship between ISUS and NB.

Overall, the findings have supported two US enablers factors (SQ and IQ) except TS and SERVQ, which not significant in predicting ISUS and NB. SQ and IQ resulted strong and positive impact in predicting ISUS and NB. The finding for TS in line with previous work of [35] which resulted not significant related to TS predicting the NB. Meanwhile, SERVQ found not significant in the study made by [6] and [29].

Based on respond of the survey, most employees in Malaysia public sector were agreed HRMIS absolutely benefited for them. According to the interview with several IT managers in public sector, clearly indicate that the use of HRMIS is mandatory which in line with one of the scope of the study. The employees must interact with HRMIS in order to perform tasks related to personnel, competency assessment and personal record management or in other words, there is no other way for them to accomplish the tasks without HRMIS. This is to confirm the role of mandatory usage of HRMIS as one of the main concern of the study. On contrast, many past studies posited usage as strong predictor in measuring satisfaction ([39]; [31]; [20]; [17] and [5]). However, as suggested by [39], IS use is a behavior and not a success measure therefore it is not suitable in mandatory environment. Under the mandatory environment, IS use is not the option that a user can choose, so IS use construct was eliminated in this case.

Based on survey carried out in this study, HRMIS is adopted to replace previous human resource system in public sector. The adoption of HRMIS confirmed that the application is widely used at a large scale in Malaysian public sector. It was found there is no manual practice anymore in this modern technology era. The result from the survey also confirmed that computerized IS (HRMIS) plays very important role in business nowadays. The employees believed by integrating HRMIS with other IS would bring huge benefits to the organizations.

The survey findings revealed that the most common IS used in public sector are personnel IS, followed by registration IS and revenue IS. The employees were also agreed that HRMIS is well integrated with other IS and they were not find many problems when operating HRMIS with other applications. One of the major concerns of this study is regarding user satisfaction towards net benefits. The results supported the first objective which indicated that IS user satisfaction (ISUS) indeed is a predictor to net benefits (NB). Even though, R^2 value for ISUS only at 0.341 or 34.1% explained the NB, but it was sufficient enough to fulfill the first objective of this study. The survey also discovered that system quality (SQ) and information quality (IQ) continue as importance constructs to explain ISUS. However, technostress (TS) and service quality (SERVQ) was found not significant in explaining ISUS and this is contradicted with past studies which posited TS and SERVQ as predictors to ISUS. However, this anomaly brings opportunities for discussion on future research. In this study, TS

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was demonstrated insignificant due to most employees felt that they were well-adapted with current technology development and well prepared for any technology changes. This is because with rapid evolvement of technologies nowadays, their openness toward technology was not an issue or barrier for them to adapt with HRMIS. The results on SQ, IQ, TS and SERVQ answered the second objective of the study on explaining ISUS.

The perception on employees toward HRMIS also produced supportive findings regarding user involvement (UI). The respond from the survey indicated most of the employees do not involved with the development of HRMIS either pre and post implementation. The application was already installed and ready to use within the organization, so the employees do not know much regarding HRMIS implementation. However, based on interviews with several employees who were directly involved with HRMIS felt that they were only allowed to involve at minimal level. There were some discussion held between them and IS developer, and then they were asked several questions before HRMIS is implemented. Thus, they felt do not fully engaged with HRMIS in terms of involvement because they expected more role should be played by them during HRMIS implementation such as contributing ideas, work difficulties, limitation technology and most importantly HRMIS should be designed based on their perspective of work and not only from perspective managerial point of view. However, the results from PLS analysis shown that UI had slightly significant in moderate the relationship between ISUS and NB. This implied, UI still play important role to influence satisfaction and according to [19] UI between user and the developer

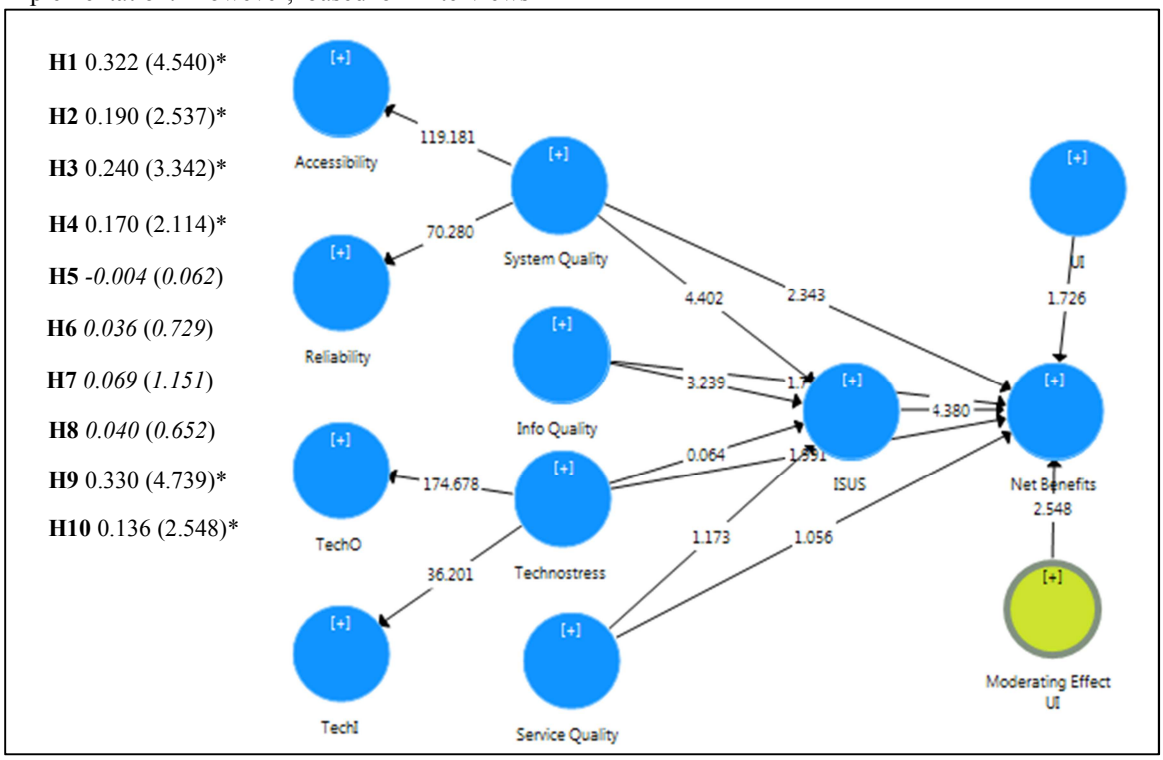

Figure 5: Results from the Conceptual Model

of the IS should be in line together in order to ensure the IS is worthwhile of investment in terms functionalities, satisfaction and benefits.

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APPENDICES

APPENDIX 1

Fornell-Larcker Criterion

	Access	ISUS	IQ	NB	Relia	SERVQ	SQ	TechI	TechO	TS
Access	0.794									
ISUS	0.428	0.823								
IQ	0.607	0.486	0.778							
NB	0.439	0.512	0.461	0.822						
Relia	0.733	0.537	0.649	0.444	0.844					
SERVQ	0.323	0.285	0.415	0.257	0.341	0.843				
SQ	0.952	0.508	0.669	0.473	0.906	0.355	0.759			
TechI	-0.189	-0.098	-0.259	-0.095	-0.216	-0.350	-0.215	0.928		
TechO	-0.330	-0.269	-0.380	-0.206	-0.360	-0.390	-0.367	0.757	0.887	
TS	-0.303	-0.227	-0.361	-0.181	-0.333	-0.399	-0.338	0.882	0.976	0.850

Heterotrait-Monotrait Ratio (Htmt)

	Access	ISUS	IQ	NB	Relia	SERVQ	SQ	TechI	TechO	TS
Access										
ISUS	0.464									
IQ	0.657	0.525								
NB	0.481	0.556	0.504							
Relia	0.806	0.587	0.710	0.492						
SERVQ	0.342	0.297	0.438	0.273	0.368					
SQ	1.032	0.541	0.715	0.512	0.978	0.371				
TechI	0.202	0.108	0.278	0.117	0.235	0.369	0.227			
TechO	0.348	0.286	0.403	0.219	0.385	0.402	0.382	0.793		
TS	0.318	0.242	0.383	0.197	0.355	0.412	0.351	0.922	1.009	

ISSN: 1992-8645 www.jatit.org E-ISSN: 1817-3195

Htmt Inference < 1.0

	Original Sample (O)	Sample Mean (M)	5.0%	95.0%
ISUS -> NB	0.330	0.334	0.214	0.435
IQ -> ISUS	0.240	0.249	0.137	0.374
IQ -> NB	0.170	0.166	0.033	0.294
SERVQ -> ISUS	0.069	0.075	-0.027	0.171
SERVQ -> NB	0.040	0.042	-0.060	0.139
SQ -> Access	0.952	0.951	0.936	0.963
SQ -> ISUS	0.322	0.311	0.186	0.418
SQ -> NB	0.190	0.184	0.061	0.310
SQ -> Relia	0.906	0.905	0.878	0.927
TS -> ISUS	-0.004	-0.003	-0.126	0.107
TS -> NB	0.036	0.038	-0.046	0.116
TS -> TechI	0.882	0.881	0.836	0.920
TS -> TechO	0.976	0.975	0.965	0.984

ISSN: 1992-8645 www.jatit.org E-ISSN: 1817-3195

APPENDIX 2

Results Summary for Reflective Measurement Model

Latent Variable	Indicators	Indicator Reliability	Composite Reliability	AVE	Discriminant Analysis
SQ				**0.576**	
Reliability	*SQ1*	0.735		**0.631**	
	SQ2	0.735			
	SQ3	0.776			
	SQ4	0.759			
	SQ5	0.768			
	SQ6	0.779	**0.951**		
	SQ7	0.766		**0.712**	**Yes**
	SQ8	0.738			
Accessibility					
	SQ11	0.799			
	SQ12	0.770			
	SQ13	0.738			
	SQ14	0.758			
	SQ15	0.803			
IQ	*IQ1*	0.725			
	IQ2	0.770			
	IQ3	0.790			
	IQ4	0.785			
	IQ8	0.771			
	IQ9	0.787	**0.947**	**0.605**	**Yes**
	IQ10	0.802			
	IQ11	0.819			
	IQ12	0.787			
TS				**0.723**	
TechO	*TS1*	0.823		**0.860**	
	TS2	0.871			
	TS3	0.866			
	TS4	0.802			
	TS5	0.807			
	TS6	0.840			
	TS7	0.848	**0.963**		**Yes**
	TS8	0.854			
	TS9	0.803			
TechI	*TS10*	0.730		**0.786**	
	TS11	0.774			
	TS12	0.773			
	TS13	0.807			
SERVQ	*SERVQ1*	0.875			
	SERVQ2	0.820			
	SERVQ3	0.879			
	SERVQ4	0.843			
	SERVQ5	0.857			
	SERVQ6	0.823	**0.958**	**0.711**	**Yes**
	SERVQ7	0.859			
	SERVQ8	0.808			
	SERVQ9	0.790			
ISUS	*ISUS1*	0.783			
	ISUS2	0.841			

ISSN: 1992-8645 www.jatit.org E-ISSN: 1817-3195

	ISUS3 *ISUS4* *ISUS5* *ISUS6* *ISUS7*	0.853 0.839 0.836 0.871 0.820	**0.942**	**0.677**	**Yes**
NB	*NB1* *NB2* *NB3* *NB4* *NB5* *NB6*	0.726 0.808 0.845 0.837 0.786 0.824	**0.917**	**0.676**	**Yes**

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APPENDIX 3

Path Coefficient for Significance Testing

	Original Sample (O)	Sample Mean (M)	Standard Error (STERR)	T Statistics (|O/STERR|)	P Values
ISUS -> NB	0.330	0.334	0.070	4.739	0.000
IQ -> ISUS	0.240	0.249	0.072	3.342	0.000
IQ -> NB	0.170	0.166	0.080	2.114	0.017
SERVQ -> ISUS	0.069	0.075	0.060	*1.151*	0.125
SERVQ -> NB	0.040	0.042	0.061	*0.652*	0.257
SQ -> Access	0.952	0.951	0.008	113.255	0.000
SQ -> ISUS	0.322	0.311	0.071	4.540	0.000
SQ -> NB	0.190	0.184	0.075	2.537	0.006
SQ -> Relia	0.906	0.905	0.015	62.236	0.000
TS -> ISUS	-0.004	-0.003	0.069	*0.062*	0.475
TS -> NB	0.036	0.038	0.049	*0.729*	0.233
TS -> TechI	0.882	0.881	0.025	35.262	0.000
TS -> TechO	0.976	0.975	0.006	165.991	0.000