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THE IMPACT OF TASK TECHNOLOGY FIT ON EMPLOYEE JOB PERFORMANCE

Abstract. *In today's dynamic global business economy, the use of information technology has become an essential and pervasive technique for organizational success. In this essence, the present study extends the unified theory of acceptance and use of technology with task technology fit to see how underpinned factors impact on employee intention to adopt information technology and enhance employee job performance. In order to test the proposed research model, the respondent's observations are required. Therefore, an administrative survey was conducted towards Saudi public organizations. A survey questionnaire was distributed among middle-level managers working in HR departments of Saudi Public organizations. In response to administrative survey 398 questionnaires were returned with a response rate of 79.6%. Among 398 questionnaires 38 were discarded due to inappropriate answers and 358 questionnaires were finally used for structural equation modelling. The inclusion criterion was that HR managers must have knowledge about online services offering by respective organizations to employees. For data analysis, structural equation modelling approach was used. Results indicate that the extended the unified theory of acceptance and use of technology model has substantial power and explained* R^2 *77.0% variance in employee intention to adopt the technology. The effect size analysis* (f^2) *showed that within extended model effort expectancy was the most important factor. The predictive relevance* Q^2 *of the model was also adequate. Finally, importance of performance matrix analysis suggested that managers and policymakers should focus on effort expectancy, task characteristics, technology characteristics and supervisor support to boost employee intention to adopt technology and employee job performance.*

Keywords: employee job performance, innovation valance, intention to adopt technology, moderating analysis, structural equation modelling, supervisory support.

Introduction. The use of information technology has become an essential and pervasive technique which is being used by individual, organizations and countries for their growth and prosperity. According to (Isaac, et al., 2019) asserted that internet technology has changed the organizational learning and implementation process. Several other studies revealed that the use of information technology in organizations augment employee productivity and job performance (Al-Alawi & Al-Bassam, 2019; Samar Rahi, et al., 2020). Therefore, the diffusion of information technology is at its initial stages and organizations have failed to adopt information technology (Al-Alawi & Al-Bassam, 2019; Samar Rahi et al., 2020). Thus, the present study extends the unified theory of acceptance and use of technology (UTAUT) with task technology fit (TTF) in order to examine how underpinning factors impact on employee intention to adopt information technology and enhance employee job performance. The extension of the unified theory of acceptance and use of technology is in line with (Samar & Abd. Ghani, 2019; Samar & Mazuri, 2019). A unified theory of acceptance and use of technology was introduced by (Venkatesh, et al., 2003) and incorporate four core factors namely performance expectancy, effort expectancy, social influence and facilitating condition.

The unified theory of acceptance and use of technology is extended in employee intention to adopt technology and employee job performance context with task technology fit theory (TTF). Previous studies have confirmed a significant influence of task technology fit factors on employee intention and productivity (Oliveira, et al., 2014; Tam & Oliveira, 2016; Zhou, Lu, & Wang, 2010). According to (Goodhue and Thompson,1995) task technology model helps individual to understand information system and individual performance. Thus, the current study incorporates two main constructs of task technology fit namely task

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characteristics and technical characteristics. Aside from unified theory extension, the moderating role of supervisor support was also added between employee intention to adopt technology and employee job performance. Thus, factors underpinned two well-known information system (IS) theories including UTAUT and TTF were investigated in employee intention to adopt technology and job performance context. This study significantly contributes to information system literature and provides a guideline to managers and policymakers that how to enhance employee productivity and performance while using information technology in public sector organizations.

Literature Review. Unified Theory of Acceptance and Use of Technology (UTAUT). There are several research models that discuss information system and technology adoption trend among users. These models include technology acceptance model (TAM), the theory of Reasoned Action (TRA) and theory of planned behaviour (TPB) (Ajzen, 1991; Davis, et al., 1989; Fishbein & Ajzen, 1975). According to (Venkatesh, et al. 2003) postulated that earlier theories have been conducted in voluntarily context and ignored the organizational context. Thus, it is important to introduce a unified theory which focuses on organizational adoption view instead of individual user adoption. In this essence, Venkatesh et al. (2003a) piloted longitudinal field research in mandatory context and introduced a new theory namely unified theory of acceptance and use of technology (UTAUT). The unified theory of acceptance and use of technology incorporates four exogenous constructs namely performance expectancy, effort expectancy, social influence and facilitating condition. According to Venkatesh et al. (2003a) performance expectancy, effort expectancy, social influence and facilitating condition have a significant influence on employee intention to adopt the technology. The detail of these variables is given in the following sections.

Performance Expectancy (PER). Performance expectancy is described as «the degree wherein an individual believes that using the system will help him/her to attain gains in job performance» (Samar Rahi, 2019; Venkatesh et al., 2003b). In organizational context performance expectancy is seen as employees performance expectation while using of organizational online system (Ling Keong, et al., 2012; Virdyananto, et al., 2016). A study conducted by (Brown, et al., 2010) investigates employee behaviour towards the adoption of technology in Finland and revealed that performance expectancy is significantly influenced by employee intention to adopt the technology. It is argued that the more employee expects performance while using technology, the more likely that they will adopt the existing technology (Venkatesh & Davis, 2000). Therefore and backup with (Brown et al., 2010; Ling Keong et al., 2012; Venkatesh & Davis, 2000; Virdyananto et al.,2016; Samar Rahi,2019; Venkatesh et al., 2003) performance expectancy is proposed as:

H1: Performance expectancy has a positive effect on employee intention to adopt the technology.

Effort Expectancy (EEX). Effort expectancy is defined as «the degree of ease associated with the use of the system» (Venkatesh et al., 2003b). According to (Brown et al., 2010) postulated that in technology adoption context effort expectancy is the extent wherein user expect that use of information system will be free of effort. Similarly, earlier studies have confirmed that if technology use takes less effort, the more user intention is towards the adoption of information technology (Brown et al., 2010; Venkatesh et al., 2003b). Authors like Brown et al. (2010) had confirmed the direct influence of effort expectancy on employee intention to adopt the technology. According to Zhou et al. (2010) verified that when the user feels that use of technology is easy and does not require much effort, they would have high chances to adopt information system. Thus, effort expectancy is hypothesized as:

H2: Effort expectancy has a positive effect on employee intention to adopt the technology.

Social Influence (SIN). Within the unified theory of acceptance and use of technology social influence is outlined as the third most important exogenous construct that influence on user intention to adopt the technology. Social influence is defined as «the degree where an individual perceives that important others believe he/she should use the new system» (Venkatesh et al., 2003a). It is said that individual intention is influenced by the surrounding people and environment (Samar Rahi, 2019). Thus, it is projected that an

employee can influence others to use the information system. A study conducted by (Ling Keong et al.,2012) clearly showed a significant impact of social influence on user intention to adopt the technology. Therefore, it is confirmed that social influence positively influences on employee intention to adopt information system (Brown et al., 2010; Ling Keong et al., 2012; Samar Rahi, 2019; Venkatesh et al., 2003b). Hence, we derived the following hypothesis:

H3: Social Influence has a positive effect on employee intention to adopt the technology.

Facilitating Conditions (FCC). The construct facilitating conditions is seen as «the degree to which an individual believes that an organizational and technical infrastructure exists to support the use and use of information system» (Venkatesh et al., 2003a). In an organizational context, (Ling Keong et al., 2012) confirmed the significant impact of facilitating condition on employee intention to adopt information technology. There are also some other studies that highlight the importance of facilitating condition in the adoption of technology (Martins, et al., 2014; Venkatesh, et al., 2012). The author like (Ling Keong et al., 2012) stated that employee who are new they need guidance and technical assistance to use information technology. It is also argued that organization having technical infrastructure for initial usage have more chance that employee will adopt the technology (Ling Keong et al., 2012; Venkatesh et al., 2012; Martins et al., 2014). Therefore and following the above arguments we proposed facilitating condition as:

H4: Facilitating conditions has a positive effect on employee intention to adopt the technology.

Task technology fit theory (TTF). The importance of task technology fit theory is highlighted in earlier studies (Oliveira et al., 2014; Tam & Oliveira, 2016; Zhou et al., 2010). According to (Goodhue and Thompson,1995) task technology model helps individual to understand information system and individual performance. This study incorporates two main constructs of task technology fit namely task characteristics and technical characteristics. The detail of these constructs is described in the following sections.

Task Characteristics (TAC). The first construct of task technology fit is task characteristics and defined as «the actions carried out by individuals in turning inputs into outputs» (Goodhue & Thompson, 1995). Task technology fit model claims that the user will only accept information technology if it is useful and improve his/her performance. Authors like (Oliveira et al.,2014) postulated that task characteristics directly link to user actions to perform a task using the information system. It is also stated that task technology fit model roots embedded in information success dimensions and directly influence user behaviour to adopt the technology(Zhou et al., 2010). Earlier studies have confirmed a significant relationship between task characteristics and employee intention to adopt internet technology (Oliveira et al., 2014; Tam & Oliveira, 2016; Zhou et al., 2010). Thus, task characteristic in information system context is proposed as:

H5: Task characteristic has a positive effect on performance expectancy.

H6: Task characteristic has a positive effect on effort expectancy.

H7: Task characteristic has a positive effect on employee intention to adopt the technology.

Technology Characteristics (TCC). The second construct of task technology fit model is technology characteristics (Goodhue, 1995). Technology characteristics is defined as «technology which is used by individuals to perform their tasks» (Goodhue & Thompson, 1995). Earlier studied have confirmed a strong linkage between technology characteristics and use of internet technology in organizations (Oliveira et al., 2014; Tam & Oliveira, 2016; Zhou et al., 2010). A recent study conducted by (Tam and Oliveira,2016) confirmed that technology characteristics influence on user intention to adopt technology and enhance job performance. Similarly, (Oliveira et al.,2014) had integrated unified theory of acceptance and use of technology and task technology fit model. The results of (Oliveira et al.,2014) revealed the substantial impact on user intention to adopt technology while using TTF & UTAUT factors. Following the above arguments we derived the following hypothesis:

H8: Technology Characteristic has a positive effect on performance expectancy.

H9: Technology Characteristic has a positive effect on effort expectancy.

H10: Technology Characteristic has a positive effect on employee intention to adopt the technology.

Innovation Valance (INV). Innovation valance is defined as «the degree wherein employee shows a positive attitude towards adoption of information technology» (Armenakis, et al., 2007; Lokuge, et al., 2018). Innovation valance is actually represented three perspectives of user behaviour namely motivation, empowerment and attitude (Lokuge et al., 2018). According to (Lokuge et al.,2018) employee motivation, positive attitude and empowerment are the core factors that influence employee intention to adopt technology at an organizational level. It is also said that motivation may be elevated looking at dynamic changes in the industry (Lokuge et al., 2018). Similarly, employee positive attitude motivates them to adopt an information system. Finally, the empowerment dimension reflects that the employee has direct access to the information system in the organization. The present study concludes these three dimensions into innovation valance and examines the role of innovation valance in employee intention to adopt information technology in the organizational context. Previous literature established that innovation valance had a significant influence on user intention to adopt the technology (Armenakis et al., 2007; Lokuge et al., 2018; Ozturk, et al., 2017; Sarker, Valacich, & Sarker, 2005). Hence, the following hypothesis is derived:

H11: Innovative valance has a positive effect on employee intention to adopt the technology.

Intention to adopt technology and employee job performance. There are several studies that used intention to adopt technology as an outcome variable to investigate the role of technology in organizational operations (Brown et al., 2010); (Martins et al., 2014; Samar and Mazuri, 2019). However, contrary to traditional studies the present study augments the body of knowledge in information system research by incorporating employee job performance as an outcome variable. In this study employee job performance is predicted by employee intention to adopt information technology and in line with previous literature (Ahmad & Marinah, 2013; Dewett, 2007; Ha & Lo, 2018; Hanaysha, 2016; Hirst, Van Dick, & Van Knippenberg, 2009; Lockwood, 2007; Marsick & Watkins, 1999; Wang & Noe, 2010). Employee job performance is described as «the extent wherein system usage increases the quality of work by helping to complete the task quickly, allow control over work, improve job performance, eliminate errors and boost effectiveness on the job» (Makokha & Ochieng, 2014; Wang & Liao, 2008). Earlier studies have confirmed that individual intention to adopt technology impact on employee job performance impact (Daud Norzaidi, et al.,2007; Hung, Sun, and Yu,2015; Ioimo and Aronson,2003; Makokha and Ochieng,2014; Wang and Liao,2008; Yen, et al.,2010). Thus, employee job performance is proposed as:

H12: Employee intention to adopt technology has a positive effect on employee job performance.

Supervisory Support and employee job performance. In organizational context supervisor support is wherein employee difficulties, task organizations, scheduling accommodation, family needs, ideas and advice are carefully acknowledged by the supervisor for employee well-being (Bergiel, et al., 2009). There are several factors that influence on employee job performance therefore the role of supervisor support is essential for employee performance (Bergiel et al., 2009). Supervisor support has been identified an important factor that influences on employee job performance (Bergiel et al., 2009; Hanaysha, 2016; Marsick & Watkins, 1999; Mohammad Ali, 2018). According to (Hanaysha,2016) postulated that attractive place and supervisor support enhance employee satisfaction and boost employee job performance. Therefore, the current study extends the body of knowledge in this context and underpinned supervisor support as a moderating variable. Supervisor support is proposed between the relationship of employee intention to adopt technology and employee job performance in such a way that the positive relationship between employee intention to adopt technology and employee job performance will be stronger when supervisory support is higher. Earlier studies have confirmed that supervisor support influence on employee intention to adopt information technology and employee job performance (Aldholay, et al., 2018; Bandura, et al., 1999; Choi, 2004; Makokha & Ochieng, 2014; Samar Rahi & Abd. Ghani, 2018; Tierney & Farmer, 2002; Y.-S. Wang & Liao, 2008; Yu, 2012). Thus, supervisor support is hypothesized as:

H13: The positive relationship between intention to adopt technology and employee job performance will be stronger when supervisory support is higher.

Methodology and research methods. Instruments development. The research model as shown in Figure 1 is based on a quantitative research approach and needed to be analyzed with statistical approaches. In this essence, a data set is required for inferential analysis. Thus, a survey questionnaire was developed which contains two types of questions including demographics and scale items. The demographic part of the questionnaire includes the respondent's age, gender and education. The second part of the questionnaire includes instrument items to measure the respondent's observations. All scale items were adopted from literature and then adapted into the current research context. In addition to that scale, items were measured using a seven-point Likert scale ranging 1 for «strongly disagree» to 7 for «strongly agree» (Rahi, 2017). Measurement items for performance expectancy, effort expectancy, social influence, and facilitating conditions were adopted from (Samar Rahi et al., 2019) and then adapted into employee job performance setting. Construct items for intention to adopt technology were adopted from (Samar Rahi,2019) and then adapted into the current research context. Concerning with task technology fit theory (TTF), both constructs items including task characteristics and technology characteristics were adopted from (Daud Norzaidi et al., 2007) and then adapted into current research context. Innovative valance items were adopted from (Lokuge, et al., 2019) and later adapted in the organizational scenario. Measurement items for a construct such as supervisor support were adapted from (Bergiel et al., 2009). Finally, items scales for employee job performance were adopted from (Bergiel et al., 2009). The reliability and validity of these items were tested with structural equation modelling (SEM).

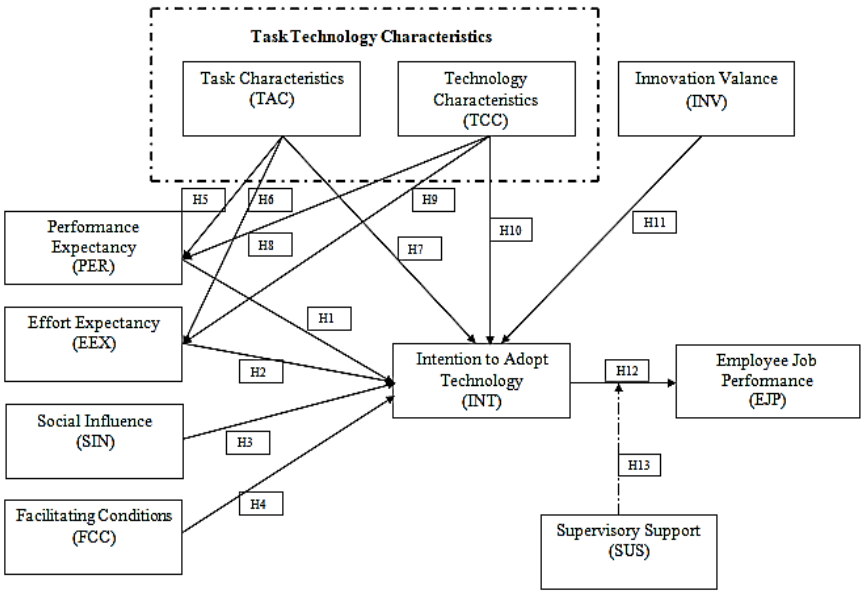

Figure 1. The proposed research model

Data collection and sampling. In order to test the proposed research model, the respondent's observations are required. Therefore, an administrative survey was conducted towards Saudi public organizations. A survey questionnaire was distributed among middle-level managers working in HR departments of Saudi Public organizations. The inclusion criterion was that HR managers must have knowledge about online services offering by respective organizations to employees. The overall objective was to identify the role of technology on employee job performance. Prior to questionnaire distribution,

sample size was selected following guideline argued (S Rahi,2017) that study aims to conduct factor analysis is required to have 300 sample size.

To achieve an appropriate number of responses 500 questionnaires were distributed among HR managers of Public sector organizations in Saudi Arabia. For questionnaire distribution convenience sampling approach adopted. According to (R. Samar and Mazuri, 2019b) convenience sampling approach is appropriate to be taken into consideration wherein a list of the respondents are not available in advance. In addition to that convenience sampling approach helps to obtain correct observation from actual respondents (Samar Rahi et al., 2020). Another advantage of a convenience sampling approach is veracity in data set which reveal interesting findings (Samar Rahi & Abd. Ghani, 2019b). In response to administrative survey 398 questionnaires were returned with a response rate of 79.6%. Among 398 questionnaires 38 were discarded due to inappropriate answers in line with (Samar Rahi and Abd. Ghani, 2019c) and 358 questionnaires were finally used for structural equation modelling.

Common method variance bias (CMV). The current study is based on quantitative research method which further followed the positivist paradigm. Thus it is important that research should be free from any error or common method variance biases. Common method variance bias occurs when data is collected using a single source both for endogenous and exogenous variables. Therefore, the present study test common method variance bias using Harman's single factor test (Podsakoff, et al., 2003). According to (Podsakoff et al., 2003) the maximum co-variance explained by the first factor should be less than 50%. Results showed that the maximum co-variance explained by the first factor was only 23.19% which is less than the threshold value of 50% (Podsakoff et al., 2003). These findings confirmed that the current study data set is free from common method variance bias and appropriate for structural equation modelling.

Results. The research model is tested with structural equation modelling (SEM). Structural equation modelling (SEM) «is a statistical technique for testing and estimating causal relations using a combination of statistical data and qualitative causal assumptions» (S. Rahi, 2017; R. Samar & Mazuri, 2019a). For structure equation model estimation, a two-stage approach was used as suggested by (S. Rahi,2017) and (Anderson and Gerbing,1988). The first stage evaluates construct reliability and validity and known as a measurement model. Therefore, the second stage is entitled structural model and estimate constructs path in order to accept or reject a hypothesis. For structural equation model computation Smart PLS 3.2.8 software is used (S. Rahi, 2017; Ringle, Wende, & Becker, 2015).

Measurement model. The measurement model includes an assessment of construct reliability, indicator reliability, convergent validity and discriminant validity of the constructs. Construct reliability the values of Cronbach's (α) and Composite Reliability (CR) were estimated. Therefore, the convergent validity of the construct was tested with the average variance extracted (AVE). In order to achieve construct reliability, the criterion is that the values of Cronbach's alpha and composite reliability should be greater than 0.70 as suggested by (S. Rahi,2017). Findings of the PLS algorithm showed that all constructs alpha values and composite reliability were greater than threshold values 0.70 thus confirming construct reliability. For indicator reliability criterion is that indicator loadings should be greater than 0.60 as recommended by (S. Rahi,2017). Results showed that all indicator loadings were greater than 0.60, and confirmed adequate reliability of the indicators. In addition to that, the convergent validity of the constructs was checked with average variance extracted following criterion that the values should be greater than 0.50 following guideline provided by (Fornell and Larcker,1981b) and (S. Rahi,2017). Results showed that all the values of AVE were greater than threshold values 0.50, indicated sufficient convergent validity of the constructs.

Table 1 showed the results of the measurement model which includes values of Cronbach's Alpha (α), Composite reliability (CR), factor loadings and average variance extract (AVE) values of the constructs.

Table 1. The measurement model

Constructs items	Loadings	(α)	CR	AVE
Effort Expectancy (EEX)				
EEX1: In my organization my interaction with information system would be clear and understandable.	0.976	0.968	0.979	0.941
EEX2: In my organization learning to operate information system would be easy for me.	0.958			
EEX3: In my organization it is easy for me to become skillful by using information system.	0.975			
Employee Job Performance (EJP)				
EJP1: Using technology my task quickly accomplished	0.941	0.894	0.934	0.826
EJP2: Using technology my work quality improved	0.874			
EJP3: Using technology my job performance improved	0.910			
Facilitating Conditions (FCC)				
FCC1: I have the resources necessary to use the information system.	0.801	0.802	0.871	0.628
FCC2: Information system is compatible with other technologies I use.	0.776			
FCC3: I have the knowledge necessary to use the information system.	0.811			
FCC4: A specific person is available for assistance of information system difficulties.	0.781			
Intention to Adopt Technology (INT)				
INT1: I intend to use information system in the next months.	0.856	0.856	0.912	0.776
INT2: I plan to use information system in the next months.	0.892			
INT3: I predict I would use information system in the next months.	0.895			
Innovation Valance (INV)				
INV1: I am usually the first to try out new information technologies.	0.847	0.775	0.853	0.594
INV2: If I heard about a new information technology, I would look for ways to experiment with it.	0.776			
INV3: If I heard about a new human resource information system, I would look for ways to experiment with it.	0.766			
INV4: I like to experiment with new human resource information system technologies.	0.684			
Performance Expectancy (PER)				
PER1: In my organization information system is useful to carry out my tasks.	0.905	0.899	0.929	0.767
PER2: I think that using information system would increase my productivity.	0.866			
PER3: I think that using information system would improve my performance.	0.872			
PER4: I think that using information system would enable me to conduct tasks more quickly.	0.860			
Social Influence (SIN)				
SINF1: People who are important to me think that I should use Information System.	0.867	0.881	0.927	0.808
SINF2: People in my environment who use Information System services have a high profile.	0.929			
SINF3: Having Information System services is a status of symbol in my company environment.	0.899			

Continued Table 1

Constructs items	Loadings	(α)	CR	AVE
Supervisory Support (SUS)				
SUS1: In my organization my supervisor praises employees who do well work.	0.816	0.798	0.882	0.713
SUS2: My supervisor praises those who prefer to use information system.	0.834			
SUS3: My supervisor praises employee who are good in use of human resource information system	0.882			
Task Characteristics (TAC)				
TAC1: Using information system I often handle the ad hoc and non-routine jobs.	0.910	0.890	0.923	0.750
TAC2: Using information system I often deal with a high difficulty level task.	0.840			
TAC3: Using information system I often get the business questions that never been asked before	0.939			
TAC4: I often get the business questions that never been asked before and it enhance my job performance	0.763			
Technology Characteristics (TCC)				
TCC1: I feel online information system provide real time services	0.822	0.920	0.944	0.808
TCC2: I feel online information system easily accessible at any time required	0.948			
TCC3: I feel human resource information system provide a secure service.	0.931			
TCC4: I feel online information system provide a secure service to employees.	0.888			

Note: CR = (Square of the summation of the factor loadings) / [(square of the summation of the factor loadings) + (square of the summation of the error variances)] AVE = (summation of squared factor loadings) / (summation of squared factor loadings) (summation of error variances).

Sources: developed by the authors.

In order to examine whether constructs items show a distinct concept to differentiate one construct with another construct the discriminant validity of the construct was checked. According to (Samar Rahi and Abd. Ghani,2019a) construct should be discriminant to achieve construct validity. The discriminant validity of the constructs can be examined in three ways including Fornell and Larcker criterion, Cross loadings and Heterotrait-Monotrait Ratio (HTMT). At first, this study estimates the discriminant validity of the constructs following criterion suggested by (Fornell and Larcker,1981a). This method suggested that «the square root of AVE should be greater than the correlations between the constructs indicate adequate discriminant validity of the constructs» (Fornell & Larcker, 1981a). The results of the discriminant validity can be seen in Table 2 which showed that the square root of average variance extracted (bold) was greater than the correlations between the constructs and confirmed that construct was discriminant.

Earlier studies argued that Fornell and Larcker's criterion is not satisfactory to confirm discriminant validity of the constructs (Samar Rahi & Abd. Ghani, 2018b; S Rahi, et al., 2018). Thus another method namely cross-loadings was used to confirm whether construct discriminant or not. In order to achieve adequate discriminant validity of the constructs using cross-loading method, the criterions is that indicator's outer loadings should be higher than the other constructs loadings (Fornell & Larcker, 1981a). Findings of the measurement model revealed that indicator's outer loadings (in italic) are higher than the

other constructs loadings which indicate that discriminant validity of the constructs. The results of the cross-loadings are depicted in Table 3.

Table 2. Discriminant validity using Fornell and Larcker's criterion

#	EEX	EJP	FCC	INT	INV	PER	SINF	SUS	TAC	TCC
EEX	**0.970**									
EJP	0.281	**0.909**								
FCC	0.351	0.244	**0.792**							
INT	0.774	0.405	0.436	**0.881**						
INV	0.030	0.039	0.082	0.150	**0.770**					
PER	0.510	0.362	0.306	0.659	0.099	**0.876**				
SINF	0.323	0.214	0.223	0.459	0.002	0.298	**0.899**			
SUS	-0.019	0.133	0.012	-0.020	-0.001	0.057	0.016	**0.844**		
TAC	0.297	0.317	0.227	0.467	0.106	0.460	0.273	0.053	**0.866**	
TCC	0.287	0.210	0.147	0.437	0.108	0.380	0.182	-0.104	0.254	**0.899**

Note: Bold values indicate the square root of AVE of each construct.
Sources: developed by the authors.

Table 3. Cross loadings criterion

#	EEX	EJP	FCC	INT	INV	PER	SINF	SUS	TAC	TCC
EEX1	**0.976**	0.283	0.328	0.755	0.041	0.528	0.306	-0.018	0.299	0.292
EEX2	**0.958**	0.270	0.348	0.752	0.000	0.472	0.315	-0.028	0.294	0.271
EEX3	**0.975**	0.265	0.344	0.744	0.046	0.482	0.319	-0.009	0.269	0.270
EJP1	0.254	**0.941**	0.242	0.350	0.023	0.324	0.188	0.112	0.244	0.153
EJP2	0.259	**0.874**	0.219	0.418	0.056	0.374	0.213	0.108	0.376	0.280
EJP3	0.252	**0.910**	0.201	0.329	0.024	0.279	0.179	0.145	0.232	0.128
FCC1	0.291	0.262	**0.801**	0.360	0.066	0.256	0.166	0.007	0.146	0.166
FCC2	0.283	0.212	**0.776**	0.335	0.056	0.272	0.161	0.009	0.125	0.159
FCC3	0.293	0.195	**0.811**	0.337	0.044	0.223	0.187	-0.015	0.198	0.062
FCC4	0.244	0.102	**0.781**	0.347	0.092	0.220	0.192	0.036	0.249	0.077
INT1	0.913	0.269	0.364	**0.856**	0.101	0.573	0.332	-0.035	0.319	0.342
INT2	0.545	0.435	0.379	**0.892**	0.146	0.567	0.413	0.014	0.471	0.435
INT3	0.562	0.374	0.410	**0.895**	0.152	0.602	0.473	-0.029	0.452	0.380
INV1	0.053	0.024	0.063	0.145	**0.847**	0.061	-0.001	0.057	0.101	0.071
INV2	-0.032	0.067	0.103	0.105	**0.776**	0.065	0.032	0.029	0.061	0.145
INV3	0.035	0.019	0.053	0.120	**0.766**	0.089	-0.015	-0.079	0.086	0.087
INV4	0.026	0.012	0.027	0.076	**0.684**	0.105	-0.011	-0.030	0.075	0.023
PER1	0.607	0.275	0.261	0.586	0.054	**0.905**	0.224	0.029	0.333	0.315
PER2	0.320	0.383	0.289	0.592	0.147	**0.866**	0.287	0.069	0.495	0.387
PER3	0.351	0.363	0.299	0.592	0.087	**0.872**	0.347	0.053	0.476	0.312
PER4	0.545	0.222	0.212	0.532	0.045	**0.860**	0.164	0.046	0.273	0.309
SINF1	0.329	0.208	0.202	0.415	-0.001	0.276	**0.867**	0.035	0.284	0.134
SINF2	0.279	0.181	0.213	0.422	-0.016	0.275	**0.929**	0.010	0.239	0.188
SINF3	0.261	0.189	0.185	0.399	0.023	0.252	**0.899**	-0.001	0.212	0.170
SUS1	-0.022	0.116	-0.005	-0.030	0.010	0.051	0.017	**0.816**	0.031	-0.093
SUS2	0.023	0.105	0.031	0.020	0.037	0.067	0.009	**0.834**	0.058	-0.094
SUS3	-0.045	0.115	0.006	-0.036	-0.046	0.029	0.015	**0.882**	0.046	-0.078
TAC1	0.245	0.280	0.209	0.395	0.104	0.387	0.201	0.063	**0.910**	0.221
TAC2	0.354	0.278	0.242	0.493	0.090	0.477	0.327	0.045	**0.840**	0.224
TAC3	0.229	0.294	0.171	0.411	0.114	0.396	0.231	0.049	**0.939**	0.265

Continued Table 3

#	EEX	EJP	FCC	INT	INV	PER	SINF	SUS	TAC	TCC
TAC4	0.136	0.239	0.135	0.248	0.047	0.277	0.130	0.019	**0.763**	0.145
TCC1	0.374	0.128	0.138	0.376	0.095	0.349	0.161	-0.093	0.140	**0.822**
TCC2	0.228	0.228	0.151	0.435	0.112	0.351	0.156	-0.091	0.286	**0.948**
TCC3	0.240	0.227	0.115	0.414	0.087	0.345	0.184	-0.091	0.262	**0.931**
TCC4	0.162	0.173	0.122	0.331	0.095	0.312	0.152	-0.099	0.226	**0.888**

Sources: developed by the authors.

More recently Heterotrait-Monotrait Ratio (HTMT) method was introduced by (Kline, 2011) and Gold and Arvind Malhotra (2001) to check the constructs discriminant validity. According to (Samar, et al. ,2017) Fornell and Larcker's criterion and cross-loading method may appropriate in a data set where data set had achieved normality. Therefore, if the data is not normal it is important to compute the discriminant validity of the construct using Heterotrait-Monotrait Ratio (HTMT) (Samar et al., 2017). In order to achieve Heterotrait-Monotrait Ratio (HTMT), the criterion is that HTMT values should be less than HTMT 0.85 or 0.90 as suggested by (Kline,2011) and (Gold and Arvind Malhotra,2001). Results of Heterotrait-Monotrait Ratio revealed that all HTMT values were less than HTMT 0.85 or 0.90 (Kline,2011) and Gold and Arvind Malhotra (2001). These findings confirmed that constructs have adequate discriminant validity to measure a distinct concept.

Table 4 shows the values of Heterotrait-Monotrait Ratio (HTMT).

Table 4. Heterotrait-Monotrait Ratio (HTMT)

Variable	EEX	EJP	FCC	INT	INV	PER	SINF	SUS	TAC	TCC
EEX	NA									
EJP	0.302									
FCC	0.398	0.286								
INT	0.840	0.463	0.526							
INV	0.054	0.050	0.106	0.178						
PER	0.557	0.392	0.356	0.748	0.120					
SINF	0.349	0.240	0.265	0.530	0.030	0.327				
SUS	0.041	0.158	0.050	0.045	0.080	0.067	0.029			
TAC	0.300	0.347	0.258	0.514	0.121	0.484	0.289	0.061		
TCC	0.296	0.227	0.169	0.490	0.125	0.412	0.202	0.122	0.274	NA

Note: Heterotrait-Monotrait Ratio (HTMT) discriminate at (HTMT <0.9/ HTMT <0.85).
Sources: developed by the authors.

Structural model. The measurement model confirmed the validity and reliability of the constructs therefore the significance of the relationship between the exogenous variable and endogenous variable is tested with a structural model. Structural model assessment includes evaluation of lateral multicollinearity, path-coefficients using beta values β, and corresponding t-values. In addition to that, the variance explained in the endogenous variable was also estimated with the coefficient of determination R^2. The lateral multicollinearity of the construct was estimated with variance inflation factors (VIF). The author like (S Rahi, et al., 2018) argued that the assessment of multicollinearity is important to make sure that the hypothesized relationship between two constructs is causally related and measure the same construct.

In order to confirm whether the underpinned constructs had adequate lateral multicollinearity, the values of variance inflation factors (VIF) were estimated following criterion that the variance inflation factors values should be less than 3.3 as recommended by (Samar Rahi, et al., 2019). Findings of the structural model revealed that all the VIF values with corresponding endogenous and exogenous variables

were greater than 3.3, confirmed that lateral multicollinearity is not a significant issue in this study. The results of lateral multicollinearity using variance inflation factors (VIF) are exhibited in Table 5.

Table 5. Lateral Multicollinearity Assessment

Constructs	EEX	EJP	INT	PER
Effort Expectancy (EEX)			1.499	
Employee Job Performance (EJP)				
Facilitating Conditions (FCC)			1.192	
Intention to Adopt Technology (INT)		1.000		
Innovation Valance (INV)			1.026	
Performance Expectancy (PER)			1.699	
Social Influence (SIN)			1.187	
Supervisory Support (SUS)		1.000		
Technology Characteristics (TCC)	1.069		1.325	1.069
Task Characteristics (TAC)	1.069		1.203	1.069

Sources: developed by the authors.

Hypothesis testing. The hypothesized relationships were examined with path coefficient, standard deviations, t-values and significance level. In order to compute t-statistics help was taken from a bootstrapping procedure. Bootstrapping analysis was conducted with re-sample 3,000 as suggested by (Rahi, 2018). Table 6 exhibits the results of hypotheses including path coefficient, standard deviations, t-values and the significance level of the proposed relationship.

Table 6. Results of hypothesis

Hypothesis	Relationship	Direct effect (β)	SE	T-statistics	Result
H1	PER -> INT	0.216	0.046	4.740***	Supported
H2	EEX -> INT	0.504	0.046	10.942***	Supported
H3	SINF -> INT	0.153	0.032	4.730***	Supported
H4	FCC -> INT	0.108	0.028	3.925***	Supported
H5	TAC -> PER	0.388	0.049	7.912***	Supported
H6	TAC -> EEX	0.239	0.051	4.666**	Supported
H7	TAC -> INT	0.110	0.039	2.852**	Supported
H8	TCC -> PER	0.282	0.055	5.087***	Supported
H9	TCC -> EEX	0.226	0.056	4.029***	Supported
H10	TCC -> INT	0.130	0.034	3.862***	Supported
H11	INV -> INT	0.078	0.026	2.982**	Supported
H12	INT -> EJP	0.408	0.059	6.974***	Supported

Note: *p<0.05; **p< 0.01; ***p< 0.001 (one-tailed).

Sources: developed by the authors.

The results of the structural equation modelling indicate that user intention to adopt technology is jointly predicted by performance expectancy, effort expectancy, social influence, facilitating condition, task characteristics, technology characteristics and innovation valance and explained $R^2$77% variance in employee intention to adopt the technology. On the flip side employee job performance was predicted by intention to adopt technology and supervisor support and explained R^2 20.6% variance in employee job performance. Findings revealed that performance expectancy significantly influences on intention to adopt technology and statistically significant H1: (β= 0.216, t-value 4.740, significance p< 0.001). Effort expectancy had shown significant influence on the intention to adopt technology and supported by H1:

(β=0.504, t-value 10.942, significance p< 0.001). Similarly, social influence and facilitating condition had positive and significant influence on intention to adopt technology (β= 0.153, t-value 4.730, significance p< 0.001; β= 0.108, t-value 3.925, significance p< 0.001) hence, confirming H3 and H4. Concerning with task technology fit, findings showed that both constructs task characteristics and technology characteristics had a significant relationship with intention to adopt the technology. Task characteristics significantly influence on performance expectancy, effort expectancy and intention to adopt technology and supported by (β= 0.388, t-value 7.912, significance p< 0.001; β= 0.239, t-value 4.666, significance p< 0.001; β= 0.110, t-value 2.852, significance p< 0.001) thus, confirming H5, H6 and H7.

In addition to that technology characteristics had significant influence on performance expectancy, effort expectancy and intention to adopt technology supporting by (β= 0.282, t-value 5.087, significance p< 0.001; β= 0.226, t-value 4.029, significance p< 0.001; β= 0.130, t-value 3.862, significance p< 0.001), confirming H8, H9, H10. Results also revealed that innovation valance had a significant influence on the intention to adopt technology in the organization and supported by H11: (β=0.078, t-value 2.982, significance p< 0.001). Finally, the relationship between intention to adopt technology in organizations and employee job performance was tested. Results showed that intention to adopt technology had a significant influence on employee job performance and supported by H12: (β=0.408, t-value 6.974, significance p< 0.001). Thus, the results of the structural equation model showed that the extension of a unified theory of acceptance and use of technology with task technology characteristics was appropriate to examine employee intention to adopt technology and employee job performance.

Estimation of effect sizes (f^2), predictive relevance Q^2. The causal relationship between constructs is confirmed with structural model however the effect size of these relationships is yet to be studied. Therefore, the present study estimates effect size analysis using (f^2) analysis. In structural model coefficient of determination R^2 explained total variance in endogenous variable therefore, effect size analysis shows individual effect size of each exogenous variable on the endogenous variable. Author like Cohen (1988) «p-value can show you whether an effect exists or not therefore it does not illustrate the size of the effect». Thus, it is important to examine the effect size impact of each construct to determine the importance of the variables. As the current study extends the unified theory of acceptance and use of technology with task technology fit theory, it is important to investigate the predictive relevance of the newly developed model. The predictive relevance of the model is assessed with blindfolding procedure Q^2 in line with earlier studies (Hair, et al., 2016); (Rahi, 2015). In order to achieve adequate predictive relevance of the research model the values of Q^2 should be greater than 0 indicate appropriate predictive relevance of the model. Table 7 exhibits the results of the effect size (f^2) analysis, predictive relevance Q^2 and coefficient of determination R^2 .

The extended model is confirmed that both theories have a significant impact on employee intention to adopt the technology. As depicted in Table 7 that user intention to adopt technology was jointly predicted by performance expectancy, effort expectancy, social influence, facilitating condition, task characteristics, technology characteristics and innovation valance and explained $R^2$77.0% variance in employee intention to adopt technology, therefore, employee job performance was predicted by intention to adopt technology and supervisor support and explained R^2 20.6% variance in employee job performance. These findings showed that the extension of the unified theory of acceptance and use of technology was valid and showed a substantial impact on employee intention to adopt the technology.

Concerning with effect size analysis (f^2) results showed that among all other exogenous variables effort expectancy had a substantial effect on employee intention to adopt the technology. Therefore, performance expectancy, social influence, facilitating condition, task characteristics, technology characteristics and innovation valance had shown small effect size. In employee job performance context, intention to adopt technology had shown medium effect size therefore supervisor support had shown small effect size when determining the role of employee job performance. Thus, the newly extended unified

theory of acceptance and use of technology model had shown influential results to predict employee intention to adopt technology and employee job performance.

Table 7. Effect size analysis(f^2) and predictive relevance Q^2

Intention to Adopt Technology				
Constructs	R^2	Q^2	(f^2)	Decision
Intention to Adopt Technology	0.770	0.561		
Effort Expectancy (EEX)			0.735	Substantial
Facilitating Conditions (FCC)			0.043	Small
Innovation Valance (INV)			0.026	Small
Performance Expectancy (PER)			0.119	Small
Social Influence (SINF)			0.086	Small
Task Characteristics (TAC)			0.040	Small
Technology Characteristics (TCC)			0.061	Small
Employee Job Performance				
Constructs	R^2	Q^2	(f^2)	Decision
Employee Job Performance	0.206	0.141		
Intention to Adopt Technology (INT)			0.210	Medium
Supervisory Support (SUS)			0.025	Small

Note: f^2: 0.02, Small; 0.15, Medium; 0.35, Substantial.
Sources: developed by the authors.

Importance of performance matrix analysis (IPMA). The current study had a complex research model as it extends the unified theory of acceptance and use of technology (UTAUT) with task technology fit theory (TTF) and innovation valance. Thus, it is important to examine constructs in terms of performance and importance for managerial implications. Actually, the importance of-performance matrix analysis (IPMA) shows the importance and performance of the latent constructs using scores. IPMA scores are derived from rescaling the latent constructs from 0 to 100 in line with Rahi (2017) and Hair Jr, Hult, Ringle, and Sarstedt (2016). IPMA analysis contains two types of values including total effects or importance scores and performance scores. For IPMA analysis criterion is that the outcome variable should be selected earlier to analysis. Thus, in this study researcher selected employee job performance as an outcome variable for IPMA analysis. The values of importance (total effect) and performance scores (Index Values) of the variables are exhibited in Table 8.

Table 8. IPMA Total effects and performance

Latent Constructs	**Importance (Total effect of the latent variable Employee Job Performance)**	**Employee Job Performance (Index values)**
Effort Expectancy (EEX)	0.201	71.316
Facilitating Conditions (FCC)	0.049	70.735
Intention to Adopt Technology (INT)	0.442	67.413
Innovation Valance (INV)	0.021	77.757
Performance Expectancy (PER)	0.096	59.743
Social Influence (SINF)	0.065	63.214
Supervisory Support (SUS)	0.165	60.358
Task Characteristics (TAC)	0.133	61.452
Technology Characteristics (TCC)	0.128	60.103

Sources: developed by the authors.

Findings of the IPMA analysis indicates that the newly developed extended unified theory of acceptance and use of technology model has adequate importance and performance value to measure employee job performance. Therefore, within an extended unified theory of acceptance and use of technology model, employee intention to adopt technology had the highest importance value to determine employee job performance. Therefore, employee effort expectancy during the use of the online system had shown the second most important construct. Concerning other constructs such as supervisor support, facilitating condition and social influence had lease importance when determining the role of employee job performance. Concerning with task technology fit theory constructs, results showed that both construct technology characteristics and task characteristics had an intermediate level of power to examine employee job performance. It is worth to note that facilitating condition had a high performance therefore for managerial implication it may be not important construct. The results of IPMA analysis are depicted in Figure 2.

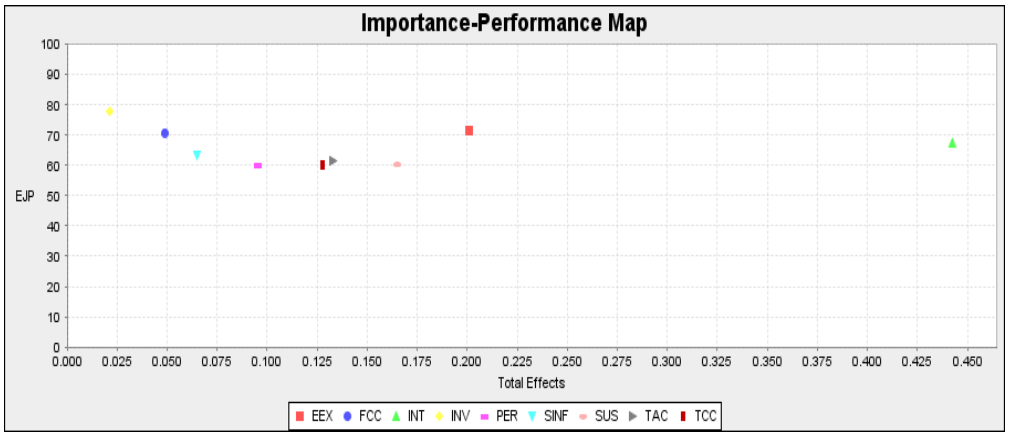

Figure 2. Importance performance matrix analyses map

The importance-performance map as shown in Fig.2 IPMA depicts that for managerial implications, employee intention to adopt technology and employee expectation towards effort (effort expectancy) were the most influential factors when determining the role of employee job performance. Therefore, performance expectancy, task characteristics, technology characteristics and supervisor support had an intermediate level of importance in the extended model. Thus, for managerial implication, it is suggested that manager and policymakers should focus on effort expectancy, task characteristics, technology characteristics and supervisor support to enhance employee intention towards the adoption of technology and employee job performance in public sector organizations.

Moderating analysis. The research model underpinned supervisor support as a moderator variable that moderate the relationship between employee intention to adopt technology and employee job performance in public sector organization. The researcher hypothesized that «the positive relationship between intention to adopt technology and employee job performance will be stronger when supervisor support is higher» For statistical analysis product-indicator approach was used which is in line with (Henseler and Fassott, 2010) and (Samar Rahi, 2016). Product indicator approach is required interaction effect of the independent variable and moderator variable. Thus, the researcher created the interaction-effect of intention to adopt technology and supervisor support to further test a causal linkage between moderator and dependent variable. Findings showed that the interaction effect between intention to adopt internet technology and supervisor support was positive and statistically significant (β = 0.297, t-value

2.174, p<0.01), hence confirmed H13. The result of the moderating effect which includes path coefficient β and t-statistic values are exhibited in Figure 3.

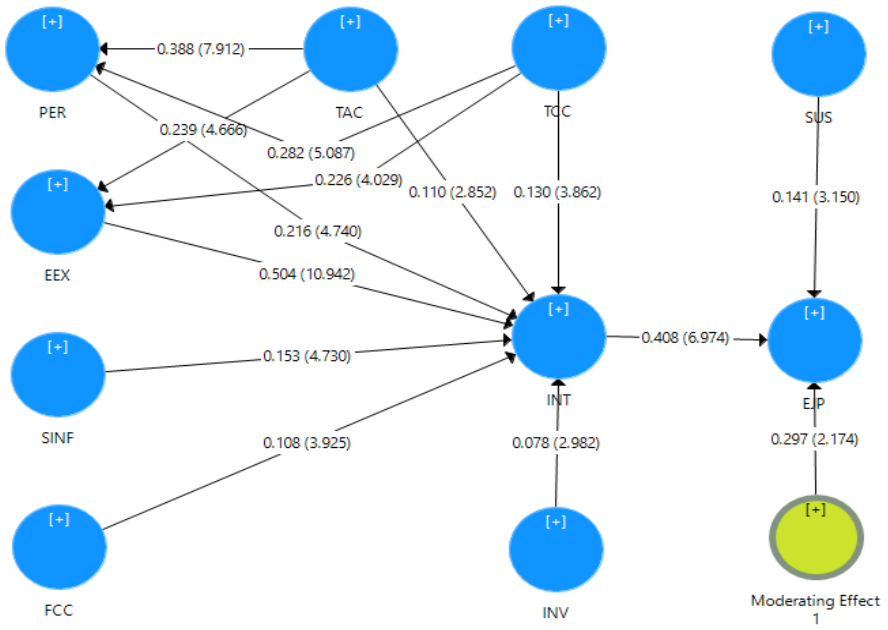

Figure 3. Path coefficients and T-Values

Foremost the moderating relationship of supervisor support between employee intention to adopt technology and employee job performance is statistically confirmed. Therefore, the strength of the moderating relationship whether it is higher or lower yet to be examined. Thus, the researcher took help from simple slope analysis. As stated above this study outlined moderating variable as «the positive relationship between intention to adopt technology and employee job performance will be stronger when supervisor support is higher» is confirmed with simple slope analysis. The simple slope analysis showed a positive trend and described as supervisor support (SUS) at+1SD has steeper and positive gradient when it is compared to supervisor support (SUS) at-1SD (less steep and positive) (Samar Rahi & Ghani, 2016, 2018). This trend explained that the positive relationship between intention to adopt technology and employee job performance will be stronger when supervisor support is higher and confirmed H13. The simple slope analysis is exhibited in Figure 4

This study investigates employee intention to adopt technology in public sector organizations and its impact on employee performance. With the rapid growth of information technology, it is important to investigate how technology impact on employee job performance. Therefore, the present study extends the unified theory of acceptance and use of technology with task technology fit. Findings of the structural equation modelling revealed a significant impact on employee intention to adopt technology and employee job performance. The first construct of UTAUT theory namely performance expectancy significantly influence on intention to adopt technology and in line with (Brown et al., 2010; Ling Keong et al.,2012; Venkatesh and Davis, 2000; Virdyananto et al., 2016; Samar Rahi, 2019; Venkatesh et al., 2003b). Employee effort expectancy had shown significant influence on the intention to adopt technology and in line with (Brown et al., 2010; Venkatesh et al., 2003b). The third and fourth constructs of UTAUT were

also significant. Results showed that social influence and facilitating condition had positive and significant influence on intention to adopt technology and in line with several previous studies (Brown et al., 2010; Ling Keong et al., 2012; Martins et al., 2014; Rahi, 2019; Venkatesh et al., 2003b; Venkatesh et al., 2012).

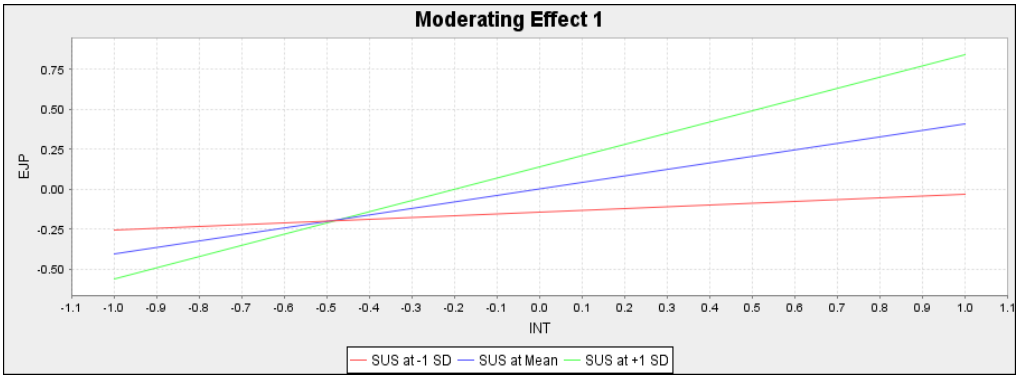

Figure 4. Simple slope analysis for relationship strength

The results of structural equation modelling showed that task characteristics and technology characteristics had a significant relationship with the intention to adopt the technology. Task characteristics significantly influence on performance expectancy, effort expectancy and intention to adopt technology and in line with (Mohammad & Swaiess, 2019; Oliveira et al., 2014; Tam & Oliveira, 2016; Zhou et al., 2010). Extending to these technology characteristics had a significant influence on performance expectancy, effort expectancy and intention to adopt technology and in line with previous studies (Oliveira et al., 2014; Tam & Oliveira, 2016; Zhou et al., 2010). Overall, this study concludes that managers and policymakers should focus on factors underpinned the unified theory of acceptance and use of technology and task technology fit to enhance technology adoption and job performance among public sector employees.

Conclusions. The use of information technology is indispensable for organizational operations. Use of technology not only reduces the operational cost but at the same time it improves employee job performance. In this essence, the current study extends the unified theory of acceptance and use of technology (UTAUT) with task technology fit (TTF) to see how underpinned factors impact on employee intention to adopt information technology and enhance employee job performance. For data analysis, structural equation modelling (SEM) approach is used. Results indicate that the extended UTAUT model has a substantial impact on employee intention to adopt technology and job performance. Employee intention to adopt technology is jointly predicted by performance expectancy, effort expectancy, social influence, facilitating condition, task characteristics, technology characteristics and innovation valance and explained $R^2$77.0% variance in employee intention to adopt technology, therefore, employee job performance was predicted by intention to adopt technology and supervisor support and explained R^2 20.6% variance in employee job performance. These findings showed that the extension of the unified theory of acceptance and use of technology was valid and showed a substantial impact on employee intention to adopt the technology. The effect size analysis (f^2) showed that among all other exogenous variables effort expectancy had a substantial effect on employee intention to adopt the technology. The predictive relevance of the model is assessed with blindfolding procedure Q^2 which indicates that the values of Q^2 are be greater than 0 indicate appropriate predictive relevance of the research model. Finally, managerial implications are suggested using importance-performance matrix analysis. Findings of the Importance of performance matrix analysis revealed that employee intention to adopt technology and effort

expectancy are the most influential factors when determining the role of employee job performance. Thus, for managerial implications, it is recommended that managers and policymakers should focus on effort expectancy, task characteristics, technology characteristics and supervisor support to boost employee intention to adopt technology and employee job performance.

Limitations and future research directions. The present study extends the unified theory of acceptance and use of technology with task technology fit theory (TTF) in order to investigate employee intention to adopt information system in Public sector organization. Although the extension of UTAUT and TTF had shown a substantial impact on employee intention to adopt technology and employee job performance therefore, it has some limitations that are important to acknowledge for future impetus. First, the research model incorporates only government employees in data set adding private sector employee's observation into a data set could reveal interesting findings. Second, the present study is followed by the positivist paradigm and cross-sectional in nature. However, the future researcher may examine this research model in longitudinal and mandatory setting instead of voluntary. Finally, the current research model is tested in Arab countries therefore for research model generalizability the research model could be investigated in other developing regions, for instance, South Asia.

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Вплив інноваційних інформаційно-комунікативних технологій на ефективність роботи працівників

У сучасній динамічній глобальній бізнес-економіці використання інформаційних технологій стає важливим компонентом успіху будь-якої компанії. Зважаючи на це, ця стаття узагальнює аргументи та контраргументи в межах наукової дискусії з питання впливу інноваційних інформаційно-комунікативних технологій на ефективність роботи працівників. Дане дослідження розширює уніфіковану теорію сприйняття та використання технології з постановкою завдання до цієї технології, що дає можливість побачити, як аналізовані фактори впливають на намір працівника прийняти інформаційні технології та підвищити ефективність власної роботи. Для перевірки запропонованої моделі було використане спостереження респондентів. Крім того, було проведене опитування громадських організацій Саудівської Аравії. Анкета була розповсюджена серед керівників середньої ланки, які працюють у відділах з управління персоналом громадських організацій Саудівської Аравії. Критерієм включення респондентів було те, що менеджери з персоналу повинні мати знання про інтернет-сервіси, які пропонують відповідні організації працівникам. Для аналізу даних було використано підхід моделювання структурних рівнянь. Результати показують, що розширена модель має значну потужність і пояснює R^2 77,0% відхилення в намірах працівника прийняти технологію. Аналіз розміру ефекту (f^2) показав, що в межах розширеної моделі тривалість зусиль була найважливішим фактором. Прогнозна відповідність Q^2 моделі також виявилася адекватною. У рамках дослідження надані рекомендації керівникам та розробникам у сфері технологій зосередити увагу на тривалості зусиль, характеристиках завдань, технологічних характеристиках та підтримці від керівників, що дасть можливість підвищити наміри співробітників до прийняття технології та підвищити ефективність роботи працівників.

Ключові слова: ефективність роботи, інноваційність, поширення технологій, модеруючий аналіз, моделювання, супервайзер.

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