

SUSTAINING THE CONTINUED USAGE OF MILITARY DIGITAL LIBRARY: INTEGRATION OF ORGANISATIONAL SUPPORT THEORY AND INFORMATION SYSTEM SUCCESS MODEL

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ABSTRACT

This paper aims to explain the factors affecting the continued usage of digital library among the Malaysian military officers. Based on organisational support theory (OST), this study extracted variables namely communication, digital library environment and training and education, whilst Net Benefits Individual Impact, Net Benefits Organisational Impact and Satisfaction are drawn from the DeLone and McLean Information System Success Model (ISSM), as antecedents for continued usage of digital library. In order to test the relationships between the variables, this study collected data from 579 military personnel in Malaysia Armed Forces (MAF). Data were analysed using PLS-SEM, a variance-based SEM. The findings indicate that training and education, digital library environment and communication support are among the factors. These findings imply that in order to sustain the continued usage of digital library among the military officers, the management need to provide sufficient training and tools such as online resources and help desks. Although this study provides new insights for digital library implementation that would further improve the IS success model in military context, the results may not be able to be generalised to other countries' military, since it focuses only on Malaysian setting.

Keywords: Digital Library, IS Successful Implementation, Organisational Support, and Military.

INTRODUCTION

The potentials of digital library in becoming a platform to advocate equitable access to information and promote the e-learning process have encouraged many public institutions in Malaysia, including the Malaysia Armed Force (MAF) to invest heavily on such technology. The aims of MAF's digital library implementation is to provide access to electronic databases, books and journals to the organisation's personnel, regardless of time and place, so as to support their life-long learning. Despite these potential benefits, the MAF has to bear huge amount of hardware and software development costs. Similarly, the actual number of employees who had used the system is quite low. This situation creates a worrying situation to MAF, as insubstantial continuing usage may send a signal that the system has not been successfully implemented. Moreover, infrequent use may create unachieved expected return of investment (ROI). In lieu of this problem, this study aims to examine the factors influencing the continued usage of MAF digital library. Previous literature in the area of information system (IS) have widely used the Delone & McLean (2003) ISSM success model in determining the factors affecting the

continued usage of IS and technologies in various industries (Wang & Wang, 2009; Wang & Chiu, 2011; Garcia-Smith & Effken, 2013; Alzahrani et al., 2019). They highlighted that users' satisfaction and the net benefits of the system as the significant variables. Whilst the theory does provide insights, they may not be able to fully predict the continued usage of digital library. This is because, the use of digital library in the MAF context is voluntary and there are resources that can be used as a substitute to digital library, if they are not satisfied with the system. In this case, the level of support provided by organisations in a form of training and educational might reduce the usage barriers. Based on these arguments, this study will tie up two theories-Delone and McLean IS success model (ISSM) (2003) and organisational support theory, to investigate the continued usage of digital library in the military context. Variables such as net individual benefit, net organisational benefit, and user satisfaction are drawn from the ISSM, whilst training and education, communication support and digital library environment are extracted from OST.

LITERATURE REVIEW

The ISSM asserts that users' satisfaction with the system used, will affect the users' work performance as well as organisation. Drawing upon the model, this study extracted three variables, namely net individual benefit, net organisational benefit, and user satisfaction. Net benefits refer to the users' evaluation on the benefits that can be acquired in the process of using the digital library by individuals as well as the organisation, while users' satisfaction reflects the individual emotional reaction after using the system (i.e. pleasure or disappointment) in comparison to one's expectations before use (DeLone & McLean, 2003). Previous studies (Bhattacharjee & Premkumar, 2004; Huang et al., 2015) highlight that those users who believe that the technology will enhance their job performance and organisational performance will develop positive experiences when using the system, and thus will continue using the system in the future. In the case of digital library, it is postulated that the MAF officers who generally believe that using the system could facilitate them in searching for information and other educational resources at decreased costs might be willing to use the system more often on a voluntary basis, indicating their satisfaction with the system performance and net benefits of the system. Based on these arguments, this study postulates that:

H₁: Net benefit on individual is positively related to continued usage of MAF digital library.

H₂: Net benefit on organisation is positively related to continued usage of MAF digital library.

H₃: Net benefit on individual is positively related to net benefit on organisations.

H₄: Users' satisfaction on MAF digital library is related to its continued usage.

The Organisational Support Theory (OST) asserts that the fulfilment of social-emotional needs and performance-reward expectancies contribute to increased performance and decrease withdrawal behaviour (Rhoades & Eisenberger, 2002). In this study, organisational support, which refers to the assistance provided by organisation in response to the specific needs of an employee (Chadwick & Collins, 2015), will be evaluated based on the extent of training and education, favourable digital library environment and communication support provided. Training and education support is suggested to be required after a system is deployed so that the potential users are able to fully use and benefit from the system (Sharma & Yetton, 2007), whilst infrastructure, helpdesk, and off-job-training are among the examples of digital library

environment supports provided to facilitate users' acceptance and usage of a system (Venkatesh et al., 2003). The communication support provided by the management of the library will enable users to communicate with other users on the problems faced, further enhancing the usage of digital library (Huang et al., 2015). Based on these arguments, this study postulates that:

H₅: Communication support is positively related to net benefit on individual.

H₆: Communication support is positively related to net benefit on organisation.

H₇: Communication support environment is positively related to users' satisfaction

H₈: Digital library environment is positively related to net benefit on individual.

H₉: Digital library environment is positively related to net benefit on organisation.

H₁₀: Digital library environment is positively related to users' satisfaction

H₁₁: Training and education are positively related to net benefit on individual.

H₁₂: Training and education are positively related to net benefit on organisation.

H₁₃: Training and education are positively related to users' satisfaction.

METHODOLOGY AND RESPONDENTS' PROFILES

This study employs explanatory and quantitative research method to test the hypotheses developed. The level of analysis is at the individual level, with the focus on post-adoption experience of users of MAF digital library system.

Respondents' demographics	Details	Frequency	Percentage
Gender	Male,	375	64.8
	Female	204	35.2
Ranks	Officers	261	45
	Other Ranks	318	55
Length of Service	< 10 years	188	32.4
	11-19 years	314	54.3
	> 20 years	77	13.3
Education Level	PHD	-	-
	Masters	127	21.9
	Degree	187	32.4
	Diploma	39	6.7
	Others	226	39.0
Types of Unit	Headquarters	243	41.9
	Operational	88	15.2
	Training	248	42.9
Location of Library/Unit	Malaysian Armed Forces	176	30.5
	Joint Force	28	4.8
	Army	265	45.7
	Navy	50	8.6
	Air Force	60	10.5

This is because the success of any IS, including digital library is greatly depending on users' continued usage rather than its initial phase of adoption (Rezvani *et al.*, 2017). Given this, finding the salient factors affecting the users' post adoption behaviour becomes critical. This study targets the MAF personnel's who have used the MAF digital library system. The measurement items employed is exhibited in Appendix 1. The sampling frame was obtained from the list of users who are registered with the librarian and possess the login and password to access the system. As of November 2018, the number was recorded to be 2210. We selected every 3rd user from the list, giving us about 740 samples. In order to seek their willingness to participate, they were contacted through email. The data were then gathered through either a paper-and-pencil survey or electronic form, as preferred by the respondents. Table 1 indicates the respondents' profiles.

RESULTS AND DISCUSSION

Of the 740 samples, 579 responses were obtained. Data collected from 579 respondents were analysed using Smart PLS 3.2.8. This data analysis method was used since the goal is to predict the antecedents, and the structural model developed has many constructs and indicators (Hair *et al.*, 2014).

Convergent Validity				Discriminant Validity HTMT							
	Loadings	CR	AVE		Y1	Y2	Y3	Y4	Y5	Y6	Y7
CS		0.946	0.853	CS (Y1)							
CS2	0.917			CUI (Y2)	0.797						
CS3	0.927			DLE (Y3)	0.87	0.781					
CS4	0.926			NBI (Y4)	0.704	0.833	0.704				
CUI		0.955	0.841	NBO (Y5)	0.716	0.834	0.691	0.755			
CUI1	0.906			Satisf (Y6)	0.843	0.897	0.815	0.817	0.804		
CUI2	0.932			TE (Y7)	0.82	0.756	0.751	0.652	0.662	0.803	
CUI3	0.924										
CUI4	0.906										
DLE		0.905	0.826								
DLE1	0.906										
DLE2	0.912										
NBI	1	1	1								
NBO	1	1	1								
Satisf		0.956	0.879								
Satisf1	0.945										
Satisf2	0.937										
Satisf3	0.929										
TE		0.927	0.761								
TE1	0.835										
TE2	0.889										
TE3	0.899										
TE4	0.865										

Note: CS Communication Support; CUI Continuation of Usage Intention; DLE Digital Library Environment; NBI Net Benefits Individual Impact; NBO Net Benefits-Organizational Impact; Satisf Satisfaction; TE Training and Education

Prior to testing the hypotheses, this study conducted convergence and discriminant validity test to ensure the measures used are valid and reliable. As indicated in Table 2, all items have loading values of more than the threshold value of 0.7, (Hair et al., 2013), with the average variance extracted (AVE) and composite reliability score (CR) of all constructs achieved 0.5 (Bagozzi & Yi, 1988) and 0.7 (Hair et al., 2013) respectively, demonstrating good convergent validity. Following the Henseler et al. (2015), this study used HTMT to examine the discriminant and found that the HTMT value is not more than 0.85 (Kline 2015), indicating good discriminant validity.

Bootstrapping is used to examine the statistical significance of path coefficients and predictive relevance of R^2 and f^2 . Hair et al. (2011) suggested a minimum threshold of 1.65 t -statistics values at $p \leq 0.1$ confidence interval. Based on this threshold values, this study found that of the 13 hypotheses tested, only one are not supported (H_{11}) (Table 3). Sarstedt et al. (2014) highlighted that R^2 values of 0.75, 0.50, and 0.25 reflect substantial, moderate, and weak values respectively. Based on these values, we could safely say that the impact is substantial and moderate. Meanwhile, f^2 is identified to know about the power of this model and the results show it has a nearly small to medium effect size.

Hypothesis	Beta Value	Std Error	T Value	P Values	LL	UL	R^2	f^2	Decision
CS -> NBI	0.144	0.078	1.857	0.032	0.022	0.276	0.631	0.017	Supported
CS -> NBO	0.366	0.071	5.157	0	0.247	0.479	0.518	0.09	Supported
CS -> Satisf	0.384	0.066	5.793	0	0.278	0.495	0.681	0.15	Supported
DLE -> NBI	0.144	0.044	3.281	0.001	0.075	0.221	0.631	0.024	Supported
DLE -> NBO	0.19	0.059	3.222	0.001	0.09	0.286	0.518	0.033	Supported
DLE -> Satisf	0.209	0.056	3.7	0	0.118	0.306	0.681	0.06	Supported
NBI -> CUI	0.275	0.066	4.158	0	0.156	0.372	0.789	0.118	Supported
NBO -> CUI	0.297	0.068	4.379	0	0.196	0.42	0.789	0.144	Supported
NBO -> NBI	0.501	0.055	9.175	0	0.402	0.585	0.631	0.328	Supported
Satisf -> CUI	0.391	0.052	7.464	0	0.3	0.475	0.789	0.22	Supported
TE -> NBI	0.105	0.075	1.41	0.079	-0.022	0.223	0.631	0.012	Not Supported
TE -> NBO	0.238	0.061	3.907	0	0.136	0.337	0.518	0.049	Supported
TE -> Satisf	0.319	0.05	6.42	0	0.232	0.397	0.681	0.133	Supported

Note: CS Communication Support; CUI Continuation of Usage Intention; Digital Library Environment; NBI Net Benefits-Individual Impact; NBO Net Benefits-Organizational Impact; Satisf Satisfaction; TE Training and Education

CONCLUSION

The aim of the research is to determine the factors influencing continued usage of MAF digital library among the military personnel, through integrating two theories-OST and ISSM. The integration of these two theories contributes to a better understanding of how the continuous usage of MAF digital library could be sustained. This is because, relying on the ISSM theory solely may not be able to predict the antecedents fully, since digital library usage in the context

of Malaysian military setting is not an obligation. As the usage is voluntary, the users can opt for other alternative medium, if they are not satisfied with its quality. However, this behavioural usage can be altered if they are provided with sufficient support, which could help in reducing their cognitive efforts when using the system. This study has also expanded the existing literature on digital library by investigating this issue from the perspective of military setting. Since success factors of IS are not universal, and are depending on the contexts, the success of digital library in military setting is found to be different from the rests. The findings of this study highlight the importance of organisational support in a form of training and education, digital library environment and communication support in sustaining the continued usage of digital library. These supports are required to promote a sense of familiarity with the system, so that the usage barriers could be reduced. In the context of military setting, these supports are pertinent considering the diverse background of the military personnel. The system may appear complex for those military personnel who are not “*technology savvy*”; and these perceptions may affect their behaviours and attitudes towards the system. These findings could help the management of MAF to better understand about the perceptions, requirements and needs of the digital library system. Although the study offers theory and practical contributions, the findings may not be able to be generalised to wider populations of military, since it is focusing on Malaysia context.

APPENDIX

For operationalisation of this study, multiple item measures were used, as follows:

Operationalisation
Training and Education
<p>The kind of training provided to me on how to use the military digital library was comprehensive enough. My level of understanding substantially improved after going through the training program on how to use the military digital library system.</p> <p>The education program on military digital library gave me confidence in using the system. The library representative was knowledgeable in aiding my understanding of the military digital library system.</p>
Digital Library Environment
<p>There is a good library environment for usage of the military digital library at the libraries in the organisation. There is a well-informed guide material to facilitate the use of the military digital library in the organisation. The management of the library assists me with the work researches given to me in the organisation.</p>
Communication Support
<p>There are well-informed circulars informing the usage of the military digital library through the organisation. There is communication support for military digital library user consumption. I am satisfied with the communication support network provided for the military digital library in the organisation. The communication support is also open between users that support the usage of the military digital library.</p>
User Satisfaction
<p>I am content with the performance of the military digital library.</p> <p>I am pleased with the experience of using the military digital library. I am happy with the functions provided by the military digital library. I am satisfied with the overall experience of using the military digital library.</p>
Net Benefit-Organisational Impact
<p>The military digital library system has easier round the clock access as compared to the traditional library. The military digital library system is time-saving as compared to the traditional library.</p>
Net Benefit-Individual Impact
<p>The military digital library system is convenient for resource sharing in the context of my job.</p>

Continuation of Usage Intention
I intend to continue using the military digital library in the future.
I will use the military digital library on a regular basis in the future.
I will frequently use the military digital library in the future.
My intentions are to continue using the military digital library than traditional library.

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