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Abstract

This article examines the role of enabling change factors in information technology (IT) success in the Malaysian e-government implementation. Enabling change factors are defined as the capability of organizations to bring about desired changes in terms of possessing the appropriate mechanisms like human skills, tool, technology, methodology etc. (Nance 1996). Based on previous research, this study posits three enabling change factors namely organizational support for change, project-planning process and proactive technological orientation. This study also proposes measures for these respective factors. The study adopted a cross-sectional survey research approach. Respondents were officers and directors who were users of e-services, e-procurement, generic office environment, human resource management information system, project monitoring system and electronic labor exchange based at seven lead e-government agencies in Putrajaya and the Klang Valley. There was evidence to suggest that in the Malaysian e-government environment, there was a link between enabling change factors and IT success.

Keywords: Change, IT Success, E-government

1. Introduction

In the last decade, the general public expectation in the quality of government's delivery of services to citizens has elevated tremendously. Information technology (IT) is often viewed as the means for transformation in most government's change agenda including in electronic government or e-government. Turban *et al.* (2002) suggested that e-government encompasses applications of various technologies to provide citizens with more convenient access to government information and services; and to provide delivery of public services to citizens, business partners and suppliers, and those working in the government sector. For most countries, the journey towards the final stage of e-government or the transformation stage is still a long way (Mohamed *et al.* 2005). One of the necessary building blocks for e-government is interoperability (Landsbergen and Wolken, 2001). Interoperability is referred to as getting people talking and sharing information in an IT environment and as a result enhances effectiveness, efficiency and responsiveness. Hence, it must be noted that interoperability in governments can only be attained when there are appropriate IT tools in place.

Recognizing the need to enhance the standard of quality in service delivery to citizens through IT, the Malaysian government introduced seven Web-based information systems

as part of the Multimedia Super Corridor (MSC) initiatives. These systems were expected to support exchange of information among government, citizens and businesses. The seven Web-based information systems were e-services, e-syariah, e-procurement, generic office environment, human resource management information system, project monitoring system and electronic labor exchange. The Malaysian government appointed a government agency to lead the implementation of each system. Thus far, to the best of the authors' knowledge there has not been a study that had explored the measures of enabling change factors and IT success for these systems.

Based on past studies, we posit in this paper that there is a link between enabling change factors and IT success. Enabling change factors are defined as the capability of organizations to bring about desired changes in terms of possessing the appropriate mechanisms like human skills, tool, technology, methodology etc. (Nance 1996). We note that there is an abundance of literature on IT success in the private sector. But studies in either the e-government context or IT success in the public sector especially in developing countries continue to lack. We believe that we would be able to fill some of these gaps by adapting a model from the private sector to test for applicability in the e-government environment. This is much in line with recommendations to combine the best features of the traditional public administration perspective with modern business theory and practice often referred to as the 'third way' (Gunn, 1988; Osborne and Gaebler, 1992; Mintzberg, 1996). Hence, our objectives of this paper are twofold. One is to explore the measures of enabling change factors. Two is to investigate the link between enabling change factors and IT success.

This paper is organized into six sections. This section has introduced the research area. Both the review of literature and research framework are in section two. Section three presents the methodology. The findings are available in section four. The fifth and last sections provide the discussion of findings and conclusions.

2. Review of Literature and Research Framework

The implementation of new technology almost always involves putting people through organizational change (Luftman *et al.* 2004). According to Luftman *et al.* (2004), the complex interaction between people and systems (like hardware, software etc.) makes it difficult to understand problems in information technology whether they are associated with technology or the way people use the technology. Practitioners and researchers alike need to understand the complexities in not only the implementation and use of technology but also the enabling change factors to ensure success.

Studies on the public sector seem to suggest that there are differences between information systems in the public sector and that in the private sector (Bretschneider, 1990; Aggarwal and Mirani, 1999; Rocheleau and Wu, 2001). Some of these differences were perhaps marked by organizational features that characterized the public and private sector. Farnham and Horton (1996) argued that private firms must pursue the single goal of profit acquisition while public agencies in contrast, are pushed and pulled in many directions simultaneously. Therefore, it is important for public managers to be able to balance and reconcile conflicting objectives. Also, public organizations were expected to

be more cautious and more involved in red tape, whereas private organizations are expected to take more risks (Rainey *et al.* 1995; Bozeman and Kingsley, 1998).

Some researchers found that internal factors in the organizations played a stronger facilitating role than external factors (Kraemer *et al.* 1981; Laudon, 1985; King and Teo, 1994; Ang *et al.*, 2001). In a qualitative study of a Malaysian public sector agency's IS implementation, organizational politics, social relationship, cultural and political perspectives were cited among notable issues (Mohd Yusof, 2005). While there could be an abundance of organizational issues to focus on, this study would explore organizational, project and technical implementation as enabling change factors.

In the past, researchers examined implementation factors in organizations in terms of organizational, project and technical implementation aspects in data warehouse environment (Wixom and Watson, 2001; Hwang *et al.* 2004). Based on these previous researches, this study posits three enabling change factors namely organizational support for change, project-planning process and proactive technological orientation.

2.1 Organizational Support for Change as an Enabling Change Factor
For any organization, IT implementation is an expensive endeavor. In the past, many researchers stressed the importance of organizational factor on IT implementation success (Swain *et al.*, 1995; Chang *et al.*, 2000; McNish, 2001; and Li, 2003). It is observed that recognizing organizational support for change as an enabling change factor will reduce the risks of failure. The variables that can be explored are: top management support (Premkumar and Ramamurthy, 1995; Igbaria *et al.* 1997; Grover, 1998; Wixom and Watson, 2001; Zhang *et al.* 2003; Byrd and Davidson, 2003; Hwang *et al.* 2004); the existence of champions (Beath, 1991; McNish, 2001; Wixom and Watson, 2001) and organizational compatibility (Kwon and Zmud, 1987; Grover, 1993; Thong, 1999).

Top management support – Top management support is widespread sponsorship for a project across the management team (Wixom and Watson, 2001). Sponsors have funds and authority to accomplish their goals (Vitale and Ives, 1988). Top management support can overcome political resistance and encourage participation throughout the organization (Markus, 1983).

Champions – Champions influence processes of change. The literature suggests that in driving change with the use of information technology, the existence of champions is imperative for successful IT implementation (Beath, 1991; McNish, 2001).

Organizational compatibility – Organizational compatibility is defined as the match between the information systems and the existing organizational values and work practices. Incompatibility of the new technology with the existing values and work practices has been found to be one of the greatest inhibitors for innovation adoption (Kwon and Zmud, 1987). Thong (1999) found that organizational compatibility is important for adoption of technology. In particular, this study will explore the match between the systems and the existing agencies involved in e-government implementation organizational values and work practices.

Therefore, it is hypothesized that:

H1: Organizational support for change is associated with IT success.

2.2 Project-planning Process as an Enabling Change Factor

The project-planning process as an enabling change factor is concerned with resolving all related problems or issues about the project in bringing about change with IT implementation. The project enabling change measures that can be explored are:

Project Team Skills – The members of the project team who possess a strong background and knowledge of information technology and ability to communicate at every level will certainly be able to assure IS success. Arguably, it is imperative for project team members to possess a good understanding of users' requirements. The skills of a project team have been found to be associated with project implementation success but not technical success (Wixom and Watson, 2001) and associated with adoption of technology (Hwang *et al.*, 2004).

Resources – IT implementation involving various government agencies can be resource-consuming. According to Haley (1997), organizational resources encompass capital, development time and labour. Hwang *et al.* (2004) defines degree of coordination of organizational resources as the degree of support for needed budgets, time needed and degree of support for needed labour. A high level of resources is associated with both organizational and project implementation success (Wixom and Watson, 2001) but not with adoption of technology (Hwang *et al.*, 2004).

User Participation – User participation concerns an individual's subjective attitude towards the end product/systems. Participation of users has been found to correlate with systems success (Santhanam *et al.* 2000; Wixom and Watson, 2001). However, Hwang *et al.* (2004) found it was not correlated to data warehouse adoption.

Therefore, it is hypothesized that:
H2: Project-planning process is associated with IT success.

2.3 Proactive Technological Orientation as an Enabling Change Factor

Because the environment of the government operation is interdependent among one another, the technical complexity of managing this integration is high. The availability and access of proper IT infrastructure is a fundamental prerequisite for installation of information system. Conformity to a broad IT plan must be assured while specific technical skills that are not available from within government IT departments should be sought in order to ensure IT success. Grover (1993) in his study of customer-based inter-organizational systems (CIOS) hypothesized IT infrastructure and IT planning (among others) were measures for proactive technological orientation. Hence, the measures for proactive technological orientation that can be explored are:

IT Infrastructure – In this study, IT infrastructure refers to the adequacy level of the technology component performance that enables Web-based information systems. This would cover hardware, software, systems, communications, application maintenance and technology investment. An adequate level of IT infrastructure is important to ensure that it is able to support Web-based information systems in e-government environment whose users may be drawn from several agencies at different work locations. Zhu *et al.* (2002)

found that physical IT infrastructure contributed to e-business adoption.

IT Plan Utilization – Doll (1985) reported that firms with successful information systems were three times more likely to have and use formal plans for systems development. Byrd and Davidson (2003) found that IT plan utilization is positively associated with IT impact on the supply chain.

Therefore, it is hypothesized that:

H3: Proactive technological orientation is associated with IT success.

2.4 Moderating Effect of the Characteristic of Government Information Delivery

Studies in the private sector often characterized specific variables like industry types, technology types that support task types or information characteristics as key moderating variables (Grover *et al*., 1998; Bhatt, 2000). We believe that government agencies are differentiated from each other and from the private sector in terms of who the recipients of the information that these agencies deliver to (this is marked by the types of services and functions that characterized the respective agencies) i.e. whether within government agencies and citizens/businesses. This is further affirmed in the definition supplied by the Organisation for Economic Co-operation and Development that e-government components include four major *internal* and *external* aspects: (i) the establishment of a secure government intranet and central database for more efficient and cooperative interaction among government agencies; (ii) Web-based service delivery; (iii) the application of e-commerce for more efficient government transaction activities, such as procurement and contract; and (iv) digital democracy for more transparent accountability of government (Government and the Internet Survey 2000).

Therefore, it is hypothesized that:

H4: The relationship between enabling change factors (organizational support for change, project-planning process, and proactive technological orientation) and IT success is moderated by the characteristic of government information delivery.

The research framework is in Figure 1.

3. Methodology

The study adopted a cross-sectional survey and self-administered procedure. Targeted respondents were internal end-users of six Web-based information systems. E-syariah was omitted on account that E-syariah was in the process of roll-out at the point of data collection (refer to http://www.jksm.gov.my/web/template/esyariah.php). In compliance with Malaysia's government agencies' procedure for participation of their staff in survey research and also in maximizing response rate, the researcher only sent the survey questionnaire to offices of directors and/or deputy directors of users' and technical divisions.

In this study, measures of IT success comprising user satisfaction, system quality and information quality were borrowed and adapted from Seddon and Kiew (1996). Respondents were required to evaluate agreement to statements that used a seven-point Likert scale. A seven-point represents "strongly agree" while a one-point represents

"strongly disagree". Table 1 shows the measures and sources.

Figure 1. Research Framework

Figure 1. Research Framework
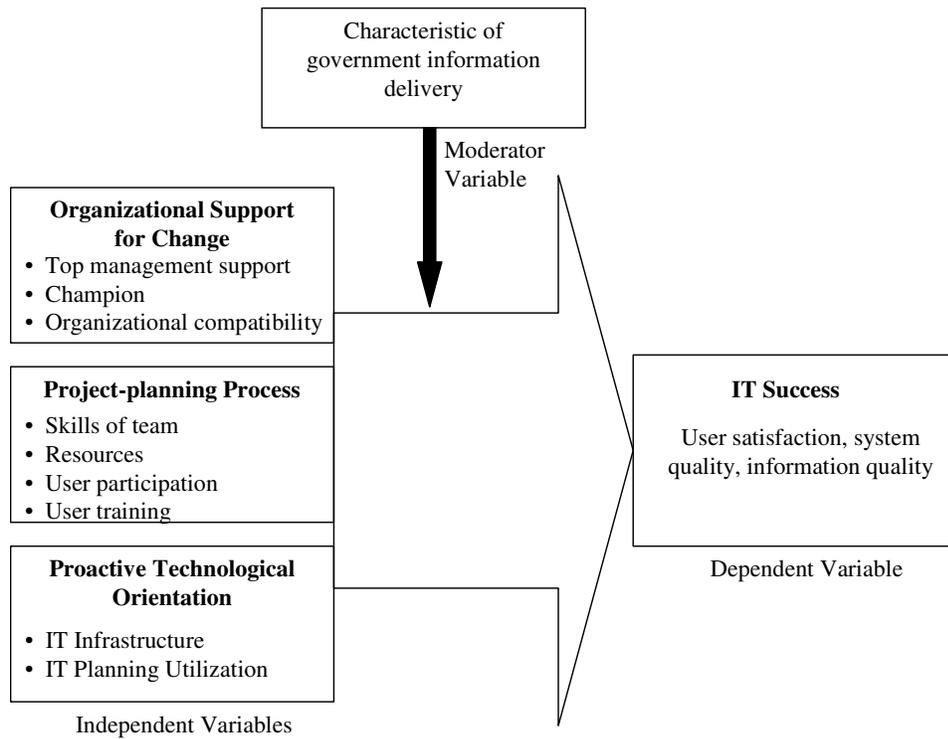
Table 1. Measures and Sources

Measures	Sources
Organizational support for change	
Top management support	Wixom and Watson (2001)
Champion	Wixom and Watson (2001); Hwang *et al.* (2004).
Organizational compatibility	Premkumar and Ramamurthy (1995).
Project-planning process	
Skills	Wixom and Watson (2001)
Resources	Wixom and Watson (2001)
User participation	Wixom and Watson (2001)
Proactive technological orientation	
IT infrastructure	Wixom and Watson (2001); Byrd and Davidson (2003)
IT plan utilization	Byrd and Davidson (2003)

For the enabling change factors, respondents were required to evaluate agreement to statements that used a seven-point Likert scale. A seven-point represents "strongly agree" while a one-point represents "strongly disagree".

Fifteen questionnaires were distributed to senior members of academic staff and doctoral students of the Faculty of Information and Communication Technology at the

International Islamic University Malaysia for pretest. 30% responded and the feedback was incorporated accordingly. A pilot test was conducted using the improved version of the survey instrument based on the pretest. A total of seventy survey questionnaires were then distributed to three government agencies namely Ministry of Human Resources (MOHR), MAMPU and Public Service Department (PSD) for pilot test. The instrument was revised accordingly based on feedback from the pilot test.

4. Findings

A total of 437 questionnaires were distributed between December 2004 and March 2005 to non-clerical staff at seven Malaysia's e-government lead implementing agencies. The number of usable response was 130; yielding a usable response rate of 29.7%. Data was analyzed using SPSS Version 13.0.

A *t*-test was conducted to check for non-response bias. It was found that there were no significant differences. *t*-tests were also conducted to check for differences among end users' gender and two groups of education level. It was found that there were no significant differences in gender and education level. A one-way ANOVA was performed for end users' age. Three groups were identified namely (i) below 29 years old (ii) between 30 and 39 years old and (iii) more than 40 years old. The analysis of variance revealed non-significant differences among these age groups. The profile of respondents is in Table 2.

Characteristics	Item	Frequency	Percentage
	Administrative & Support	14	10.8
Gender	Male	64	49.2
	Female	64	49.2
Age Group	20-29	51	39.2
	30-39	35	26.9
	40-49	28	21.5
	Over 49	15	11.5
Education Level	Upper secondary education (MCE/SPM/GCE O level)	7	5.4
	Diploma/certificate/HSC/STPM/ GCE A level	23	17.7
	Bachelor's degree	77	59.2
	Master's degree	21	16.2
	Others	2	1.5
Job Level	Executive/top management	6	4.6
	Middle management	74	56.9
	Technical and professional	35	26.9
	Supervisory	1	.8

Table 2. Profile of Respondents

In terms of gender, the proportion of male and female respondents was equal. In terms of age group, 39% of the total respondents were between the age of 20 and 29 with the remaining (60.4%) 30 years and over. This composition suggests that the respondents had reached sufficient age maturity level to evaluate the Web-based information systems.

The majority of respondents (76.9%) had at least a Bachelor's degree. A high proportion of them (89.2%) occupied management and technical positions. It could be implied from these figures that the high education and job level would indicate that the respondents were generally familiar with management evaluation process.

Discriminant analysis was checked by means of a factor analysis. Factor analysis was performed for the enabling change measures. The criteria used in this study were to adopt a cut-off loading point for factors with eigenvalues greater than 1.0. In interpreting factors to determine which factor loadings are worth considering, this study adopted loadings .50 as significant since the sample size is 130 based on the recommendation in Hair *et al*. (1998). All the enabling change measures were entered into principal axis factoring with *Varimax* rotation. The results of factor analysis are in Table 3.

Following this procedure, reliability analysis for both the enabling change factors and IT

success were conducted. One commonly used method to assess the internal consistency reliability is Cronbach's alpha. The coefficient alphas greater than .70 indicated reliable constructs (Nunnally, 1978). The results of reliability analysis are in Table 4 and 5 respectively.

Table 3. Factor Analysis

	1	2	3
The champion(s) had the capability to provide related information. *(measures champion)*	.847		
The champion(s) provided the assistance to secure organizational resources. *(measures champion)*	.776		
User satisfaction has been a major concern of management. *(measures top management)*	.728		
A high-level champion(s) for e-government systems came from functional area(s). *(measures champion)*	.724		
The champion(s) had the ability to acquire supports from all divisions. *(measures champion)*	.720		
The changes to work procedures initiated by e-government systems are compatible with the beliefs and values existing in the agency. *(measures organizational compatibility)*	.568		
The changes introduced by e-government systems are compatible with existing operating practices.*(measures organizational compatibility)*	.545		
A high-level champion(s) for e-government systems came from IS. *(measures champion)*	.526		
Overall, the management has encouraged the use of the e-government systems. *(measures top management)*	.525		

Table 3. Factor Analysis … cont.'

	1	2	3
Members of the e-government systems project had the right technical skills for e-government. *(measures skills)*		.657	
Users were assigned full-time to parts of the e-government systems project. *(measures participation)*		.580	
The e-government systems project had enough team members to get the work done. *(measures resources)*		.559	
Members of the e-government systems project had good interpersonal skills. *(measures skills)*		.538	
Long-term data infrastructure plans exist and are followed. *(measures IT plan utilisation)*			.761
Long-term network infrastructure plans exist and are followed. *(measures IT plan utilisation)*			.748
Long-term strategy plans ensuring adequacy of enterprise-wide processing capabilities exist and are followed. *(measures IT plan utilisation)*			.696
The e-government systems technology that the project team used worked well with technology already in place in the agency.*(measures IT infrastructure)*			.594
Communications services are efficient. *(measures IT infrastructure)*			.591
Hardware and operating systems are effective. *(measures IT infrastructure)*			.529
IS/IT unit/division planning supports the agency's ability to keep up with changing technology. *(measures IS/IT plan utilisation)*			.521

Table 4. Reliability Analysis for Enabling of Change Factors

Table 5. Reliability Analysis for IT Success Factors

Measures	Cronbach's alpha
User satisfaction (number of items: 4)	.929
System quality (number of items: 5)	.931
Information quality (number of items: 10)	.950

Measures	Cronbach's alpha
Organizational support for change *(factor 1)*	.917
Project-planning process *(factor 2)*	.787
Proactive technological orientation *(factor 3)*	.912

Based on Tables 4 and 5, the range of Cronbach's alpha in this study is from .79 to .95 indicating reliable constructs. For convergent validity, we checked the item-to-total correlation that is the correlation of each item to the sum of the remaining items. The item-to-total correlation score for all items were all above .40.

Correlation analysis was conducted among IT success factors. The results of this correlation analysis are in Table 6.

Table 6. Correlation Analysis among IT Success Factors

	System quality	Information quality	User satisfaction
System quality	1.00	.589**	.721**
Information quality	.589**	1.00	.757**
User satisfaction	.721**	.757**	1.00

** Correlation is significant at the 0.01 level (2-tailed)

The values of Pearson's r range from r=.589 to r=.757. Based on the results in Table 6, there is a significant positive correlation among IT success measures. Applying the criteria as set out by Cohen and Holliday (1982) and Bryman and Bell (2003) when determining the strength of relationship, it is observed that there is a strong correlation between user satisfaction and system quality. There is also a strong correlation between user satisfaction and information quality. The relationship between system quality and information quality is modest. The findings indicate that users will experience higher satisfaction when the system possesses higher system quality. Likewise, users will experience higher satisfaction when the systems produce higher quality of information. Following correlation analysis, the user satisfaction, system quality and user satisfaction measures were summated into an IT success factor. Summated scale is a method of combining several variables that measure the same concept into a single variable in an attempt to increase the reliability of the measurement (Hair *et al*., 1998).

For the enabling change factors, based on the results of factor analysis, the measures from top management, champion and organizational compatibility were summated into organizational support for change factor. The measures for resources, skills and user participation were summated into project-planning process as an enabling change factor. The measures for IT planning utilization and IT infrastructure were summated into proactive technological orientation as an enabling change factor. Correlation analysis was performed between enabling change factors and IT success. The results of this correlation analysis are in Table 7.

Table 7. Correlation Analysis between Enabling Change Factors and IT Success

	IT Success
Organizational support for change	.592**
Project-planning process	.614**
Proactive technological orientation	.608**

** Correlation is significant at the 0.01 level (2-tailed)

The values of Pearson's r range from r=.592 to r=.614. Based on the results in Table 7, there is a significant positive correlation between all enabling change factors and IT success. Applying the criteria as set out by Cohen and Holliday (1982) and Bryman and Bell (2003) when determining the strength of relationship, it is observed that there is a modest correlation between all enabling change factors and IT success. The findings indicate that the higher the organizational support for change rendered in government agencies, the higher will the agencies experience IT success. Likewise, when there is a high degree of project-planning process and proactive technological orientation activities taking place, the higher will this agency experience IT success.

Following correlation analysis, multiple regression analysis was applied. Multiple regression analysis is a multivariate analysis technique which allows for the simultaneous investigation of the effect of two or more independent variables on a single interval-scaled dependent variable (Zikmund, 2003; Neuman, 2003). The results of multiple regression are in Table 8a and 8b.

Table 8a. Results of Stepwise Multiple Regression

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.614[a]	.377	.372	.78045
2	.683[b]	.466	.458	.72554
3	.704[c]	.495	.483	.70837

a. Predictors: (Constant), Project-planning

b. Predictors: (Constant), Project-planning, organizational support for change

c. Predictors: (Constant), Project-planning process, organizational support for change, proactive technological orientation

Table 8b. Results of Stepwise Multiple Regression

Coefficientsᵃ

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	1.931	.322		6.002	.000
	Project-planning	.591	.067	.614	8.807	.000
2	(Constant)	.779	.390		1.997	.048
	Project-planning	.395	.076	.411	5.230	.000
	Organizational support for change	.398	.087	.361	4.594	.000
3	(Constant)	.682	.383		1.783	.077
	Project-planning	.306	.081	.318	3.784	.000
	Organizational support for change	.280	.095	.254	2.941	.004
	Proactive technological orientation	.240	.089	.245	2.689	.008

a. Dependent Variable: IT Success

From table 8a, in the first regression model, project-planning process was the only independent variable and this variable explains 37.7% of the variation in IT success. In the second regression model (also from table 8a), organizational support for change was entered into the regression analysis and this led to increasing the R^2 by 8.9%. In the third regression model (also from table 8a), proactive technological orientation was entered into the regression analysis and this led to increasing the R^2 by 2.9%. In examining the standardized beta values for variables predicting IT success (table 8b), project-planning process has the highest contribution effect on IT success (beta=.318). Organizational support for change emerged having next in contributing towards IT success (beta=.254). The final factor that contributed towards IT success was proactive technological orientation (beta=.245). Hence, this study supports Hypotheses 1, 2 and 3.

In order to test the final hypothesis, the following model was used:
ITSUCCESS = β_1(Organization) + β_2(Project) + β_3(Technological) +
β_4(Organization*moderator variable) + β_5(Project* moderator variable)
+ β_6(Technological*moderator variable)
where β are regression coefficients.

The Web-based information systems were classified and coded into two distinct groups i.e. one group supports information delivery to government agencies and the other provides information and service delivery to citizens/businesses. The entire model with

interaction terms was run. According to Cohen and Cohen (1983), an increase in adjusted R-square is a sufficient indicator for specifying the entire full model with interaction terms because interaction terms increase the predictive power beyond that which could be explained by independent variables alone. When significant predictors are interpreted, the entire model is referred (Kerlinger, 1986). In this study, there were no significant predictors for the interaction terms i.e. the moderating relationship (*H4*) was found to be insignificant ($p > 0.05$). Furthermore, the adjusted R-square for the entire full model with interaction terms was 0.474. This value became smaller from the main effects model (0.483) - suggesting that interaction terms did not predict significantly the variance above than those predicted by organizational support for change, project-planning process and proactive technological orientation. Hence, the final hypothesis (*H4*) is not supported in this study.

5. Discussion

The project-planning process as an enabling change factor has shown to influence IT success. In order to ensure successful IT implementation in e-government environment, it is necessary for government agencies and the leadership to make available appropriate skills associated with the change and sufficient resources in terms of team members during the course of change and implementation.

The analysis results provide support for the phenomenon that organizational support for change is a significant predictor of IT success. This finding shows that for government agencies to succeed in IT implementations particularly in e-government environment, they must pay serious attention to organizational capability to change as a whole when IT is introduced. This covers the people aspects driving the change especially in terms of leadership support, championing the cause of change and compatibility of change with beliefs and values. This finding affirms previous studies by Swain *et al.* (1995); Chang *et al.* (2000), McNish (2001) and Li (2003) that asserted the importance of organizational and change characteristics when introducing IT to avoid failure.

In order to provide seamless capability and interoperability between government and citizens/businesses as well as within government agencies, government agencies need to have appropriate technological infrastructure. This covers the aspects of hardware, operating systems and networking for communication purposes. When introducing new technology, government agencies must ensure that the new technology would work well with the existing technology that is already in place. This could only be achieved when there is a proper strategic IT planning that covers an entire spectrum of technological capabilities (i.e. data and network infrastructure as well as other relevant enterprise-wide processing capabilities). The compliance to the strategic IT planning agenda is also critical in e-government environment. Hence, the role of IT divisions should not be confined within only daily technical operations that are typically standardized in nature. Rather, IT divisions should be proactive in formulating changing technological requirements that ultimately are to fulfil long term national e-government agenda. This study provides the evidence for the importance of proactive technological orientation as an enabling change factor in contributing to IT success.

In summary, hypotheses *H1*, *H2* and *H3* i.e. the main effects of organizational support for change, project-planning process and proactive technological orientation as enabling change factors on IT success were found to be significant. The effect of the moderator (characteristic of government information delivery) i.e. *H4* was found not to be significant indicating that the characteristic of government information delivery does not affect the main effect of enabling change factors on IT success. That also means that irrespective of the characteristic of government information delivery, government agencies that recognize enabling change factors and who are able to embrace them in IT implementation would attain IT success.

6. Conclusions

The focus of this research has been to fulfil the following objectives: One is to explore the measures of enabling change factors. Two is to investigate the link between enabling change factors and IT success. The first objective of this study has been to explore the measures of enabling change factors. The study showed that the three enabling change factors were project-planning process, organizational support for change and proactive technological orientation. The second objective of the study was to investigate the link between enabling change factors and IT success. The study provided support for the contention that enabling change factors is an important consideration for IT success. While causal links could not be deduced from this research, the finding exposed that generally, enabling change factors significantly contributed to IT success. This study attests to the importance of enabling change factors in IT implementation especially in large scale e-government environment. In terms of theoretical contribution, the study has been able to provide the evidence for the relationship between enabling change factors and IT success. The findings of this study validated previous findings on the positive relationship between enabling change factors and IT success. This study has shown that the model formulated from several studies in the private sector could also be adapted and applied in the e-government implementation context. In other words, the theories that draw change management and IT success perspectives commonly tested in the private sector hold equally well in e-government implementation. In terms of practical contribution, this study is a starting point for assessing IT success and enabling change factors in an e-government environment of a developing nation. Thus, in terms of measures, the study has contributed to practical knowledge, as the measures can now be used by Malaysia's public managers in functional or IT areas to get started on evaluations of future Web-based information systems especially those that support long term national initiatives like e-government.

As with any empirical investigation, weaknesses in methodology and inadequate data are the main constraints. This study is no different. Firstly, the sample size was 130. Confirmatory factor analysis and structural equation modeling for the entire framework could not be used due to the small sample size. Future research should consider a larger sample size to overcome these constraints. Secondly, this study was cross-sectional survey in nature. A weakness of this methodology is that all the independent variables at the beginning point of the implementation were not measured. Therefore, the direct causal effect cannot entirely be inferred. Future research may consider longitudinal approach.

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References

Will be provided upon request.