

An Integration of TAM and D&M Model in the Ministry of Social Affairs and Labor in Kuwait

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Abstract

This study based on TAM and D&M model to examine the Kuwaiti employee performance using the electronic document and records management system (EDRMS) in the Ministry of social affairs and labor. Additionally, this study has proposed the moderating effect of work cooperation on employee performance. Data of 345 employees were collected from Ministry of social affairs and labor in Kuwait. Smart PLS 3.0 was used to analyze the data. Results indicated that perceived ease of use and perceived usefulness have a positive influence on employee performance. However, findings do not support the relationship between system usage and user satisfaction. Additionally, the results show that there is a significant positive moderating effect of work cooperation. This research provides strong evidence for defining the key factors affecting system usage but also in view of its limits. It should be evaluated. Not all the factors affecting the intentions of end-users to use EDRMS have been fully covered. There are major variables, for example, facilitating state and perceived compatibility are important factors that can be covered in future research. This research is an addition to the current literature and the first attempt in this area to the best of authors' knowledge.

Keywords:

Perceived Usefulness, Ease of Use, System Usage, User Satisfaction, Work Cooperation, Employee Performance

1. Introduction

The electronic document and records management system (EDRMS) is "an automated system which supports the creation, use, and maintenance of documents and records in both paper and electronic format with the intention of reaping an efficient organization's workflow and processes" (Yin, 2014). It is used by governments to improve the performance of employees. In 2011, the ministry of social affair and labor (MSAL) in Kuwait began to develop its own EDRMS which was called data automated workflow (DAW) to automate all documents in the ministry (KUNA, 2011). The DAW was designed in a collaboration with The Central Agency for Information Technology (CAIT) to manage and process all internal documents electronically, and to enable store, manage, and retrieve documents by employees more easily.

In 2018, MSAL completed the EDRMS (DAW) project (*Kuwait National Development Plan- New Kuwait*, 2018; Shabban, 2018). However, the completion DAW does not help to improve employee performance. For instance, the global competitiveness report (2018) showed that out of 137 countries, Kuwait ranked 119 in the labor efficiency index and 68 in the technology readiness index (World Economic Forum, 2018). Studies related to EDRMS are limited, and the successful adoption rate of EDRMS is low in public sectors despite of its benefits (Ab Aziz *et al.*, 2017). Thus, this study will examine the performance of Kuwaiti employees as a result of DAW usage in MSAL.

2. Literature Review

The technology acceptance model (TAM) developed by Davis (1989) has been acceptance and been empirically validated by numerous studies as an accurate predictor of system usage and acceptance. It has been used widely to predict the usage of different types of technology such as internet banking (Nasri and Charfeddine, 2012), e-learning (Tarhini *et al.*, 2016), ERP system (Ramayah and Lo, 2007), mobile payment (Mbogo, 2010), and electronic document management system (Mammo, 2012).

Although, the wide use of TAM model in predicting the usage of technology, the model neglected to focus on evaluating the outcome of technology usage such as user satisfaction and performance. Montesdioca & Maçada (2015) highly recommended user satisfaction and performance as constructs to be used in measuring the success of information system. A few studies related to the technology adoption have examined the effect of technology usage on individual performance, and this relationship need to be more investigation (Hou, 2012; Son *et al.*, 2012). Furthermore, past theories and model do not considered the work cooperation as human factor affecting the performance of individuals in public organizations (Pitafi *et al.*, 2018). Work cooperation refers to the level and extent of direct interactions between employees that results in positive outcomes for the organization (Townsend, 2007). It considered to be an important factor in improving team

members performance in public organizations (Zhuge, 2003).

Perceived ease of use (PEOU): Several studies have shown that PEOU plays an important role in the technology adoption (Kucukusta *et al.*, 2015; Ozturk *et al.*, 2016; De Leon, 2019). Davis (1989) defined the PEOU as the extent in which individuals believe that using a specific system would be effort-free. According to Elkhani, Soltani, & Nazir Ahmad (2014) higher PEOU of a mandatory system, can lead to higher perceived usefulness. Additionally, the PEOU can positively influence perceived usefulness in the context of e government (Gefen *et al.*, 2002). A few past studies found no significant positive impact of PEOU on perceived usefulness (Lee & Lehto, 2013). However, the majority of the past studies showed that PEOU has a positive influence on perceived usefulness (Ha and Stoel, 2009; Lee, Hsieh and Hsu, 2011; Kim, 2014; Bhatiasevi and Yoopetch, 2015). Therefore, it can be hypothesized that

H1: PEOU significantly has a positive impact on perceived usefulness

Number of studies had been conducted on the impact of PEOU on actual system usage. In the context of technology adoption, Lee & Kim (2009) found that PEOU does not influence actual usage. However, other scholars found a positive relationship between the PEOU and technology usage (Konradt, Christophersen and Schaeffer-Kuelz, 2006; McFarland and Hamilton, 2006; Elkhani, Soltani and Nazir Ahmad, 2014). Following the majority, the following hypothesis is suggested:

H2: PEOU significantly has a positive influence on actual usage

Venkatesh, Thong, Chan, Hu, & Brown (2011) found that PEOU has no significant impact on user satisfaction. However, in the context of information technology usage, Hong, Thong, & Tam (2006) asserted that PEOU have a significant positive impact on user satisfaction. Furthermore, Dalcher & Shine (2003), and Sun, Tsai, Finger, & Chen (2008) also found that PEOU can be a predictor of user satisfaction. In addition, Rana, Dwivedi, Williams, & Weerakkody (2015) found that PEOU have a positive impact on user satisfaction in the context of e government. This means that the higher the PEOU can lead the higher the satisfaction. Therefore, it can be hypothesized that

H3: PEOU significantly has a positive influence on user satisfaction

Perceived usefulness (PU): PU is considered to be an important factor related to the technology adoption

(Alrajawy *et al.*, 2018; Negahban & Chung, 2014; Mac Callum & Jeffrey, 2013). Davis (1989) defined the PU as the extent to which an individual believes that using a specific system can improve his or her performance. In the context of technology adoption, Lee & Kim (2009) found that PU has a positive impact on system usage. Other scholars have also found that PU is a predictor of actual use of technology (Kripanont, 2007; Norzaidi, Chong, Murali, & Salwani, 2007; McFarland & Hamilton, 2006). Therefore, it can be hypothesized that:

H4: PU significantly has a positive effect on actual usage

Hong, Thong, & Tam (2006) found that PU does not have positive influence on user satisfaction. However, various studies in the literature emphasized the positive influence of PU on user satisfaction (Y. Sun & Mouakket, 2015; S. H. Kim, 2014; Barnes & Vidgen, 2014). In the context of e government, Rana & Dwivedi (2015) indicated that PU is a predictor of user satisfaction. Thus, it is hypothesized that:

H5: PU significantly has a positive effect on user satisfaction

Actual use (US): The actual usage refers to the usage frequency and usage times of the of technology usage (Kim, Chan and Gupta, 2007), and the lack of technology usage can lead to low performance and low productivity (DeLone and McLean, 1992; DeLone and McLean, 2003; Makokha and Ochieng, 2014). A few studies have investigated the impact of technology usage on performance (Hou, 2012; Son *et al.*, 2012), and studies filled this gap was limited (Hou, 2012; Norzaidi *et al.*, 2007; Son *et al.*, 2012). Some studies found that actual usage is not a predictor of performance (Cho *et al.* 2015). However, a numerous number of studies found a positive influence of actual usage on individual performance (D'Ambra and Wilson, 2004; Hou, 2012; D'Ambra, Wilson and Akter, 2013; Makokha and Ochieng, 2014). Actual usage was also found to have a positive impact on user satisfaction. In the context of internet technology, Norzaidi & Mohamed (2009) found a positive influence of actual usage on user satisfaction. Therefore, it can be hypothesized that:

H6: Actual usage significantly has a positive effect on user satisfaction

H7: Actual usage significantly has a positive effect on performance impact

User satisfaction (SAT): is an essential factor in assessing system usage success (DeLone and McLean, 2003). It is defined as user pleasure or displeasure with a current or prior use of system experience (Weerakkody *et al.*, 2016). Mohd Dusd (2008) found that SAT is not predictor of

individual performance. However, a numerous number of scholars found that SAT positively influences individual performance (Fan and Fang, 2006; Wang and Liao, 2008; Son *et al.*, 2012; Makokha and Ochieng, 2014). Thus, it can be hypothesized that:

H8: SAT significantly has a positive effect on performance impact

Work cooperation (CO) has been proposed in a number of empirical studies to have a positive effect on performance (Wageman and Baker, 1997; Zhuge, 2003; Van der Vegt and Van de Vliert, 2005). In the context of technology usage, Wang, Yen, & Huang (2011); and Staples & Webster (2008) found that work cooperation improved the performance employees using enterprise social media (EMS). The existence of work cooperation is required, as it is a key mechanism helping employees to find solutions for work-related problems from coworkers (Hsu, 2017). When work cooperation exist among employees, they would be encouraged to share work related information between them leading to improve their performance (Khaleel *et al.*, 2017). Bar-On (1995) asserted that employees with high level of work cooperation are expected to provide necessary information to one another leading to improve the work performance. In the context of DAW usage in Kuwait, employees are depending on each other to complete their work tasks, and they are required to cooperate with their coworkers within the same ministry and other ministries to complete their work tasks. This indicates that high or low level of work cooperation can have an impact on employees' performance in Kuwait ministries. Therefore, this study introduces the work cooperation as moderating variable between the relationship of DAW usage and employee performance.

H9: With high level of work cooperation the positive relationship between DAW usage and employee's performance will be strengthened.

Employee Performance (PR) refers to the impact of system usage on users in terms of improving productivity, and saving times in performing work tasks (Ifinedo, 2007). previous studies related to the technology have used the intention to use or actual usage as the dependent variable when examining factors affecting the adoption of certain technology system (Iqbal and Qureshi, 2012; Cheung and Vogel, 2013; Cheng, Chen and Yen, 2015), and disregard the outcome of system usage in terms of evaluating performance of users. In the context of the e government adoption, studies showed that evaluating the outcome of system usage in terms of performance is important in measuring system success of e government adoption (Zheng *et al.*, 2012; Alenezi, Tarhini and Sharma, 2015; Stefanovic *et al.*, 2016; Yousef, 2017).

Overview of the proposed research model: TAM model is a useful model in predicting individual's usage of information system, notable studies have applied it to EDRMS adoption (Balogun, Raheem, Abdulrahman, & Balogun, 2019; Herawan & Senses, 2018; M. Lewellen, Hooper, & Oliver, 2014; M. J. Lewellen, 2015; Mammo, 2012; AlShibly, 2014). PU and PEOU in TAM model are important factors in determining success implementation of EDRMS (AlShibly, 2014). This study will apply the TAM as a base model and extended it by addressing the link between DAW usage and individual performance among employees within MSAL. In the context of EDRMS adoption, Yatin *et al.*, (2015) suggested that user satisfaction should be considered as a main construct in EDRMS usage by employees in public sectors. Based on this suggestion, this study examined user satisfaction along with the extended TAM Model (i.e: PU, PEOU, US, SAT, and PR) to determine the employee performance in MSAL. The study will also contribute to examine the moderation effect of work cooperation on the relationship between DAW usage and employee performance. Figure 1 shows the proposed framework.

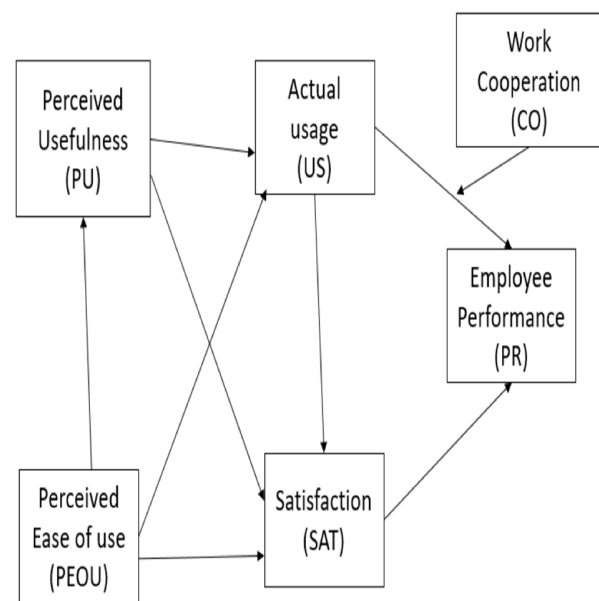


Figure 1 Conceptual Framework of the study
Methodology

Primary data was collected from the employees working in MSAL in Kuwait. The data was collected from three departments of the ministry including administrative, financial and computer. The researchers contacted all three departments through emails, personal visits and telephone and acquired permissions to obtain data collection. As the

population of the employees (users) working in the above-mentioned ministry was unknown therefore non-probability sampling was utilized and 500 questionnaires were distributed to the employees on the basis of their willingness to participate in the study. Further, they were informed that results of the survey would be available to them upon request. Hence, from 500 distributed questionnaires 345

valid responses were returned, resulting in 69% of response rate.

Research instruments

The measurement of the conceptual framework constructs are shown in table 1 below.

Table 1: Research instruments

Construct	Scale	Items No.	Source
PEOU	Five-Point Likert-Scale Ranking from (1) strongly disagree to (5) strongly agree.	3	Huang (2008)
PU	Five-Point Likert-Scale Ranking from (1) strongly disagree to (5) strongly agree.	3	Moon & Kim (2001)
US	Five-Point Likert-Scale Ranking from (1) once a day to (5) once a month	2	Isaac, Abdullah, Ramayah, & Mutahar Ahmed (2017b)
SAT	Five-Point Likert-Scale Ranking from (1) strongly disagree to (5) strongly agree.	3	Isaac, Abdullah, Ramayah, & Mutahar Ahmed (2017b)
PR	Five-Point Likert-Scale Ranking from (1) strongly disagree to (5) strongly agree.	4	Ifinedo, (2007)
CO	Five-Point Likert-Scale Ranking from (1) strongly disagree to (5) strongly agree.	4	Pitafi et al. (2018)

In the demographic information section, respondents in MSAL were categorized by Age, Gender,

Marital status, Education, Department, and Occupation as the following in table 2.

Table 2: Sample characteristics (n=345)

Items	Frequency	Percentage
Age	31-40	74
	41-50	113
	20-30	101
	51-55	57
Gender	Male	179

Marital status	Female	166	48.1
	Single	141	40.9
	Married	204	59.1
Education	High school	46	13.3
	College	50	14.5
	Bachelor	111	32.2
	Masters	82	23.8
Department	PhD	56	16.2
	Administrative Dep.	200	58.0
	Computer Dep.	64	18.6
	Financial Dep.	81	23.5
Occupation	Employee	241	69.9
	Assistant Manager	59	17.1
	Manager	45	13.0

3. Findings and Discussion

The current study assessed the proposed model in two steps which are the assessment of the measurement model (outer model) and the assessment of the structural model (inner model).

Measurement mode

According to Ramayah, Cheah, Chuah, Ting, and Memon (2018) the measurement model is used to examine relationship between the latent variables and their measures (i.e: relationship between variables and their items). It

comprise three main stages which include internal consistency reliability (i.e: composite reliability), indicator reliability (i.e: outer loading), convergent validity (i.e: average variance extracted), and discriminant validity (i.e: Fornell & Larcker's criterion, and HTMT). Table 3 shows that all loading value for all items are above 0.7 as recommended by Hair, Black, Babin, and Anderson (2010). The composite reliability of all variables also exceeded the recommended value of 0.7, and the average variance extracted (AVE) also exceeded recommended value of 0.5 (Hair *et al.*, 2010).

Table 3: Measurement Model (n=345)

Construct	Items	Loading	Cronbach's Alpha	CR	Ave
PEOU	PEOU1	0.907	0.881	0.927	0.808
	PEOU2	0.909			
	PEOU3	0.881			
PU	PU1	0.914	0.915	0.946	0.854
	PU2	0.935			
	PU3	0.924			
US	US1	0.932	0.846	0.929	0.867
	US2	0.93			

SAT	SAT1	0.893	0.912	0.944	0.85
	SAT2	0.932			
	SAT3	0.941			
PR	PR1	0.867	0.847	0.897	0.686
	PR2	0.825			
	PR3	0.835			
	PR4	0.784			
co	CO1	0.787	0.827	0.886	0.66
	CO2	0.882			
	CO3	0.819			
	CO4	0.758			

The result of discriminant validity was explained by table 4 and 5. As shown in Table 4, the correlations for each variable was less than the square root of the average variance extracted by the indicators suggesting adequate discriminant validity (Fornell and Larcker, 1981). Table 5

showed the all the recommended values of HTMT were below 0.85 suggesting adequate discriminant validity (Kline, 2015).

Table 4: Fornell & larcker’s criterion

	PR	US	SAT	PEOU	PU	CO
PR	0.828					
SAT	0.585	0.931				
SAT	0.248	0.199	0.922			
PEOU	0.501	0.357	0.256	0.899		
PU	0.614	0.605	0.301	0.421	0.924	
CO	0.622	0.589	0.221	0.612	0.574	0.813

Table 5: HTMT

	PR	US	SAT	PEOU	PU	CO
PR						
US	0.688					
SAT	0.277	0.224				
PEOU	0.576	0.413	0.284			
PU	0.695	0.687	0.328	0.465		
CO	0.737	0.706	0.254	0.718	0.661	

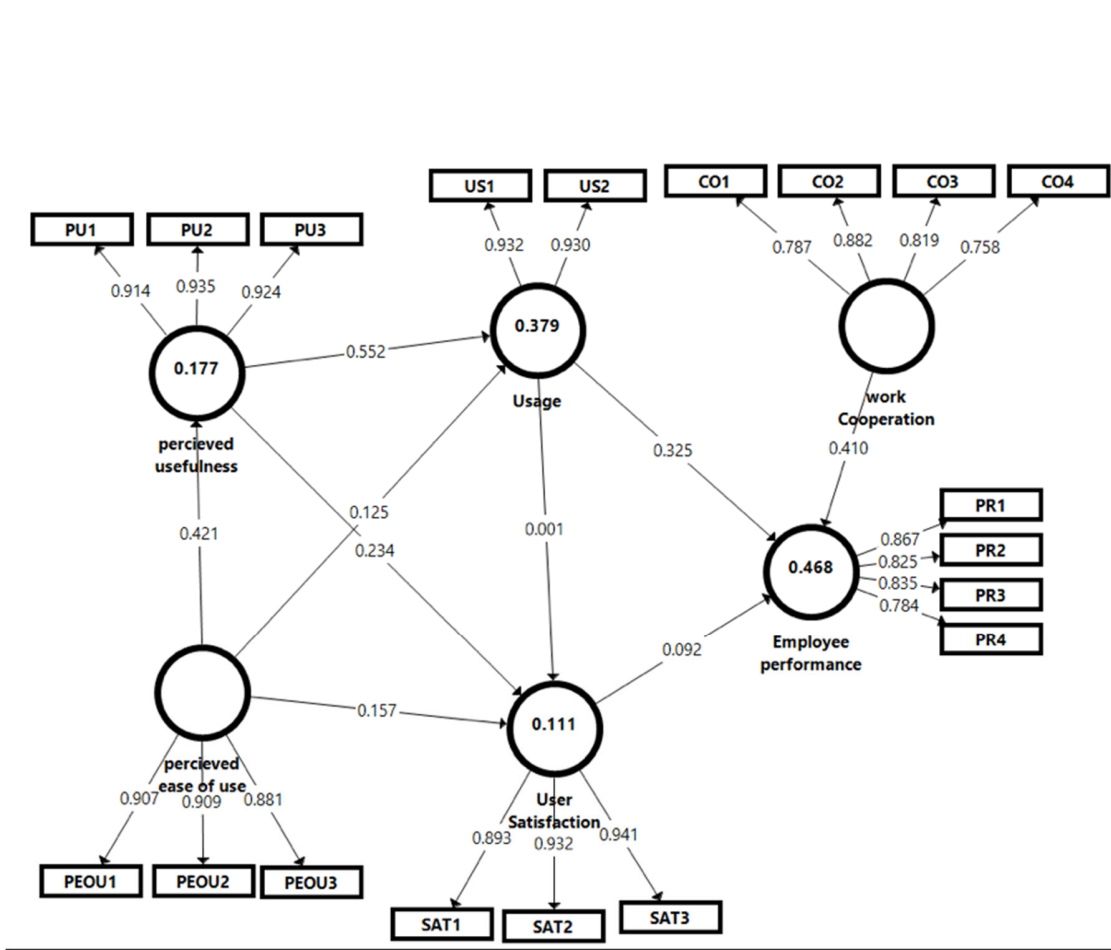


Figure 2 Measurement model of the study

(B)Structural model

The structural model is used to estimate the significance of path coefficient for hypotheses testing (i.e: relationship between variables). According to Ramayah et al. (2018), the assessment of structural model includes (1) structural model for collinearity issues using variance inflation factor (VIF), (2) significance and relevance of the structural model relationships using 5000 bootstrapping procedure, (3) coefficient determination (R^2), (4) level of effect size (f^2) (5) predictive relevance (Q^2). Table 6 showed that 8 hypothesizes were supported, and only one hypothesis was rejected. The result revealed that the effect of US to PR ($\beta = 0.325$, t-value 5.975), SAT to PR ($\beta = 0.092$, t-value 2.26), PEOU to US ($\beta = 0.125$, t-value 2.385), PEOU to SAT ($\beta = 0.157$, t-value 2.812), PEOU to PU ($\beta = 0.421$, t-value 9.248), PU to US ($\beta = 0.552$, t-value 12.14),

PU to SAT ($\beta = 0.234$, t-value 3.39), and the moderating effect of work cooperation on the relationship between US and PR ($\beta = 0.111$, t-value 2.551), were positive. Therefore, H1, H2, H3, H4, H5, H7, H8, H9 are supported. However, the effect of US to SAT ($\beta = 0.001$, t-value 0.016), was not supported.

Table 6 shows acceptable level of the variance inflator factor (VIF) with value less than 3.3 for all relationship (Diamantopoulos and Sigauw, 2006). The effect size in table 5 shows that H2, H3, H5, H7, H8, and H9 showed small effect size, H1 showed medium effect size, H4 showed substantial effect size, and H6 showed no effect size (Cohen, 1988).

Table 6: Structural model

Hypothesis	Beta	Std. Error	t-Values	P-Values	Result	BCILL	BCIUL	F ²	VIF
H1 PEOU-PU	0.421	0.046	9.248	0.000	supported	0.346	0.497	0.216	1.000
H2 PEOU-US	0.125	0.052	2.385	0.009	supported	0.040	0.212	0.021	1.216
H3 PEOU-SAT	0.157	0.056	2.812	0.002	supported	0.067	0.251	0.022	1.241
H4 PU-US	0.552	0.046	12.140	0.000	supported	0.476	0.626	0.404	1.216
H5 PU-SAT	0.234	0.069	3.390	0.000	supported	0.119	0.347	0.036	1.707
H6 US-SAT	0.001	0.067	0.016	0.493	Not supported	-0.107	0.110	0.000	1.610
H7 US-PR	0.325	0.054	5.975	0.000	supported	0.236	0.413	0.129	1.543
H8 SAT-PR	0.092	0.041	2.260	0.012	supported	0.025	0.159	0.015	1.060
H9 CO(US-PR)	0.111	0.044	2.551	0.006	supported	-0.192	-0.081	0.023	1.009

Table 7 shows R² of all constructs suggesting weak value of SAT (0.111), moderate value of PU (0.177), and substantial value for US (0.379), and PR (0.468) (Cohen, 1988). Q²

value was acceptable for all constructs suggesting value more than 0 (Stone, 1974).

Table 7: R² and Q²

Construct	R ²	Q ²
PR	0.468	0.3
US	0.379	0.313
SAT	0.111	0.086
PU	0.177	0.143

4. Discussions

In this study, PEOU was hypothesized to have a positive impact on PU, and this hypothesis was supported. Hence, it is suggested that when DAW system is easy to be used, this can help users to have accurate information from the DAW system and perform critical tasks. This result is supported by Elkhani, Soltani, & Nazir Ahmad (2014) who found that higher PEOU of a mandatory system, can lead to higher PU. The PEOU was hypothesized to have a positive influence on DAW usage, and this hypothesis was supported. Therefore, it is suggested that when DAW system is easy to be used, this can help to improve DAW usage. This outcome is supported by Elkhani et al. (2014) who found that the higher PEOU of a system, can lead to improve a system usage. The PEOU was hypothesized to have a positive influence on SAT and this hypothesis was supported. The finding suggested that when DAW system is easy to be used, users would be satisfied using the DAW system. This finding also supported by Rana, Dwivedi,

Williams, & Weerakkody (2015) who found that PEOU have a positive impact on SAT in the context of e government.

The PU was hypothesized to have a positive influence on SAT, and this hypothesis was supported. The results suggested that when the DAW system helps users to have accurate information from the DAW system and perform critical tasks, users would be satisfied using the DAW system. Rana & Dwivedi (2015) supported this result as they found that PU can positively impact on SAT.

The DAW usage was hypothesized to have a positive influence on both SAT and PR. The finding supported the positive influence of DAW usage on employees' performance. However, the positive influence of DAW usage on user satisfaction was not supported. The findings suggested that the use of DAW system can improve the performance of employees, but it would not positively influence SAT. The finding align with Ghazali & Purwanto

(2016) who found a positive influence of Actual usage on PR. whereas, the finding shows contradictory result of Hou (2012); and Khayun and Ractham (2011) who found positive influence of Actual usage on SAT. This is because Kuwaiti employees had observed increase in their performance but the satisfaction cannot be achieved yet as there are many factors which are associated with users' satisfaction alone system usage cannot predict their satisfaction.

SAT was hypothesized to have a positive influence on PR, and this hypothesis was supported. This result suggested that when DAW users are satisfied with the DAW system, their performance would be improved. Makokha & Ochieng (2014) supported this finding as they found that SAT can enhance PR.

Work cooperation was hypothesized to have a moderation effect on the positive relationship between DAW usage and employees' performance, in a way that high level of work cooperation would improve the employee performance, and this hypothesis was supported. This result suggested that the high level of work cooperation can strength the performance of employees using DAW system. Therefore, it can be argued that high level of work cooperation is important to improve the performance of employees using DAW system in MSAL and labor.

5. Practical Implication

In terms of practical contribution this research contributes in several ways. The aim of EDRMS is to facilitate e-government initiatives through improved communication, access to information and data sharing. Several factors are driving MSAL to institute EDRMS initiatives. One of the key elements is cost reduction. EDRMS initiatives are being driven by budgets and funding. Through sharing information and processes, government agencies may reduce IT costs and streamline procedures that allow people to access information over the internet.

This research provide clear insight to policy makers for the successful EDRMS implementation. EDRMS initiatives have certain technical challenges in place, including the lack of common standards and functional technology between departments and agencies. ICT infrastructure is recognised to be one of the main challenges for EDRMS. Intranetworking is needed to allow for efficient information sharing and to open new contact and access networks for new services (Ndou, 2004). Decision makers and managers should provide better infrastructure to the employees for the smooth implementation and adaptation of EDRMS.

Lastly but not least, major challenge of EDRMS initiative is the lack of ICT skills. This is a particular problem in countries who are still in the process of adopting EDRMS, where there has been a consistently lack of qualified employees and inadequate training in human resources for years. The availability of adequate knowledge is necessary for the successful implementation of EDRMS. It requires human capacities: technological, commercial and management. Technical skills for implementation, maintenance, designing and installation of ICT infrastructure, as well as skills for using and managing online processes, functions and customers, are compulsory. To address human capital development issues, knowledge management initiatives are required focusing on staff training in order to create and develop the basic skills for EDRMS.

6. Limitation and future suggestions

This research provides strong evidence for defining the key factors affecting EDRMS but also in view of its limits. It should be evaluated. Firstly, not all the factors affecting the intentions of end-users to use EDRMS services have been fully covered. There are major variables, for example, facilitating state and perceived compatibility are important factors that can be covered in future research. Secondly, the research model and hypotheses were tested, using data drawn only from a single ministry and the results are therefore limited to one ministry in Kuwait. In order to generalise the results, the study may be expanded to other government settings. Lastly, the cross-sectional nature of this research may inhibit the testing of causality between the constructs included in the research model. Thus, longitudinal studies using causal research designs would be useful. To ensure robust results, these views should be considered in a future study.

7. Conclusion

Finally, based on the findings of this study, the implementation of EDRMS will certainly strengthen the governance basis, thus it can run more effective, efficient, accountable, and it also improves public services by the apparatus. Furthermore, it will help the Government to determine priority for the infrastructure completion and the development of applications and systems that are essential to be implemented immediately in all ministries in Kuwait. In the end, it is expected that the development and implementation of EDRMS can be accelerated, and therefore significantly improve Kuwait's e-Government services.

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