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## JOB SECURITY AND ERP ACCEPTANCE BY INDIVIDUALS IN SAUDI ARABIA AIR-TRANSPORTATION INDUSTRY

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### ABSTRACT

*Today, internet technologies are considered the most efficient tools assisting companies to grow in the marketplace, enhancing their capability to compete with other competitors and attracting customers to their products and services. It has known that the success or failure of businesses depends on their adoption of the new e-business paradigm successfully. Firms are utilizing the Internet and associated technologies to support their business activities, by internally applying Enterprise Resources Planning (ERP) which considered as very expensive, costly and complex and they are investing in this system at an alarming rate, even though there are high rates of ERP adoption failure among organizations worldwide. Very few studies have been conducted regarding technology acceptance of ERP systems at individual level (end users). Therefore, this study aims to examine Job Security (JS) as a Critical Successful Factor (CSF) that affects the individuals' acceptance of the ERP system in the Saudi Arabia Air-transportation Industry, by studying the impact of JS as factor on individual's behavioral intention to use (BIU) the adopted ERP system, and consequently, assist in avoiding adoption failure, eventually leading to firms fully realizing the advantages of ERP solutions. In this study, TAM theory is considered the most influential theory among the technology acceptance theories, and it is fundamental to understand that there is a comprehensive relationship between TAM and JS as CSF. Comprehensive data analysis was conducted, including Structure Equation Modeling (SEM), to verify the research outcome. The finding from this study has validated JS as CSF of ERP implementation; Based on the research finding, a reliable model (JS-TAM) was constructed, which explains how JS has influenced the end users' acceptance or "Behavioral Intention to Use" of ERP system. A comprehensive explanation of employee's behavioral intention to use of ERP system was obtained by testing the moderators' effect on the research model. Ultimately, it is assumed that this study will help researchers and organizations to construct a better comprehensive model that prevent of ERP system implementation failure.*

**Field of Research:** Enterprise Resource Planning; ERP implementation; Technology Acceptance Model; ICT in Saudi Arabia; Structural Equation Modeling.

## 1. Introduction

Researchers considered the ERP systems as integrated applications that satisfy the transaction-processing requirements for a wide range of business activities, including purchasing, production planning, warehouse management, inventory control, sales order processing, distribution, finance, and human resources (Carton, Sammon & Adam, 2008).

Others described the ERP system as a bundle of software applications centered on a single integrated database, mainly to support the business process adopted by the organization, and to balance the supply and demand for its resources. This software usually consists of multiple modules such as manufacturing, distribution, personnel, payroll, and finance, and is considered as providing the necessary infrastructure for e-commerce (Dunn, Gerard & Grabski, 2005).

Typically, the ERP system is a software package consisting of several modules, such as human resources, sales, finance, and production. These modules provide cross-organization integration throughout the embedded business processes in a single database. Organizations can customize this software package to meet their specific needs. The ERP system is designed to execute any transaction through any authorized users in any part of the firm, and provides business support for different divisions, departments, business units and functions, throughout the organization (Esteves & Pastor, 2005).

The ERP system is an integrated business solution that helps the organizations to attain their competitive goals. The ERP system enables organizations to integrate business functions into the unified and integrated business processes. Over the past decade, many large and SME's organizations have implemented ERP systems (Arnold, 2006).

Firms have spent millions of dollars on ERP projects; the incentive behind these very high investments is to improve organizational performance, effectiveness and efficiency. ERP primarily expects an increase in organizational performance, because the system is capable of capturing and distributing the information throughout the organization more quickly, which helps the individuals to make the right decisions on the right time and perform their jobs well (Alturki, Andijani & Siddiqui, 2011).

Many benefits and enhancements can be gained by the organization once the ERP system is fully realized; examples of these benefits are: reduced cycle time, faster information transactions, better inventory control, increased productivity, maintenance of dependable supply chain links, reduced transportation and logistics costs, setting a good basis for e-business and e-commerce, etc... (Calisir & Calisir, 2004).

## 2. Research Problem

ERP system was promoted as a way to "streamline" processes, with the insinuation that streamlining meant job cuts. Several studies conducted involving staff interview in a focus group, indicated that the employees felt their jobs were at risk. Other cases were more concerned with the way that company management communicated the benefits and the need for the ERP system to the other stakeholders (Livermore, 2005).

When an organization's legacy system is replaced with an ERP system, one of the immediate problems is the loss of confidence among the workers of their job security (Chan, 1999). A researcher has stated that dissatisfaction with the management's communication style and the worker's need to be provided with clear and comprehensive information about the project, especially about matters of serious concern, such as potential job losses (Oliver & Van Dyke, 2005).

One of the critical issues is setting up realistic expectations regarding employee's job security accompanying the changes to an organization during ERP implementation (Laakso, 2007). In another study, it was concluded that adopting ERP systems is correlated with negative attitudes, which appear to affect the behavioral intention to adopt an ERP system. One of the reasons is Business Process Reengineering (BPR), which improves processes and eliminates some non-value added activities, leading to personnel reduction in administrative and operational jobs. Companies adopting an ERP system could reduce staff costs since many business functions are automated and a significant amount of clerical work can be eliminated (Arunthari & Hasan, 2006).

In investigating employees' behavior towards the new adopted system, there is evidence that some individuals are inhibited from sharing knowledge and experiences, if they believe that their job security would be decreased (Jewels, Underwood & Ford, 2005). In another study, users worried about their job security, their position, authority, and the effect of the new system on their everyday work (Allen, Kern, & Havenhand, 2002). In some cases, organizational results were generally negative about ERP implementation due to job security concerns and reduced morale attributed to the many project challenges (Snider, da Silveira, & Balakrishnan, 2009).

Referring to a Questionnaire Survey conducted in China about 'Implementing ERP Systems', the degree of perceived job security and the existence of formal forms of employee representation also turned out to be important factors associated with the implementation process and the ERP project's outcome. One of the research finding is that the degree of job security turns out to be a strong predictor of project success (Reimers, 2001). Another result of a Chinese enterprise's survey, confirmed that human-related factors in ERP implementation, such as job security, were more important than system-related factors, in achieving success in the implementation process (Chan, 2007).

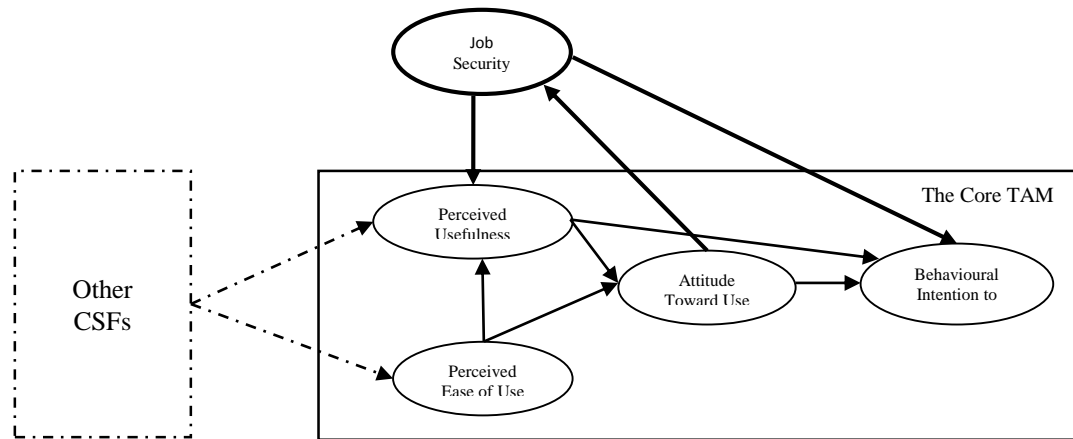
A study has argued that there are other factors that may be relevant to ERP system's implementation, such as attitude toward change, which needs further development and refining; other work-related factors, such as job satisfaction and job security can be considered for further investigation (Kwahk, 2006).

In reference to the previous arguments, this study aims to investigate Job Security (JS) as CSF that affects the employees' behavior Intention to use (BIU) the new adopted ERP system in Saudi Arabia Air-transportation Industry, helping firms to attain the full potential of the expensive system and reduce the possibility of the ERP implementation failures.

### 3. Methodology and Framework

Reviewing numerous theoretical perspectives has promoted the undertaking of ICT usage and adoption such as TRA, TPB, TAM and UTAUT. It is found that TAM has been extensively accepted as the core framework to comprehend the acceptance of the end users of ICT system. Without doubt, TAM has proven to be the optimum model that explains the discrepancy regarding the end users' behavior associated with ICT usage and adoption within a diversity of contexts (Hong, Thong & Tam, 2006).

The next paragraphs describes the construction of this study's theoretical model, which examines JS with core TAM, see Figure -1.



**Figure 1: Research Framework**

The current study investigates JS as CSF that affects the individuals' acceptance and use of the ERP system in the Air- transportation Industry in Saudi Arabia. Assuming that enhancing the employees' feeling for of their JS will directly affect their BIU of the adopted ERP system.

The basic TAM (Davis, was utilized as the core of the theoretical and methodological framework. It has one dependent variable BIU, and four independent variables: Perceived Usefulness (PU), Perceived Ease of Use (PEU), and Attitude Toward Use (ATU), in addition to JS as CSF.

One of the immediate problems with ERP implementation is the loss of confidence among the workers in their job security due to replacing the organization's legacy system with the new ERP system. The employees were dissatisfied with the management's communication style; there is a need to provide clear and comprehensive information about the project, especially about matters of serious concern, such as potential job losses (Chan, 1999 and Oliver & Van Dyke, 2005).

One of the critical issues is setting up realistic expectations regarding employee's JS accompanying the changes to an organization during ERP implementation (Laakso, 2007). Researchers have concluded that adopting ERP systems correlates with negative attitudes, which appear to affect the BI to adopt an ERP system (Arunthari & Hasan, 2006).

In this research, JS is considered as a CSF which has direct effects on the individuals' PU of the ERP system; it is also considered as a mediator variable that mediates the relation between ATU and the individuals' BIU of the ERP system.

There are more CSFs have been determined and validated by previous researchers (Bueno & Salmeron, 2008), which will be examined in this study and it might be included in a future research "shown as dashes in the research model Figure-1".

A survey was conducted to examine the effects of JS in relation to the individuals' PU, ATU and BIU of the ERP system. This survey investigated the cause and effects of the ERP system implementation on the individuals concerning their job function, expected benefits, rewards and fear of job loss due to system implementation.

In addition two proposed groups of moderators affect the relationships between the constructs of the proposed research model: First, moderators concerning the individuals' socioeconomic status, such as age, income and educational level. These moderators were selected, in particular, due to their potential impact on ICT users as recommended by the literature (Gefen, 2003) and (Guindon, Lavis, Bouphe, Guang, Sidibe & Turdaliyeva, 2010).

Secondly, moderators concerning the individuals' training and occupation status, such as position, nature of work and training received by employees. According to a research recommendation (Venkatesh, Morris, Davis & Davis, 2003), firms should establish training programs commensurate with employees' position, and nature of work, to help increase individuals' awareness of the IT system and minimize the fear of using new technology. Moreover, he suggested that organizations take into consideration the nature of work by improving the working conditions to enhance the usage and acceptance of employees of new technologies.

Based on the above arguments, thirteen hypotheses were drafted to be tested, as follows:

- H<sub>1</sub>: ATU has a direct positive effect on BIU of the ERP system.
- H<sub>2</sub>: JS mediates the relation between ATU and BIU of the ERP system.
- H<sub>3</sub>: JS has a direct positive effect on PU of the ERP system.
- H<sub>4</sub>: PU for ERP system has a direct positive effect on BIU.
- H<sub>5</sub>: PU for ERP system has a direct positive effect on ATU.
- H<sub>6</sub>: PEU of ERP system has a direct positive effect on ATU.
- H<sub>7</sub>: PEU for ERP system has a direct positive effect on PU.
- H<sub>8</sub>: Employee's age moderates the relationships between the latent variables within the research model.
- H<sub>9</sub>: Employee's income level moderates the relationships between the latent variables within the research model.
- H<sub>10</sub>: Employee's educational level moderates the relationships between the latent variables within the research model.
- H<sub>11</sub>: Employee's position moderates the relationships between the latent variables within the research model.
- H<sub>12</sub>: Employee's nature of work moderates the relationships between the latent variables within the research model.

- H<sub>13</sub>: Training received moderates the relationships between the latent variables within the research model.

A quantitative methodological approach was used, involving a survey by using a questionnaire of 26 questions extracted from previous researches. The questionnaire was tested for wording, layout, the questions' sequencing, reliability and validity (Singh, 2007).

#### 4. Participants and Procedures

Five steps processes were conducted for this study as follows:

- A data collection employing a snapshot of instances by surveying air transportation industry employees in Saudi Arabia randomly, where estimated population was 24,383 employees. Consequently the sample size was 378.
- Investigating the correlations between the research frameworks constructs at that instance.
- Utilizing AMOS software as a statistical tool to test the model fitness which explained the correlation between constructs and concluded with an empirical generalization of the phenomena.
- Conduct a statistical analysis to give an explanation based on dominant patterns that emerged from a broad view of the phenomenon in a variety of settings.
- Finally, report the conclusion of this study and the potential of future studies, limitations and recommendations.

##### 4.1 Data Collection

The internet was used as the data collection method in this study (Survey Monkey) and a bilingual questionnaire (English and Arabic), the survey was distributed to 2,000 employees of ten air transportation companies in Saudi Arabia that have implemented the ERP system. Stratified sampling technique was adopted; the outcome was 468 respondents' questionnaires were submitted to Survey Monkey's website.

The total response rate for this study was around 23%; 385 questionnaires were completed and usable; the other 83 questionnaires were either incomplete or unusable. Therefore, the adjusted response rate was around 20% as these 385 questionnaires were considered as the actual data used in the study.

##### 4.2 Data Analysis

Descriptive analysis and respondents' profile provided demographic information and described the population of the sample for the study, using descriptive statistics.

Data analysis was conducted using AMOS, SPSS packages and Microsoft Excel software. The objectives of this analysis were to examine the proposed model and test the related hypotheses. Two types of FA were used, EFA and CFA, in addition to SEM (Hair, Black, Babin, & Anderson, 2010):

- A. *EFA Firstly*, EFA consisted of five steps: data management, reliability and validity test, multicollinearity test, sampling adequacy test and PFA (Hair, Black, Babin, & Anderson, 2010).

The first step was data management, which included data cleaning, investigating multivariate outliers and normality test for the collected data. Data management started with data cleaning utilizing AMOS, it was found that there were no missing data in the collected data, and then investigating multivariate outliers - the results demonstrated that all 385 cases were valid for further analysis. This was accomplished by comparing the calculated maximum value for Mahalanobis distance ( $D^2$ ) = 257.93 with the value for Chi-square ( $\chi^2$ ; 22; 0.001) = 288.95. Since Mahalanobis distance ( $D^2$ ) of each case was less than the Chi-square ( $\chi^2$ ; 22; 0.001), it indicated that there were no outliers in the collected data (Tabachnick & Fidell, 2007).

The final test in data management was to investigate the collected data for data normality, using Z Skewness and Z Kurtosis; it was found that the collected data was considered as normally distributed. In fact, the majority of the collected data had Z value within skewed index and kurtosis index in reference to the threshold values, except for seven variables which had skewed index (Z Skewness >3) with kurtosis indexes within the normal range (Z Kurtosis < 7). Bearing in mind that Z kurtosis is of greater concern than Z Skewness, it indicated that these data can be considered as normally distributed (Hair, Black, Babin & Anderson, 2010); (Curran, West & Finch, 1996); (Coakes & Steed, 2003) and (Kline & Little, 2011).

The second step was the reliability and validity test, which included internal reliability, composite reliability, convergent validity and discriminant validity.

Cronbach's Alpha was used to determine the internal consistency reliability; three out of five constructs had excellent reliability, where Cronbach's Alpha value was greater than 0.91, while two had good reliability with value greater than 0.82. Furthermore, for all constructs, Cronbach's Alpha value was excellent of more than 0.9 (0.95, 26); therefore, the research measure was considered good and accurate (Table-1).

The CR was calculated for the main data; three out of five items had excellent reliability, where composite reliability value was greater than 0.9, while two had good reliability with value greater than 0.8.

Convergent validity required three tests; factor loading was more than 0.7 for each of the 26 observed items (variables), CR values was more than 0.8 and AVE test values exceeded 0.7. With reference to the threshold values of these tests, it was concluded that the instrument used to collect the main data had good convergent validity (Table-1).

Discriminant validity was determined by comparing the calculated AVE for each pair of constructs with its value of the square correlation. As a rule of thumb, the values of calculated AVE for all pairs must be less than the correlation square values of variables for these pairs (Fornell & Larcker, 1981); the results of the comparison showed that the pair of the model constructs was different from each other (Table-1).

**Table-1: Main Data Composite Reliability (CR) Internal Reliability (Cronbach's Alpha- all items =0.961)**

Observed variables	Standardised loading	(standardised loading) <sup>2</sup>	SMC	error	CR	AVE	Cronbach's Alpha
BUI 1	0.850	0.723	0.730	0.270			
BUI 2	0.890	0.792	0.800	0.200			
BUI 3	0.770	0.593	0.590	0.410			
BUI 4	0.730	0.533	0.530	0.470			
BUI	3.240	2.640	2.650	1.350	0.886	0.660	0.883
ATU 1	0.850	0.723	0.730	0.270			
ATU 2	0.830	0.689	0.690	0.310			
ATU 3	0.820	0.672	0.680	0.320			
ATU 4	0.860	0.740	0.740	0.260			
ATU 5	0.820	0.672	0.670	0.330			
ATU	4.180	3.496	3.510	1.490	0.921	0.699	0.920
PU 2	0.920	0.846	0.850	0.150			
PU 3	0.950	0.903	0.890	0.110			
PU 4	0.910	0.828	0.820	0.180			
PU 7	0.530	0.281	0.280	0.720			
PU	3.310	2.858	2.840	1.160	0.904	0.714	0.911
PEU 1	0.800	0.640	0.640	0.360			
PEU 2	0.850	0.723	0.720	0.280			
PEU 3	0.960	0.922	0.930	0.070			
PEU 4	0.810	0.656	0.660	0.340			
PEU	3.420	2.940	2.950	1.050	0.918	0.735	0.920
JS 3	0.790	0.624	0.620	0.380			
JS 4	0.970	0.941	0.950	0.050			
JS 5	0.790	0.624	0.630	0.370			
JS	2.550	2.189	2.200	0.800	0.890	0.730	0.821

The third step was to examine the correlation amongst the factors (multicollinearity) of all the variables used by the model in our study; all VIF values were less than 10 and the tolerance was more than 0.1 (Hair, Black, Babin, & Anderson, 2010). Consequently, multicollinearity did not exist among the variables in the current study.

The fourth step was to check the factorability by measuring sampling adequacy using KMO; it was found that the sufficiency of sampling adequacy was far more than 0.5 (threshold value) as the lowest value was 0.764 and highest value of 0.911 with the significance level of Bartlett's tests of sphericity equal to .000, which is less than 0.05. These results proved the factorability of the correlation matrix and continued satisfaction with FA (Table-2).

The fifth step was conducting EFA for each construct in the study using PFA, tested with varimax rotation utilizing SPSS package software. At least one factor in each construct in research model abstracted and explained 55.04% to 80.85% of the total variance; it had Eigenvalue ranged between 2.99 to 4.71, which is above 1.0 as the recommended value (Bryman & Cramer, 2011) and (Gaskin, 2011).



**Table-2: Measure of Sampling Adequacy KMO and Bartlett's Test**

Variables	KMO	Approx. Chi-Square	df	Sig.
BUI	.810	900.851	6	.000
ATU	.894	1381.789	10	.000
PU	.874	2293.216	21	.000
PEU	.839	1244.497	6	.000
JS	.788	1116.039	15	.000

- B. *CFA: Secondly, CFA was conducted on the collected data utilising AMOS, with the following indices examined to confirm the goodness-of-fit for each construct in the research model: factors loading, CMIN, GFI, CFI, RMSEA and PCLOSE.*

All constructs in the research model fitted well to the collected data; it indicated goodness-of-fit values within the recommended threshold values (with cretin modification), which some constructs requiring a convergence between the covariance or deleting an indicator.

- C. *SEM: Thirdly, SEM analysis was conducted to determine the goodness-of-fit for the proposed research model. SEM parametric analysis was used to consolidate the hypotheses under investigation.*

The SEM results of the research model have demonstrated fit indices for the measurement within their threshold values, as follows: CMIN/DF = 1.88, GFI = 0.97, CFI = 0.99, RMESA = 0.05 and PCLOSE = 0.56; moreover, additional results were reported such as TLI= 0.99, NFI= 0.98, IFI= 0.99, RFI= 0.97. Therefore, the goodness-of-fit indices obtained during this study suggested that the research model fitted the data quite well (Table-3) (Figure-2).

**Table 3: The Fit Measures' Values of the Research Model**

Measures	Research value	Threshold values
Chi-square ( $X^2$ )	77.13	P < 0.05 indicates an acceptable fit.
P-Value	0.00	A value < 0.05
CMIN/DF ( $X^2 / df$ )	1.88	A value < 3 indicates a good fit A value < 1 indicates over fit model.
CFI	0.99	A value > 0.9 indicates a very good fit.
RFI	0.97	A value > 0.9 indicates a very good fit
IFI	0.99	A value close to 1 indicates a very good fit
TLI	0.99	Close to one indicates a very good fit Greater than one indicates over fit model
NFI	0.98	0 < value < 1 indicates fit model.
GFI	0.99	A value > 0.9 indicates a very good fit.
RAMSEA	0.05	A value < 0.05 indicates fit of the model.
PCLOSE	0.56	A value > 0.5 indicates a very good fit.

### 4.3 Results

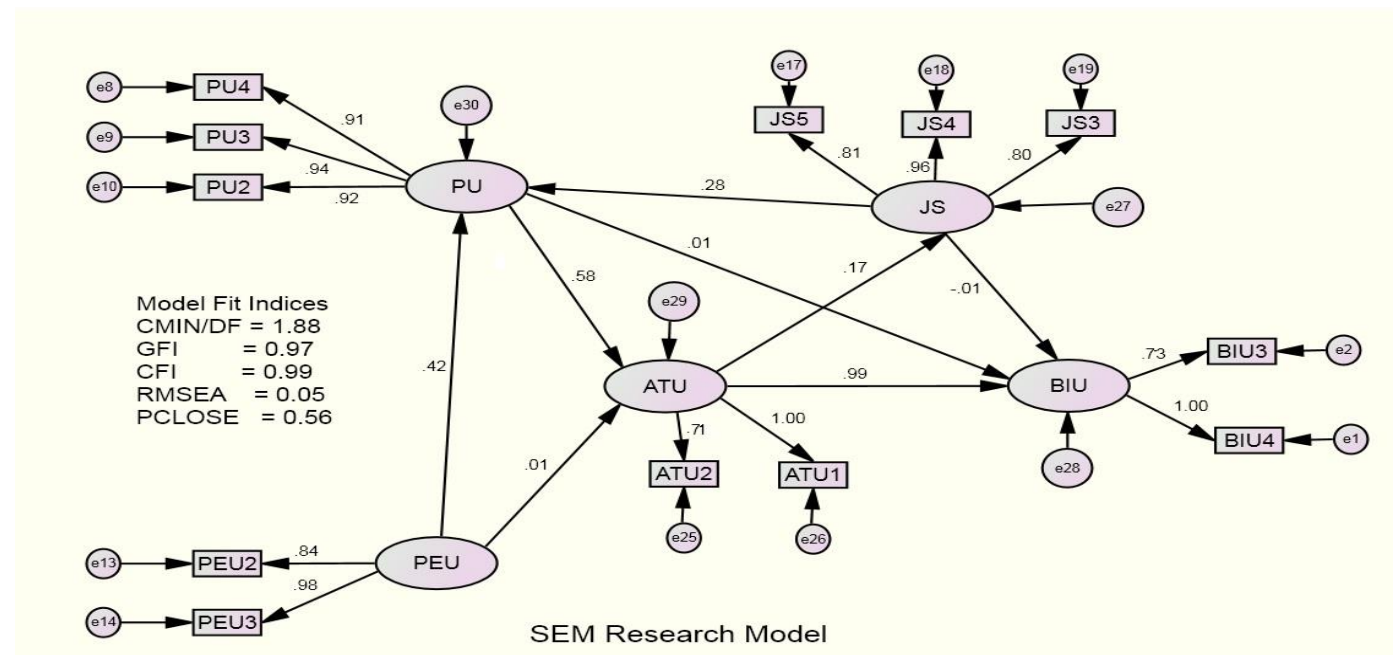
The evaluation of the research findings have presented by the interpretation of the results of data analysis in the context of the 13 research hypotheses and the theoretical framework discussed

previously. In addition, it included several assessments of the findings, such as research hypotheses testing, moderator's effect evaluation and alternative model comparison.

By conducting the SEM analysis, eight relationships were established among the research constructs; by examining these results, it was found that five were significant relationships and three were non-significant relationships.

**Table-4: Summary of the Hypothesis Testing Results**

Hypo	Hypothesized Path	Estimate	S.E.	C.R.	P	Hypo Tested
H1	ATU → BIU	.99	.01	78.07	***	Supported
H2	ATU → JS → BIU	.18	.06	2.78	***	Supported
		-.01	.01	-1.00	.32	
H3	PU → BIU	.01	.01	.74	.46	Not Supported
H4	PU → ATU	.58	.05	10.90	***	Supported
H5	PEU → ATU	.01	.04	.27	.79	Not Supported
H6	PEU → PU	.29	.04	7.68	***	Supported
H7	JS → PU	.27	.05	5.08	***	Supported



**Figure 2: SEM: JS-TAM Research Model**

The other six hypotheses, concerning the moderators' effect on the hypothesized model; such as age, income level, education level, employees' position, employees' work nature and training received, were supported (Table-5).

The last step in the model's assessment approach was completed for series of models, which are considered as an alternative model that can give better explanation than the initial model, and then comparing those equivalent models with the proposed hypothesized model.

The final hypothesized model with a good fitness indication was re-estimated by deleting all the non-significant paths, including PU → BIU, JS → BIU, and PEU → ATU, to generate an equivalent model.

The goodness-of-fit for the alternative model indicated better results than the hypothesized model, and the measurements were as follows:

**Table-5: Summary of the Hypothesis Testing Results (Moderators)**

Hypo	Hypothesized Path	Group Number 1		Group Number 2		z-score	Hypo Tested
		Estimate	P	Estimate	P		
<b>Employees' Age as Moderator</b>							
H8	PEU → PU	0.220	0.000	0.370	0.000	1.97**	Supported
	JS → PU	0.430	0.000	0.110	0.100	-3 ***	Supported
<b>Employees' Income Level as Moderator</b>							
H9	JS → PU	-0.52	0.03	0.14	0.23	2.43**	Supported
	ATU → JS	0.94	0.00	0.16	0.19	-3.12***	Supported
<b>Employees Education Level as Moderator</b>							
H10	JS → PU	0.390	0.000	0.160	0.030	-2.3**	Supported
<b>Employees' Position as Moderator</b>							
H11	PEU → ATU	0.060	0.150	-0.150	0.020	-2.7***	Supported
	PU → ATU	0.450	0.000	0.870	0.000	3.7***	Supported
<b>Employees' Work Nature as Moderator</b>							
H12	PEU → ATU	0.150	0.050	-0.120	0.060	-2.7***	Supported
	PU → ATU	0.190	0.060	0.790	0.000	4.23***	Supported
<b>Employees' Received Training as Moderator</b>							
H13	ATU → BIU	1.14	0.00	0.78	0.00	-2.03**	Supported
	PU → BIU	-0.25	0.00	-0.02	0.82	1.83*	Supported
	PU → ATU	0.50	0.00	0.74	0.00	2.34**	Supported
	JS → PU	0.23	0.06	0.72	0.00	2.26**	Supported
<b>Notes:</b> *** p-value < 0.01; ** p-value < 0.05; * p-value < 0.10							

CMIN/DF = 1.78, GFI = 0.97, CFI = 0.99, RMSEA = 0.05, PCLOSE = 0.67. Moreover, additional results were reported such as TLI= 0.99, NFI= 0.98, IFI= 0.99, RFI= 0.98. To confirm the above arguments, a calculation for a significance level of specified  $\Delta\chi^2$  values in  $\Delta df$  value was undertaken, which proved the differences between the models are significant (Hair, Black, Babin, & Anderson, 2010) and (Gaskin, 2011).

The significance level of the differences between hypothesized and alternative model was 0.736, which indicated that there was no significant differences between hypothesized and alternative models (Table-6).

**Table 6: Comparing the Hypothesized and Alternative Model GOF Measures**

GOF Test	Hypothesized Model	Alternative Model
Discrepancy ( $\chi^2$ )	77.13	78.40
Degree of freedom (df)	41	44
p-value	0.00	0.00
Model Parameters	37	34
Discrepancy /df (CMIN)	1.88	1.78
RMR	0.09	0.09
GFI	0.97	0.97
CFI	0.99	0.99
IFI	0.99	0.99
RMSEA	0.05	0.05
PCLOSE	0.56	0.67

## 5. Conclusions and Recommendation

This section is divided into five parts: A) provides a summary of the research finding; B) demonstrates the significance of the research, including theoretical, methodological and practical implications; and C) outlines research limitations; D) suggested future research, and E) The conclusions.

### 5.1 The Research Finding

The current study evaluated and analyzed JS as a CSF that influence the acceptance of ERP system by employees in the Saudi Arabia air transportation industry, helping organizations to minimize the risk of failures and obtain full potential of the costly ERP system. Based on the statistical test results and the evaluation of the research hypotheses, the following sub-section addressing the research problem:

The current research model constructed and confirmed evidence about JS as key factor in ERP system acceptance, which helped to set the individuals' behavior toward the ERP system usage.

The current research contributed confirmation about the ERP system's acceptance by integrating JS as a CSF and TAM. In particular, the outcome of the current study validated that JS affected the individual's intention to use the ERP system in the air transportation industry in Saudi Arabia.

This study responded to the call from (Reimers, 2001); (Chan, 2007) and (Kwahk, 2006), who urged researchers to investigate JS as a CSF that may affect ERP system implementation. In this study, the results showed that JS is considered as critical factor that is strongly affected the individuals' Perceived Usefulness, which directly affects the ATU that formulated the individual's BIU the ERP system.

These results harmonized with TAM theory, which states that PEU and PU can predict the behavior of actual system usage by direct or indirect evaluation of the mediating variables of ATU and BIU the new system (Davis, 1989).

Despite the enormous investments by firms in the ERP system, there have been many implementation failures, and there is a consensus that many organizations have not been able to realize the full potential of the values brought by adopting the ERP system. Consequently, many studies have revealed a range of CSFs that can aid in avoiding ERP implementation failure. Therefore, recognizing those CSFs will allow

the firms to realize the ultimate advantages of the ERP system (Ngai, Law & Wat, 2008) and (Supramaniam & Kuppusamy, 2011).

Moreover, end users' lack of enthusiasm or disinclination to adopt or use the newly implemented ERP system is one of the commonly cited causes for ERP failures [36]. According to TAM theory by Davis (Davis, 1989), the PEU and PU can predict the behavior of actual system usage by direct or indirect evaluation of the mediating variables of ATU and BIU of the new system.

Based on the previous statements, the current study constructed a model to evaluate JS as one of the CSFs of ERP implementation utilizing TAM theory, which provides answers to the research problem as demonstrated below:

Linear relationships have existed among the constructs in the research model; therefore, based on the research hypothesis testing and process was established to investigate the relations between the constructs of the research model. Starting out from the end of the model, the process tracked the linear relationships of each of the independent variables (JS, PU, PEU and ATU) with BIU, as the research dependent' variable.

Based on the above process and reference to the research model (Figure-1), the following paragraph demonstrates how JS has influenced the end users' acceptance of the ERP system:

JS is considered as CSF that has direct effects on the PU received by individuals who use the ERP system. Therefore, enhancing JS feeling among employees who feel not secure in their jobs, consequently, will enhances their PU of the ERP system.

Although PEU has no direct effects on individuals' ATU, but individuals' PEU has shown strong effects on enhancing the PU of the ERP system.

Finally, reaching to the end of the model, the results showed that PU of the ERP system strongly affects the individuals' ATU the new system; consequently, ATU the new system strongly influences their BIU the implemented ERP system.

Additionally, the PU of the new system has direct negative effects on individuals' BIU the ERP system. JS partially mediate the relation between the individuals' ATU the new system and their BIU the implemented ERP system.

The current study has tested the moderating effects of three socioeconomic statuses (age, income and educational level) on the hypothesized research model, seeking a comprehensive explanation for the employees' BIU the ERP system. SEM was used to examine the moderating effects.

*A. Addressing Employees' Age as Moderator:*

*The evaluation of employees' age as moderator; comparing the younger group "Age group number 1", which consisted of employees who are under 40 years old with the older group "Age group number 2", which consisted of employees who are above 40 years old. Empirical evidence showed there is a*

*difference between the younger group and older group, especially on the following structural path (PEU → PU) (JS → PU).*

The statistical results indicated that the PEU is enhanced the PU of the ERP system in the younger group more than the older group; on the other hand, older group felt less secure in their jobs, which degraded the individual PU of the ERP system.

*B. Addressing Employees' Income Level as Moderator:*

The evaluation of employees' income level as moderator; comparing the lower-paid group "Income group number 1" (the employees who received salary less than 13,000 Saudi Riyals) with the higher-paid group "Income group number 2" (the employees who received salary more than 13,000 Saudi Riyals).

Empirical evidence showed that there is a different between the lower-paid group and the higher-paid group, especially on the following structural path (ATU → JS) and (JS → PU).

For instance, the statistical results indicated that with the higher-paid group, their positive ATU the ERP system strongly promoted their feeling of JS, but there is no significant relationship in the lower-paid group. On the other hand, in the lower-paid group feels less secure in their job (JS) which has affected their PU of the ERP system while there is no significant relationship in the higher-paid group.

*C. Addressing Employees' Education Level as Moderator:*

The evaluation of employees' education level as moderator, comparing the non-degree holder group "Education level group number 1" (employees who hold high school diplomas) with the degree holder group "Education level group number 2" (employees who hold a bachelor's or master's degree).

The statistical result has shown that for the degree holder group feels more secure in their jobs which have enhanced their PU of the ERP system; while the non-degree holder group feels not secure, therefore, reduced their PU of the ERP system.

Furthermore, this study has tested the moderating effects of three individuals' occupation status (position, nature of work and training received) on the hypothesized research model, seeking a comprehensive explanation for the employees' BIU the ERP system. A multi-group SEM was used to examine the moderating effects of position, nature of work and training received on the final research model.

*D. Addressing Employees' Position as Moderator:*

The evaluation of employees' position as moderator; comparing the subordinate group "Employees Position group number 1" (employees such as clerks, administrators, technicians, operators, agents) with the superior group "Employees Position group number 2" (employees such as supervisors, managers, section managers, general managers).

Empirical evidence showed that there is a difference between the subordinate group and the superior group, especially on the following structural path (PEU → ATU) and (PU → ATU).

For instance, the statistical result showed that in the subordinate group PEU has negatively affected their ATU of the ERP system, while there is no significant relationship in the superior group; similarly, the PU of the subordinate group, has enhanced dramatically the ATU, but there was no significant relationship in the superior group.

*E. Addressing Employees' Work Nature as Moderator: The evaluation of employees' work nature as moderator:*

Comparing the technical group "Employees Work Nature group number 1" (employees using technical skills in their daily tasks) with the administrative group "Employees Work Nature group number 2" (employees working in the offices with administrative duties only).

Empirical evidence showed that there are differences between the technical group and the administrative group, especially on the following structural path: (PEU → ATU) and (PU → ATU).

For instance, the statistical results indicated that the administrative group's PEU has positively affected their ATU the ERP system, but there is no significant relationship in the technical group; furthermore, with the technical group, PU has dramatically enhanced the ATU but there is no significant relationship in the administrative group.

*F. Addressing Employees Who Received Training as Moderator: The evaluation of employees who received training as moderator:*

Comparing no training received group "Received Training group number 1" (employees who did not receive any type of training) with the trained group "Received Training group number 2" (employees who received any type of training).

Empirical evidence showed that there is a difference between no training received group and the trained group, especially on the following structural path (ATU → BIU), (PU → BIU), (PU → ATU), (JS → PU).

For instance, the statistical result showed that the trained group's ATU has strongly enhanced their BIU the ERP system more than the no training received group.

Furthermore, with no training received group, PU has enhanced negatively their BIU the ERP system but there is no significant relationship in the trained group. However, in the trained group, PU has enhanced their ATU the ERP system more than the no training received group; similarly, with the trained group, JS has a strong influence on the PU of the ERP system more than the no training received group.

## 5.2 Research Implications

The main propose of the current study is examine JS as a CSF that affect the ERP system implementation in Saudi Arabia air transportation industry. This was accomplished by analyzing the employees' BIU the adopted ERP system in relation with their feeling of JS, which in turn determined the individual's acceptance or rejection of the new system.

The next section elaborates on the theoretical and practical implications of the research.

#### *A. Theoretical Implications*

In the context of the TAM, this research has successfully extended TAM model [19] to a JS-TAM model, which uses TAM as core theory and has integrated JS as one of the CSF in the ERP system implementation.

The JS-TAM acceptance model was constructed and tested utilizing SEM. The model presents an explanation about the relationships between the model constructs and the employees' BIU the ERP system. It proposes that JS significantly affect the employees' PU of the adopted system, which enhances the employees' ATU it and consequently affects the employees' BIU the ERP system.

In contrast to TAM model which stated that the PU of the adopted ERP system enhanced the ATU and the BIU. The current research proves that without the guaranteeing of employees' JS, the above sequence of events will not be effective and the effort will be wasted as JS strongly influences the individuals' PU and drive the individuals' ATU and affects his BIU of the adopted ERP system.

Another important theoretical implication is throwing light on factors specific to the culture in developing countries, such as Saudi Arabia. Firstly, this study evaluated the effects of the individuals' socioeconomic status (age, income and educational level). The finding indicated that there are effects of the following groups on relationships in the JS-TAM model: younger age employees and the older age employees; high-income level and low-income level employees; no degree holder and degree holder employees for educational level.

Secondly, it evaluated the effects of individuals' occupation status (position, nature of work and training received) for employees in Saudi Arabia to explain the cultural drivers that might strengthen the resistance to change to the adopted ERP system. For instance, the position of the employees as subordinates or superiors had different effects on the relationships in the JS-TAM model; similarly, the employees' nature of work as technical or managerial staff had different effects on the relationships in the JS-TAM model. Finally, similar effect was shown for the relationships in the JS-TAM model as a result of employees' training status as 'group received training' and 'group did not receive any training'.

#### *B. Practical Implications*

One of the main research objectives supported by the findings of the current research is building a reliable model that can explain the effects of JS as CSF that influence the employees' acceptance or rejection of the ERP system. Therefore, JS-TAM model can be used by organizations to minimize the risk of failures and help them to obtain full potential of the costly adopted ERP system.

For instance, to enhance the JS feeling among the employees, the organization must affirm the individuals' material and moral benefits in adopting the new ERP system, explaining how they will experience more self-fulfillment in their job, with increased feelings of accomplishment, especially if it is combined with change in their job descriptions because of ERP system implementation.

Another practical implementation of this study is it might help organizations in some other nations having the same characteristics, industry type or culture with similar context and variables, which have implemented the ERP system in their organizations.



The findings from this study could assist both organizations and ERP vendors in achieving a faster rate of diffusion for the ERP system (Conrad, 2010). For instance, identifying one of the CSFs of ERP system implementation that affects the individuals' behavioral intention will help organizations to have a smooth system rollout and successful implementation.

Another practical implementation of this study is that organizations can obtain a comprehensive understanding for the employees' BIU the ERP system by testing the moderators' effect on the research model using multiple group analysis. These moderators are individuals' socioeconomic status (age, income level and educational level) and individuals' occupation status (position, nature of work and training received).

For instance, with regards to the employees' age, organizations have to set a simplified procedure to be used by the older employees as this will enhance their PU of the ERP system and also consider giving them special training programs. In addition, management needs to guarantee the jobs of older employees so that they feel more secure, which can upgrade the PU of the ERP system.

Concerning the employees' income level in the organizations, they have to structure an easy-to-use procedure for the lower-paid employees and give them special training as this will enhance their PU of the ERP system. In addition, management needs to promote the feeling of JS for lower-paid employees to maintain their positive ATU the ERP system. Finally, organizations need to guarantee the jobs of the higher-paid employees, as they feared losing their jobs (as a way of reducing the operational cost and streamlining the organizations' workforce) which degraded their PU of the ERP system.

Regarding the effects of employees' education level, in general, organizations need to give more attention to the ERP training programs for the non-degree holder employees, as they feel less secure in their jobs which degraded their PU of the ERP system.

Concerning the employees' position, for subordinate employees in the organizations, the management need to enhance their PEU, while for the superior employees, they need to enhance their PU, to achieve a positive ATU of the ERP system.

Concerning the employees' work nature, for administrative employees, organizations must enhance their PEU of the ERP system, which promote their ATU the ERP system. Moreover, for technical employees, because of their work nature, organizations tend to neglect their involvement in such projects, which is not appropriate in an integrated system like ERP. Therefore, special attention has to be given for technical employees to enhance their PU of the ERP system.

Training is a very important issue in implementing any new system. According to this study's finding, the PU of the ERP system have been influenced in the group that received training more than the group did not received training.

### 5.3 *Limitations of the Study*

The current research has obtained insightful results from the large sample size of employees in the Air transportation Industry in Saudi Arabia; the constructed model was based on reliable theory and comprehensive literature review. However, this study has some limitations.

One of the limitations is the inability to conduct the study on all industries that have implemented the ERP system in Saudi Arabia, because it was determined not to conduct the current study in industries that had only recently implemented the ERP system. Unfortunately, this condition only applied to the air transportation industry in Saudi Arabia.

This study is the first research that has evaluated the individual's acceptance of ERP system among employees in Saudi Arabia. Many other studies were exploratory in nature. Therefore, there is a need to reconfirm the results of this study by other studies using JS and the other critical factors that influence employee intention to use ERP system with different research setting. Indeed, confirming the current research results will help to develop a future research model that is considered reliable to explain the individual's acceptance of the ERP system.

Previous studies regarding individuals' behavioral acceptance of new technology has considered gender differences as an important moderator. This study examined the effect of six moderators on the hypothesized model evaluating the relationships between the JS as CSF construct and individuals' BIU the ERP system. However, due to the cultural nature, the research sample included males only, therefore, gender differences were not examined in this study.

#### **5.4 Future Research Propositions**

With reference to results from this research, several future researches are proposed to obtain a successful implementation of the ERP system as new adopted technology. First, the research model was tested on the employees of the air transportation industry in Saudi Arabia; a future study may be conducted with the same research setting in a different industry or sector.

Second, conduct a study using JS with the other CSFs to examine their influence on the individual's behavior intention in usage and adapting of the ERP system.

In this study, six moderators tested the relationships within the research model, but because of the nature of the research society's culture, gender differences were not examined during this study. Therefore, future research may consider testing gender differences as an important moderator affecting the individuals' behavior acceptance of new technology.

#### **5.5 Conclusions**

This study's findings have answered the research questions and fulfilled the objective, i.e., to determine the JS as CSF of ERP implementation that affected the individual's acceptance of the ERP system, with the aim of helping organizations to obtain full positional of the adopted costly new system.

JS as one of the CSFs in ERP implementation was validated, and it has affected the individual's intention to use the ERP system in the air transportation industry in Saudi Arabia.

In addition to JS, other factors have evaluated, such as the individuals' socioeconomic status (age, income and educational level) and individuals' occupation status (position, nature of work and training received) for employees in Saudi Arabia to explain the cultural drivers that might strengthen the resistance of change among the employees toward the adopted ERP system.

The previous discussion has provided an implications, limitations and suggestions for future research, all of which can help future researchers in this area to achieve more insight into the CSFs for successful implementation of ERP systems.

Finally, this research has achieved the targeted objectives, and a reliable model was constructed successfully. Ultimately, it is believed that JS is a very essential CSF and it is assumed that this study will help researchers to construct a better comprehensive model that prevent of ERP system implementation failure.

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