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Factors Affecting the Cloud ERP: A Case Study of Learning Resources Department at Jordanian Education Ministry

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Abstract:

Enterprise resource planning (ERP) systems have been used by organizations for years, whereas, Cloud ERP systems gained audience a few years ago both from practitioners and academicians. As such, there is a migration from the traditional ERP to the Cloud ERP system, and employees in most organizations are accustomed to the traditional ERP system. In order to improve the efficiency and effectiveness of the Cloud ERP system used in the operation stage. Organizations need to research the factors that have an impact on users' satisfaction and managerial decision making. There is a great deal of prior studies that measured users' adoption of ERP systems using a technological acceptance model (TAM). Thus, this study also utilized the TAM model in examining the factors that influence users' adoption of Cloud ERP systems. To get the maximum value of the validity and reliability of the findings, the study was conducted in two folds which are pre-implementation and post-implementation. In addition, structural equation modelling was employed to reach the findings. Finally, the study identified the technology factor, employee factor, perceived usefulness and perceived ease of use as important variables for affecting Cloud ERP adoption; and as important antecedents influencing managerial decision making. This study comes to be the first study to employ the TAM

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model in the Cloud ERP area in two waves: pre-post implementation phases. Interestingly, the relationships between the variables in pre and post-implementation do not differ significantly.
Keywords: Cloud ERP, Cloud E-lerrec, TAM model, Managerial decision support, Technology factor, Employee factor, Perceived usefulness, Perceived ease of use.
JEL Code: M15.

1. Introduction

Cloud computing is a new horizon whereby technological resources meant for computing (i.e., processing, memory, and storage) are stored at a different location rather than the user's physical location. More practically, the host or service provider provides these services to the user remotely with the aid of an internet connection (Saini, Saini, Yousif, & Khandage, 2011). From Technicalperspective there are three models (i.e., public, private and hybrid clouds) to present the cloud services (Oracle, 2015). Moreover, to deliver cloud services there are three (3) main approaches namely: Software as a Service (SaaS), Infrastructure as a Service (IaaS), and Platform as a Service (PaaS) as noted by (Oliveira, Thomas, & Espadanal, 2014; Weng, & Hung, 2014).

Along with the emerging demand for mobility and on-demand services, the development of web-based ERP systems has become urgent research and practical agenda; that requires scholarly and practical attention (Wang et al., 2008). Besides the incremental contribution of IS on an organization's performance is a long term, and indirect indicator of success and how effective managerial decisions were (Ruivo, Oliveira, & Neto, 2012). Moreover, the value of IS to business can be observed through system usage (Zhu & Kraemer, 2005), workflow enhancement and profit generation. In their influential study, Peng and Gala (2014) emphasized that there is a gap between cloud computing technology and ERP systems. A careful examination of the literature has shown prior studies related to cloud computing were delineated as a single unit; likewise ERP systems. According to a report prepared by Aberdeen Group in 2013. Moreover, ERP systems might be implemented successfully from a technical perspective, but success depends on ERP users' attitudes toward the system (Kwahk & Lee, 2008).

The present study explores an alternative way to understand and measure IS value by studying Cloud ERP in its *pre-implementation phase and post-implementation phase*. The current study developed a Cloud ERP system called "Cloud E-Learec System" for Queen Rania Center ministry of

education, Jordan. Following Rajan, and Baral (2015) and Ruivo, Oliveira, and Neto, (2012) approach, we developed a model based on the technology acceptance model (TAM), to test the impact of the "Cloud E-Learec System" on employee performance and managerial decision making support.

2. Theoretical Framework and Hypothesis

According to Gelogo and Kim (2014), ERP systems hosted in a platform that can be accessed through the internet is known as Cloud ERP. The cloud is a host site where the ERP applications and data are stored and the computing takes place and the cloud keyword subsumes a broad set of applications and software deployment models (See figure 1). Consequently, Xu (2012) revealed that cloud computing services can be distributed to firms through models namely: (1) Software as a service (SaaS); (2) Infrastructure as a service (IaaS); and (3) Platform as a service (PaaS). Figure 1below depicts the form of ERP we have ranging from traditional, IaaS, PaaS and SaaS ERP. In the traditional model, all fundamental computing resources are maintained and supported by the firm.

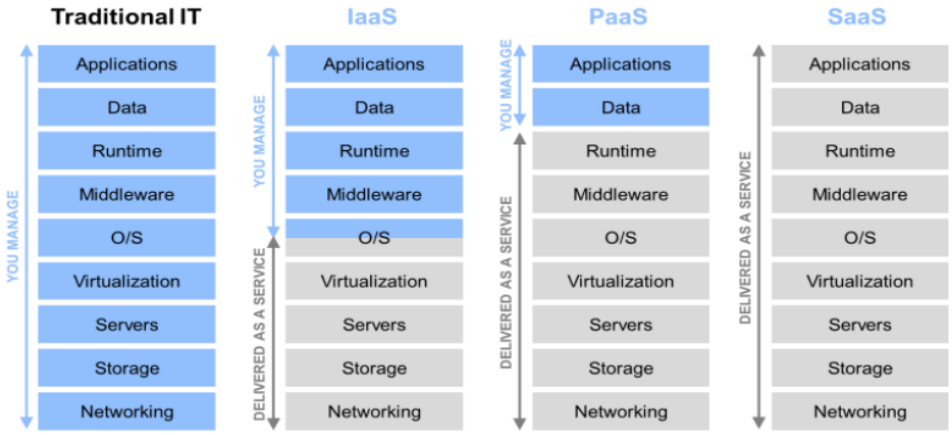

Figure 1: Cloud computing distribution models
Source: (Harms & Yamartino, 2010)

2.1 Technology acceptance model (TAM)

In particular, TAM was built to explain and predict user acceptance of specific types of technology. Some scholars have adopted TAM in various aspects of modern technology ranging from the use of Websites (e.g., Chang & Chung, 2001), Web retailing (e.g., Wang, Lin,& Luarn, 2006), Web browsers (e.g., Morris & Dillon, 1997), online purchase

intentions (e.g., van-der-Heijden, Verhagen, & Creemers, 2003). E-mail (e.g.,Karahanna & Straub, 1999), blog usage (e.g., Hsu & Lin, 2008), Instant Messaging (e.g., Turel, Serenko, & Bontis, 2007),mobile technology (e.g., Hong & Tam, 2006) to ERP (e.g., Sternad & Bobek, 2013).However, there is a scarcity of studies explaining the acceptance of Cloud ERP using the TAM. In this view, this study employed the TAM model in examining the determinant of Cloud ERP.

2.2 Contextual variables affecting the usage of Cloud ERP

- **Technology Factor:** In their influential study Gangwar, Date and Ramaswamy (2015) noted that the technology factor has two-component in the TAM framework; namely compatibility and complexity.
- **Employee factor:** Modern tertiary institution has embraced high-tech (i.e., ERP systems) due to intense competition, heavy workloads and complex tasks. Lin (2010) added that such systems are the elementary mechanisms by which employee's use in providing technical and complicated computerized solutions.
- **Perceived usefulness:** Davis' TAM proposes that "perceived usefulness" and "perceived ease of use" affect "attitude toward usage"; "attitude toward usage" and "perceived usefulness" affect "intention to use"; and finally, "intention to use" affect "usage behaviour". The above-stated relationship has been validated in many research and conference papers (Hsu & Lin, 2008).
- **Perceived ease of use:** According to TAM, potential users' and/or users' perceived ease of use of an ERP system has a positive influence on their intention to use the system and attitude toward the use of the system. The relationship has been tested across different areas related to technology adoption. The above theoretical arguments have been empirically validated by various scholars (Escobar-Rodriguez, Escobar-Pérez, & Monge, 2012).
- **Attitude toward usage:** Prior empirical work focused more on exploring the factors that influence the success and failure of the ERP systems (Santamaría-Sánchez, Núnez-Nickel, & Gago-Rodríguez, 2010)**.**
- **Decision making support:** According to Slevin and Pinto (1987), management support refers to the willingness of top management to provide the required resources and autonomy to employees in any given task. Research has shown that ERP systems are complex and demand rigorous training; thus the need for training is inevitable (Bingi, Sharma, & Godla, 1999). Moreover, the fact that training and

guidance are expected to mitigate anxiety and stress employees may face concerning the use of the ERP system (Lee et al., 2010).

2.3. Hypothesis and Research Model

Relying on the extant literature, this study formulated the following hypotheses based on the aforementioned theoretical and empirical arguments. The hypotheses are also presented in the diagram below (See figure 2).

H1: Technology factor will have a significant impact on employee's perceived usefulness of Cloud E-Learec System both in pre and post-implementation phase.
H2: Technology factor will have a significant impact on employee's perceived ease of use of Cloud E-Learec System both in pre and post-implementation phase.
H3: Employee factor will have a significant impact on employee's perceived usefulness of Cloud E-Learec System both in pre and post-implementation phase.
H4: Employee factor will have a significant impact on employee's perceived ease of use of Cloud E-Learec System both in pre and post-implementation phase.
H5: Employee's perceived usefulness of Cloud E-Learec System will have a significant impact on their attitude towards use both in the pre and post-implementation phase.
H6: Employee's perceived usefulness of Cloud E-Learec System will have a significant impact on decision making support both in pre and post-implementation phase.
H7: Employee's perceived ease of use of Cloud E-Learec System will have a significant impact on their attitude towards use both in the pre and post-implementation phase.
H8: Employee's perceived ease of use of Cloud E-Learec System will have a significant impact on decision making support both in pre and post-implementation phase.

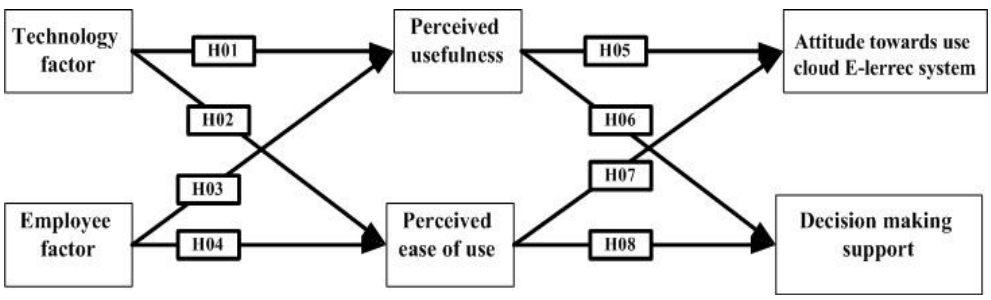

Figure 2. Conceptual model

3. Research Methodology

3.1 Range of Study

This study will collect primary data. Primary data is a kind of data collected from first-hand experience. This study is quantitative because the quantitative method has the ability to produce objective and reliable results, and because the shortcomings of qualitative methods include low sound judgment, predictability and certainty (Abubakar, Ilkan, & Sahin, 2016). Accordingly, this study follows the single group pre-post test design. To achieve the study objectives, a two-wave test approach (pre- post-implementation) will be deployed.

3.2 Measures and research instruments

The response options were anchored on a 5-point scale, ranging from (1) strongly disagree to (5) strongly agree**,** where a higher score indicates a higher level of effecting use the current system.

Technology factor- was measured with 13 items adopted from the following studies (Davis, 1989; Thompson et al. 1991; Compeau & Higgins, 1995; Brown, 2002 Rajan, & Baral, 2015). Moreover, Employee factor - Employee factor was measured with 8 items adopted from the following studies (Davis, 1989; Venkatesh & Davis, 1996). Perceived usefulness -was measured with 10 items adopted from the following studies (Davis, 1989; Davis, Bagozzi, & Warshaw, 1989; Wixom & Todd 2005). In addition, Perceived ease of use - measured with 12 items adopted from the following studies (Davis, Bagozzi, & Warshaw, 1989; Venkatesh, & Davis, 1996; Brown, 2002). Next, Attitude towards use -measured with 5 items adopted from the following studies (Ajzen & Fishbein, 1980; Sumner, & Hostetler, 1999; Ngai, Poon, & Chan,2007). As well as, decision making support - measured with 5 items adopted from the following studies (Al-Mamary, Shamsuddin, & Aziati, 2013). Finally, Demographic variables used include gender, work experience, education and job category.

3.3 Sample plan and size

In this study, a convenience sampling technique was employed in this study. This type of sampling is used by researchers due to ease of access to the subjects. Probably due to proximity, easy to handle or inexpensive and the participants are in house employees. The initial sample consists of 500 employees who voluntarily agree to participate in the study. (Krejcie & Morgan, 1970) found the table for determining the sample size of the known population. The table presents a required sample size for a specific population. Accordingly, the sample size of this study is acceptable.

3.4 Data collection and time frame

In the pre-test fold, data was obtained from employees working in Queen Rania Center attached to the ministry of education in Jordan. The survey items were developed in English and then back-translated to Arabic by two linguistic experts. A total of 500 questionnaires were distributed to the respondents through their respective front offices. Completed questionnaires were sealed in envelopes to make responses anonymous and confidential; this was done to decrease the potential threat of common method bias (Podsakoff et al., 2003). In the end, only 407 questionnaires were returned, resulting in an 81% response rate, and 385 responses were used for analysis due to missing data. The pre-implementation study took about six weeks in total. In the post-test fold, the same procedures applied in the pre-test fold were applied for the study. A total of 463 questionnaires were distributed. In the end, only 379 questionnaires were returned, resulting in an 82% response rate, and 369 responses were used for analysis due to missing data. The post-implementation study took about eight weeks in total.

4. Results

4.1 Demographic Variables

Table 1 presents the demographic breakdown for the post-implementation and pre-implementation sample.

Table 1. Demographic breakdown

	Pre-implementation n=385		Post implementation n= 369	
Category	Frequency	Percentage	Frequency	Percentage
Gender				
Male	187	48.6	248	67.2
Female	198	51.4	121	32.8
Total	385	100	369	100
Experience				
5 years and less than	66	17.1	29	7.9
Between 5 and less than 10	169	43.9	75	20.2
Between 10 and less than 15	97	25.2	104	28.2
15 and greater than	53	13.8	161	43.6
Total	385	100	369	100
Qualification				
Diploma	169	43.9	167	44.4
B.Sc.	90	23.4	82	22.2
High diploma	35	9.1	67	18.2
Master	53	13.8	41	11.1
PhD	38	9.9	15	4.1

Total	385	100	369	100
Job				
Teacher	77	20.0	72	19.5
Computer technician	82	21.3	68	18.4
Science technician	77	20.0	67	18.2
Librarian	74	19.2	64	17.3
Administrative	75	19.5	98	26.6
Total	385	100	369	100

4.2 Confirmatory Factor Analysis

All measures were subjected to confirmatory factor analysis (CFA) to provide support for the issues of dimensionality, convergent and discriminant validity**.** AMOS program was used for structural equation modelling, all the fits for the 6 item model were acceptable as evident in Table 2 and 3 and one item model was used to gauge the potential threats of CMV. The one item model provided poorer fits when compare with the 6 item model. As such, the focal outcome shows that the tendency of CMV does not seem to exist.

Table 2**.** Goodness fit of the 6 item model

Goodness-of-fit indices (Pre-implementation n=385)	Goodness-of-fit indices (post-implementation n=369)	Cut-off points
Chi-square (X2) = 4280.4 df = 1068, ,	Chi-square (X2) = 3574.3df = 1103	p<.001
GFI = .71	GFI = .73	1 = maximum fit (Tanaka & Huba, 1985)
NFI = .75	NFI = .78	1 = maximum fit (Bentler & Bonett, 1980)
CFI = .80	CFI = .83	1 = maximum fit (McDonald & Marsh, 1990)
TLI = .79	TLI = .82	1 = maximum fit (Bentler & Bonett, 1980)
RMR = .023	RMSEA = .078	Values < .06 indicating good fit (Browne & Cudeck, 1993).
CMIN/DF = 3.99	CMIN/DF = 3.24	Values >1 and < 5 were accepted (Marsh & Hocevar, 1985)

Note: df, degree of freedom; GFI, goodness-of-fit indices; NF, Normed Fit Index; CFI, comparative fit index; TLI, Tucker-Lewis index; RMSEA, root mean square error of approximation; CMIN/DF, Relative Chi-square

Table3. Goodness fit of one item model (Pre-implementation n=385)

Goodness-of-fit indices (Pre-implementation n=385)	Goodness-of-fit indices (post-implementation n=369)	Cut-off points
Chi-square (X2) = 9644.7, df = 1080	Chi-square (X2) = 8859.7,df = 1127	p<.001
GFI = .47	GFI = .45	1 = maximum fit (Tanaka & Huba, 1985)
NFI = .43	NFI = .45	1 = maximum fit (Bentler & Bonett, 1980)
CFI = .46	CFI = .48	1 = maximum fit (McDonald & Marsh, 1990)
TLI = .44	TLI = .46	1 = maximum fit (Bentler & Bonett, 1980)
RMR = .025	RMSEA = .137	Values < .06 indicating good fit (Browne & Cudeck, 1993).
CMIN/DF = 8.92	CMIN/DF = 7.86	Values >1 and < 5 were accepted (Marsh & Hocevar, 1985)

Note: df, degree of freedom; GFI, goodness-of-fit indices; NF, Normed Fit Index; CFI, comparative fit index; TLI, Tucker-Lewis index; RMSEA, root mean square error of approximation; CMIN/DF, Relative Chi-square

Next, the mean and standard deviation of the measures used were generated to evaluate the normality, and skewness of the responses. The data seems to have a normal distribution based on the mean and standard deviation values as depicted in the table below. As a next step, the psychometric properties of the scale items was evaluated. Some items from pre and post-construction were deleted due to poor loadings and cross-loading in our CFA. The retained item loadings exceeded .50 as suggested by (Hair et al., 2006). Cronbach's alphas were all above the benchmark of .60; similarly, CR and AVE were also above the benchmark of .70 and .50 as recommended by (Hair et al., 2006); with the exception of perceived ease of use which was below .50. Fornell and Larcker (1981) suggested that if AVE is less than 0.5, but the CR is higher than 0.6, then the convergent validity of the construct is still adequate. Based on this concluded that this does not seem to affect the constructs convergent validity. For further detail see Tables 4 and 5. As a final remark, the current outcome shows convergent and discriminant validity of the study constructs.

Table 4. Mean and Standard deviation of the Measures (Pre- post-implementation)

Pre-implementation			Post- implementation		
Scale items	Mean	S.D	Scale items	Mean	S.D
Technology factor			**Technology factor**		
Item 1	4.55	.51	Item 1	4.54	.52
Item 2	4.51	.60	Item 2	4.51	.61
Item 3	4.59	.50	Item 3	4.60	.50
Item 4	4.42	.66	Item 5	4.60	.50
Item 5	4.60	.50	Item 6	4.52	.53
Item 6	4.53	.53	Item 7	4.53	.57
Item 7	4.55	.55	Item 8	4.52	.60
Item 8	4.52	.64	Item 9	4.60	.52
Item 9	4.62	.52	Item 10	4.64	.51
Item 10	4.67	.50	Item 11	4.64	.50
Item 11	4.64	.52	Item 12	4.60	.50
Item 12	4.62	.49	Item 13	4.59	.51
Employee factor			**Employee factor**		
Item 1	4.63	.57	Item 1	4.63	.46
Item 2	4.69	.47	Item 2	4.68	.47
Item 3	4.67	.54	Item 3	4.69	.47
Item 4	4.70	.53	Item 4	4.62	.46
Item 5	4.61	.58	Item 5	4.67	.47
Item 6	4.67	.56	Item 6	4.73	.47
Item 7	4.73	.46	**Perceived usefulness**		
Perceived usefulness			Item 1	4.60	.49
Item 1	4.59	.50	Item 2	4.57	.51
Item 2	4.57	.50	Item 3	4.63	.52
Item 3	4.62	.55	Item 4	4.61	.49
Item 4	4.62	.54	Item 5	4.64	.51
Item 5	4.67	.51	Item 6	4.65	.50
Item 6	4.61	.59	Item 7	4.63	.55
Item 7	4.67	.47	Item 8	4.66	.49
Item 8	4.67	.51	Item 9	4.68	.50
Item 9	4.68	.48	Item 10	4.66	.48
Perceived ease of use			**Perceived Ease of use**		
Item 1	4.74	.45	Item 1	4.74	.45
Item 2	4.75	.43	Item 2	4.76	.42
Item 3	4.68	.52	Item 3	4.69	.52
Item 4	4.67	.54	Item 4	4.68	.53
Item 5	4.67	.56	Item 5	4.71	.53
Item 6	4.75	.47	Item 6	4.75	.47
Item 7	4.72	.49	Item 7	4.71	.48
Item 8	4.71	.45	Item 8	4.72	.44
Item 9	4.75	.45	Item 9	4.75	.44
Item 10	4.75	.47	Item 10	4.74	.47
Item 11	4.77	.44	Item 11	4.75	.46
Item 12	4.76	.45	Item 12	4.76	.44

Attitude towards use			**Attitude towards use**		
Item 1	4.67	.51	Item 1	4.70	.48
Item 2	4.70	.47	Item 2	4.71	.49
Item 3	4.66	.55	Item 3	4.65	.56
Item 4	4.62	.53	Item 4	4.64	.50
Decision Making Support			Item 5	4.67	.50
Item 1	4.70	.47	**Decision Making Support**		
Item 2	4.67	.48	Item 1	4.72	.46
Item 3	4.74	.46	Item 2	4.71	.48
Item 4	4.64	.50	Item 3	4.76	.45
			Item 4	4.82	.38

Table 5. Psychometrics properties of the measures (Pre-post implementation)

	Pre-implementation			Post- implementation		
Items	**α**	**CR**	**AVE**	**α**	**CR**	**AVE**
Technology factor	.91	.92	.50	.92	.92	.50
Employee factor	. 92	.90	.57	.92	.91	.64
Perceived usefulness	.93	.92	.57	.92	.93	.56
Perceived ease of use	.92	.92	.49	.93	.93	.50
Attitude towards use	.89	.87	.65	.91	.91	.68
Decision making support	.85	.86	.62	.83	.83	.55

Notes: CR, construct reliability; AVE, average variance extracted; α, Cronbach's alpha; Measure of Sampling Adequacy(pre- implementation) = .90; Bartletts'Test of Sphericity (pre- implementation)= 16257.3, df(pre- implementation) = 1128,KMO Measure of Sampling Adequacy(post-implementation) = .91,Bartletts'Test of Sphericity (post-implementation)= 16122.6, df(post- implementation = , 1326 p = .000.

In pre-implementation and post-implementation phases, the KMO measure of sampling adequacy is equal to .90 and .70respectively; above the cutoff point of .70 and .91 respectively, similarly Bartletts'Test of Sphericity is equal to 16257.3 with a degree of freedom equals 1128 and 16122.6 with a degree of freedom equals 1326 respectively, and the sample p-value was significant. This gave us the ground and confidence to carry on with our analyses.

4.3 Structural Equation Model

The figures below represent the structural equation model retrieved from the AMOS program; it also shows the explained variance and the strength of the relationship.

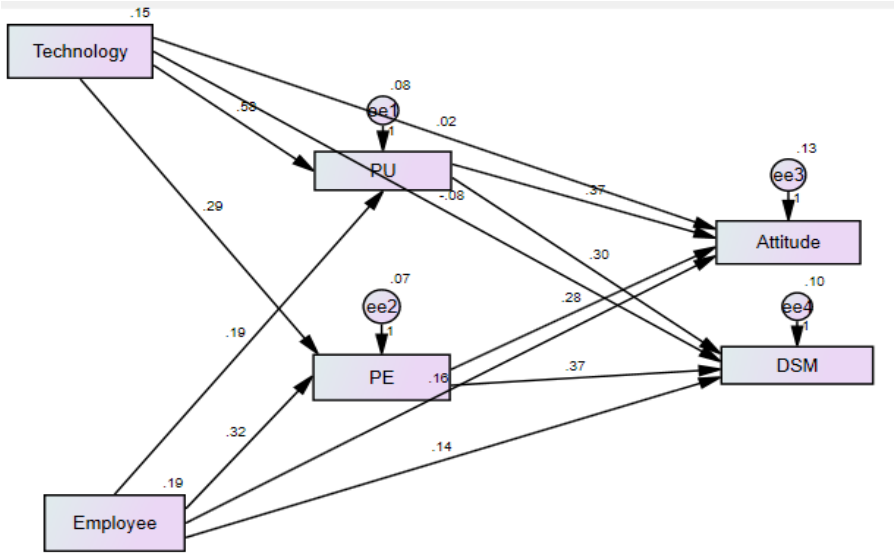

Figure 3. SEM of the research (Pre-implementation)

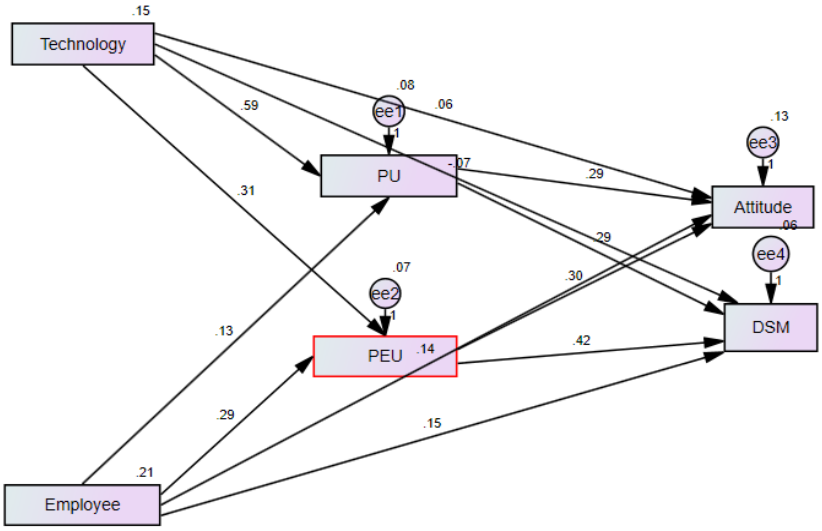

Figure 4. SEM of the research (post-implementation)

Table 6 shows the results of the hypotheses for pre and post-implementation. In addition, table 7 represents the regression coefficients for pre and post-implementation. The coefficients and t-statistics were used in deriving whether a difference exists between the outcome in the pre-implementation phase and the post-implementation phase. The table shows that the strength of the relationship between the proposed variables both in

the pre-implementation phase and post-implementation phase does not differ significantly. This does provide additional robustness for the current findings in two folds. In addition to this, recent research by Abdinnour, & Saeed (2015) shows that studies utilizing pre-implementation and post-implementation approaches can use varying sample sizes.

Table 6. Test hypothesis

Pre-implementation					Post-implementation				
Hypothesis	B	p	R^2	Result	**Hypothesis**	B	P	R^2	result
H1	.585	.000	.47	gained empirical support	**H1**	.591	.000	.44	gained empirical support
H2	.290	.000	.31	gained empirical support	**H2**	.313	.000	.28	gained empirical support
H3	.193	.000	.29	gained empirical support	**H3**	.127	.002	.195	gained empirical support
H4	.322	.000	.35	gained empirical support	**H4**	.288	.000	.30	gained empirical support
H5	.372	.000	.31	gained empirical support	**H5**	.287	.000	.25	gained empirical support
H6	.298	.000	.28	gained empirical support	**H6**	.290	.000	.34	gained empirical support
H7	.282	.000	.27	gained empirical support	**H7**	.300	.000	.25	gained empirical support
H8	.372	.000	.31	gained empirical support	**H8**	.423	.000	.43	gained empirical support

Table 7. Comparison of pre and post implementation samples

Independent Variables	Dependent Variables	β (t) Pre Sample	β (t) Post Sample
Technology factor	Perceived usefulness	.585(15.474)	.591(15.513)
Technology factor		.290(8.254)	.313(8.627)
Employee factor	Perceived ease of use	.193(5.729)	.127(3.884)
Employee factor		.322(10.297)	.288(9.250)
Perceived usefulness	Perceived usefulness Perceived ease of use Attitude towards use	.372(5.929)	.287(4.376)
Perceived usefulness	Decision making support	.298(5.364)	.290(6.303)
Perceived ease of use	Attitude towards use	.282(4.163)	.300(4.344)
Perceived ease of use	Decision making support	.372(6.213)	.423(8.3745)

Notes: *Significant at the $p < 0.05$ level (two-tailed); **significant at the $p < 0.01$ level (two-tailed)

We bootstrapped the model to produce a bias-corrected confidence interval for the standardized parameter estimate as recommended by (Preacher & Hayes, 2004; Shrout & Bolger, 2002), utilizing a validation sample of (n = 2,000). Based on the outcome we concluded that there is a partial mediation between the two constructs through perceived ease of use. Finally, bootstrapping analysis suggests that our sample size is not affecting the current results.

5. Discussion and Conclusion

The purpose of this research work was to validate a model that attempts to understand the determinants of users' attitudes towards use and managerial decision support of Cloud ERP in a tertiary organizational context. More specifically, Queen Rania Center is attached to the ministry of education in Jordan. According to Lee, Lee, Olson and Chung (2010), the key importance of ERP systems is its ability to reduce the time required to complete business operation, facilitate information sharing and provide the organization with an efficient and proper work atmosphere that most employees wish to have (Sternad & Bobek, 2013). This research aimed to improve the understanding of how the influence of technological and employee factors can increase the degree of the attitude of Cloud ERP users toward the ERP system; and how managerial decision support can be

enhanced. This work extended previous TAM research into the Cloud ERP realm.

First, as theorized by TAM technology factor was found to have a positive and significant association with perceived usefulness of Cloud E-Lerrec in both studies (pre and post-implementation phase), this is associated with (Davis, 1989; Stockdale, & Standing 2006). Furthermore, the technology factor was found to have a positive and significant association with perceived ease of use of Cloud E-lerres in both studies (pre and post-implementation phase) as noted by prior studies (MacGregor, & Vrazalic, 2005; Poon, & Swatman, 1999). Our findings show that the employee factor has a positive and significant association with the perceived usefulness of Cloud E-lerres in both studies (pre and post-implementation phases). Prior studies have documented a similar relationship (Davis, 1989; Saadé, & Bahli, 2005; Martins, Oliveira, & Popovič, 2014). Additionally, the employee factor was found to have a positive and significant association with perceived ease of use of Cloud E-lerres in both studies (pre and post-implementation phase). Prior studies have documented similar relationships (Davis, 1989; Hartwick, & Barki, 1994; Iivari, & Ervasti, 1994). Further, perceived usefulness significantly influence users' attitude towards the use of Cloud E-lerres in both study (pre and post-implementation phases), this notion has also been supported empirically by (Braun, 2013). Additionally perceived usefulness significantly influence managerial decision support associated with the Cloud E-lerres system in both study (pre and post-implementation phases), this is agreed with (Hwang, Chang, Chen & Wu, 2008), (Park, Zo, Ciganek, & Lim, 2011), (Al-Mamary, Shamsuddin, & Aziati, 2013). This study also uncovers that perceived ease of use has a positive and noticeable impact on users' attitude towards the use of Cloud E-lerres in both studies (pre and post-implementation phases), this is documented in (Davis, 1989, Nah, Tan, & Teh, 2004; Dembla et al., 2007, Stockdale, & Standing, 2006). Finally, perceived ease of use significantly influences managerial decision support associated with the Cloud E-lerres system in both studies (pre and post-implementation phases).

The study sample size both in the pre and post-implementation phase is somewhat small and does not reveal detailed information on how Cloud ERP is affecting the decision maker's behaviours. This is expected to have more effect and use over time, as such future research on how Cloud ERP technology will influence the decision making of managers would be welcome and insightful. The cross-sectional design of the study might lead to casual interference among the study variables, as such the current outcome should be viewed cautiously. Future studies should adopt a

longitudinal approach and a large sample size to validate the present findings. The findings in this study are associated with a single country and a single sector.

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Appendix

Technology factor
Steps to complete a task in the Cloud E-Learec system follow a logical sequence.
Performing an operation in the Cloud E-Learec system led to a predicted result.
Screens of the Cloud E-Learec system were clearly organized.
The Cloud E-Learec system was characterized by rapid response even at peak times.
The cloud E-learning resources system provided relevant information for work.
The Cloud E-Learec system presented the information in an appropriate format.
The information from the Cloud E-Learec system was up-to-date enough for my purposes.
The reliability of output information from the cloud electronic learning resources system was high.
The Cloud E-Learec system provided the information when I need in time.
The Cloud E-Learec system had a modern-looking interface.
The Cloud E-Learec system provided the right solution to my request.
The Cloud E-Learec system gave me prompt service.
The Cloud E-Learec system had a good interface to meet my needs and labour.
Employee factor
I have the experience to use handled devices (Laptops, tablets, smartphones...).
I have the experience to use the internet.
The Cloud E-Learec system is exactly what I need.
I am sure it was the right thing to adopt the Cloud E-Learec system.
Owning the Cloud E-Learec system has been a good experience.
I am satisfied with the performance of The Cloud E-Learec system service.
I am satisfied with the decision to work over the Cloud E-Learec system.
I am pretty satisfied with the cloud E-learning resources system which has been chosen.
perceived usefulness
Using the Cloud E-Learec system improved the quality of the work I do.
Using the Cloud E-Learec system gave me greater control over the activities in my work.
The Cloud E-Learec system enabled me to accomplish tasks more quickly.
The Cloud E-Learec system supported critical aspects.
The Cloud E-Learec system increased my productivity.
The Cloud E-Learec system improved my job performance.
The Cloud E-Learec system allowed me to accomplish more work than would otherwise be possible.
The Cloud E-Learec system enhanced my effectiveness on the job.
The Cloud E-Learec system made it easier to do my job.
Overall, the Cloud E-Learec system was useful in my job.
perceived Ease of use
Overall, I found the Cloud E-Learec system interface easy to use.
My interaction with the Cloud E-Learec system was clear and understandable.
The Cloud E-Learec system required the fewest steps possible to accomplish what I want to do with it.
Using the cloud E-Learec system is effortless.
I could use the Cloud E-Learec system without written instructions
I did not notice any inconsistencies when I use the Cloud E-Learec system.
I could recover from mistakes quickly and easily over the Cloud E-Learec system.
I could use the Cloud E-Learec system successfully every time.

Learning to use the Cloud E-Learec system interface was easy for me. It was easy for me to become skilful at using the Cloud E-Learec system interface. I found the Cloud E-Learec system interface to be flexible to interact with. I easily remembered how to use the Cloud E-Learec system.
Attitude towards use I had a generally favourable attitude toward using the Cloud E-Learec system. I believed it was a good idea to use the Cloud E-Learec system for my work. I liked the idea of using the Cloud E-Learec system. Using the Cloud E-Learec system provided me with a lot of enjoyment. Overall, I enjoyed using the Cloud E-Learec system.
Decision Making Support The Cloud E-Learec system helped me to make various decisions in the time when I need such as daily decisions making, weekly decisions making, monthly decisions making and annual decisions making. The nature of information in the cloud E-learning resources system supported the decision making. The cloud E-learning resources system provided the reports which assist the decision making. The cloud E-learning resources system allowed me to make the right decisions that relate to my work. Overall, the cloud E-learning resources system improved the decision-making process**.**

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