

# An Empirical Analysis Of Factors Affecting The Adoption Of E-Payment System From Firm's Perspective In UAE

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## Abstract

Due to exponential use of e-commerce by consumers', firms now days are forced to adopt Electronic Payment System to ensure consistency in the performance. The present paper examines factors that influence firms to adopt EPS. Factor analysis discovers that user friendliness is the most important determinant in adopting EPS by firms, followed by compatibility, data processing and trust worthiness. Cost of transaction being the most vital measure of user friendliness. Banks should pay attention to reduce cost of transaction and modernized procedures to make it more compatible with the needs of firms. Though trust and securities were rated as the least important factor in adopting EPS but transaction security cannot be compromised. Banks providing EPS should mind the fact that firms' trustworthiness can increase loyalty and reliability in the EPS system.

## 1. Introduction

Emergence of e-commerce has changed business perspective of the organization. E-payment become the integral part of ecommerce and has completely changed the way the organizations are conducting their businesses. It gives new shape to e-Commerce. Shon and Swatman [1] defined the electronic payment system (EPS) as transfer of funds using electronic communication channel. Innovative methods of EPS like smart card, credit card, electronic cash, electronic cheque and payment solutions such as PayPal, gives new opportunities to consumers and organizations to do the business globally in digital world. Security is always an important point of concern for the customer in case of online payment system. Researchers like Odom, Kumar and Saunders [2] also studied the factor that stops the customer from using online payment system and trust is considered as one of the important factors of consideration, but customer still prefers to use online payment as it is easy and time consuming and more flexible as compared to traditional methods of payment. [3] [4] [5]. This shows the significance of EPS to ecommerce transactions in

today's world. Even this revolution has spawned to the organizations also. All the organizations whether it is small scale or large scale, from grocer to big banks all are extending their business online and provide their services online. For them also it becomes vital to adopt modern system of payment so as to attract more customers. Providing security, privacy, trust and flexibility to their customers is equally important for them.

The factors affecting the adoption of EPS from firms point of view has been the subject of much debate. Installing EPS for business transaction does not provide competitive edge to business. In fact it depends on the actual utilization and usage of those services. While most previous research regarding the firm's adoption of EPS has been carried out in the technologically developed world, little is known about its acceptance in the Arab region. In fact, most of the research studies the factors that affect the adoption of EPS from customer's perspective. The current study is an attempt to explore the factors that motivates the organizations to use the EPS.

## 2. Review of Literature

There are many studies being done on factors affecting adoption of e-payment system. However, there are very few studies undertaken to find, what prompts companies to adopt e- payment systems.

Harris, Krishnan Guru and Avvari [6], studied that flexibility, functionality, data management, privacy and security are some of the important factors that firms look out before adopting e- payment systems. Harris et al. [7] focused on electronic case, electronic cheques, smart cards and credit cards for finding out Malaysian firm's perception towards use of EPS. Internet payment system is defined as any prevailing or new payment system that enables financial transactions to be conducted safely from one organization or individual to another via the Internet. In her study [8], she focused on technological as well as study other factors also e.g. security, acceptability, convenience, cost, anonymity, control, and traceability and evaluate the difference of each electronic payment system by studying their

requirements, characteristics and assess the applicability of each system.

Changsu Kim, Wang Tao Namchul Shin and Ki-Soo Kim [9], examined the issues of security in EPS from consumers' perception in Korea. Changsu Kim et al [9] used Structural Equation Modeling to determine the significance of perceived trust and security for use of EPS.

The present paper aims to examine firm's perception regarding the adoption of e-Payment system. The studies looked at the basic factors such as functionality, user friendliness, data processing and trust worthiness, affecting the adoption of e-Payment system and help the organizations to determine the different capacities they need to develop for providing customer-focused services in the area of e-Payment system.

## 2.1 Discussion about factors affecting choice of EPS

### 2.1.1 User Friendliness related factors

According to Davis [10], user ease is the efforts person has to put in for using any system. Harris et al [6], considered cost, duration of transaction, ease of use as the most important measure of user friendliness.

### 2.1.2 Compatibility

Compatibility is the degree to which an EPS is as consistent with the existing values, past experiences, and needs of users [11]. So when firms are able to trace their E-payment transaction, transferability of balance from one device to another and ability of the system to reload the balance are counted as measures for compatibility.

### 2.1.3 Data Processing

As discussed by [6] ability of system to provide multiple bank system, ability of EPS to analyze various payments and ease of organizing all customers' payment are integrated in data processing.

### 2.1.4 Trust Worthiness

Hanudin mentioned that privacy and security are two important measure of credibility. [12] For the purpose of research, trust worthiness is defined as ability to rely on EPS, ability to protect firms' information and secure details of firms' transaction.

## 3. Research Methodology

### 3.1 Instrument Design

The structured questionnaire was designed and used in order to conduct current study. The questions were structured and used a 5-point Likert scale because it is extremely popular for measuring attitudes and the method is simple to administer. In this study, Respondents generally choose from five alternatives and number from 1 to 5. This scale ranges from strongly disagree 5, disagree = 4, average= 3, agree = 2 and strongly agree = 1. The respondents are required to answer 36 questions which comprise of demographic like age, education etc and other questions which are helpful to understand the perception of adoption of e payment services by organizations.

### 3.2 Pretest and Pilot Study

For checking the reliability of instrument, the researchers have taken 100 respondents from different organizations. Questionnaires were distributed to those respondents to check the reliability of the instruments. Cronbach's coefficient alpha test is used to check the reliability of the instrument using SPSS 19.0. The test shows that the value of Cronbach alpha for the current pilot study is .959 which indicates a strong internal consistency among the variables. A Cronbach alpha coefficient of 0.7 and higher is adequate and signifies high reliability [7] [13]. Therefore, the variables used were concluded as reliable.

### 3.3 Sample

For the selection of organizations, researchers have taken the list of top 50 companies in UAE from website

<http://english.forbesmiddleeast.com/view.php?list=19>.

But from these 50 companies, government organizations are also there. Researcher was not allowed to conduct this survey there. Researcher contacted those organizations through email to contact further. These questionnaires will be distributed to different users working at different levels in those organizations in UAE. For current study, 95 per cent confidence, i.e. answers from the sample are 95 per cent close to the reality, was taken. 600 questionnaires were distributed to those organizations in UAE. Out of these, only 180 questionnaires were returned and only 160 were complete and useful for study. This means that there is a moderate response rate of 30%.

## 4. Descriptive Analysis

The descriptive statistics of the respondents are presented in Table 1. The results shows that mean responses lies between 1.14 and 2.68. Which shows that the most of the responses are agree and strongly agree. The table further shows that the more than half

of the observations are within one standard deviation of the mean which indicates that the data is distributed normally. Normality tests further requires the analysis of skewness and kurtosis values. Researchers will use the criteria that the skewness and kurtosis of the distribution both fall between -1.0 and +1.0 (Hair et al.1998). Values presented in Table1 are considered to be acceptable based on the above stated normality assumption.

**Table 1: Descriptive Statistics of Respondents**

	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Q1.	1.49	.824	.776	.169	.720	.337
Q2	1.59	.930	.602	.169	.027	.337
Q3	2.68	1.073	-.003	.169	-.814	.337
Q4	2.01	1.073	.853	.169	.024	.337
Q5	1.51	.847	.512	.169	.191	.337
Q6	1.22	.565	.605	.169	.112	.337
Q7	1.41	.800	.292	.169	.307	.337
Q8	2.09	1.129	.625	.169	-.875	.337
Q9	1.66	.956	.195	.169	.306	.337
Q10	1.36	.695	.098	.169	.076	.337
Q11.	1.48	.756	.471	.169	.321	.337
Q12	1.71	.861	.151	.169	.901	.337
Q13	2.03	1.121	.852	.169	-.054	.337
Q14	1.33	.645	.979	.169	.311	.337
Q15	1.23	.516	.184	.169	.922	.337
Q16	1.30	.695	.676	.169	.014	.337
Q17	1.31	.678	.449	.169	.479	.337
Q18	1.33	.683	.424	.169	.591	.337
Q19	2.03	.947	.452	.169	-.850	.337
Q20	1.32	.642	.370	.169	.734	.337
Q21	1.58	.961	.624	.169	.855	.337
Q22	1.25	.657	.001	.169	.530	.337
Q23	1.14	.428	.074	.169	.037	.337
Q24	1.89	.960	.748	.169	-.377	.337

Q25	1.39	.694	.758	.169	.441	.337
Q26	1.25	.568	.537	.169	.596	.337
Q27	1.91	.983	.897	.169	.176	.337
Q28	1.24	.563	.461	.169	.550	.337
Q29	1.23	.567	.042	.169	.464	.337
Q30.	1.27	.585	.234	.169	.380	.337
Q31	1.12	.901	.098	.169	.789	.337
Q32	1.25	.950	.065	.169	.067	.337
Q33	1.87	.789	.089	.169	.098	.337
Q34	1.61	.896	.908	.169	.785	.337
Q35	1.62	.675	.567	.169	.564	.337
Q36	1.09	.909	.467	.169	.453	.337

## 5. Findings

### 5.1 Exploratory Factor Analysis

Exploratory factor analysis is done using SPSS 19.0 on the initial 36 items The Kaiser-Meyer-Olkin measure of sampling adequacy test that is .930 for current study testifies that the data is appropriate for the factor analysis. Table 2 shows the result of KMO Barlett test

**Table 2 KMO and Bartlett's Test**

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.930
Bartlett's Test of Sphericity	Approx. Chi-Square	4788.446
	Df	630
	Sig.	.000

Principal component factor analysis is a statistical technique which is used to get more meaningful data which is not correlated to each other. An orthogonal varimax rotation was conducted because it maximizes the amount of variance described by a factor and minimizes the correlation between factors [13]. Principal component analysis requires that the probability associated with the Bartlett's Test of Sphericity be less than the level of significance which is 0.001 and hence it satisfies this requirement. Principal component factor analysis retains all the

items. According to rule, the items with communalities greater than 0.50 should be retained for further analysis. Table 3 shows that all the items have communalities greater than 0.50.

**Table 3 Communalities**

	Initial	Extraction
Q1	1.000	.662
Q2	1.000	.741
Q3	1.000	.684
Q4	1.000	.653
Q5	1.000	.641
Q6	1.000	.725
Q7	1.000	.646
Q8	1.000	.616
Q9	1.000	.598
Q10	1.000	.687
Q11	1.000	.656
Q12	1.000	.669
Q13	1.000	.676
Q14	1.000	.493
Q15	1.000	.671
Q16	1.000	.570
Q17	1.000	.625
Q18	1.000	.702
Q19	1.000	.670
Q20	1.000	.698
Q21	1.000	.677
Q22	1.000	.655
Q23	1.000	.606
Q24	1.000	.726
Q25	1.000	.587
Q26	1.000	.775
Q27	1.000	.582
Q28	1.000	.802
Q29	1.000	.704
Q30	1.000	.532
Q31	1.000	.624
Q32	1.000	.746
Q33	1.000	.653
Q34	1.000	.657
Q35	1.000	.678
Q36	1.000	.722

Extraction Method: Principal Component Analysis.

The next step is to check the anti-image chart where all the diagonal values should be greater than 0.05. All the items also fulfilled this criterion and hence retained. Visual inspection of anti-image matrix shows that the diagonal values were all greater than .50. The correlation matrixes where several sizable inter-item correlation were found, i.e. significant correlation, an indication that also supports factorability. These 36 items were further studied using factor analysis. Finally seven components are extracted which explained 66.138 per cent of the total variance as depicted in table 4. In addition, the cumulative proportion of the variance criteria can be met with seven components to satisfy the criterion of explaining 60 per cent or more of the total variance.

**Table 4 Total Variance Explained**

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	15.400	42.778	42.778	15.400	42.778	42.778
2	1.901	5.280	48.059	1.901	5.280	48.059
3	1.743	4.842	52.900	1.743	4.842	52.900
4	1.372	3.811	56.712	1.372	3.811	56.712
5	1.284	3.567	60.279	1.284	3.567	60.279
6	1.100	3.057	63.336	1.100	3.057	63.336
7	1.009	2.802	66.138	1.009	2.802	66.138

Extraction Method: Principal Component Analysis.

**Table 5 Rotated Component Matrix(a)**

	Component						
	1	2	3	4	5	6	7
Q1				.505			
Q2					.783		
Q3			.685				
Q4					.671		
Q6	.561			.424			.437
Q7	.665						
Q8			.538				

Q9	.604						
Q10	.751						
Q11	.500			.472			
Q12	.719						
Q13						.655	
Q14							
Q15				.649			
Q16				.588			
Q17	.724						
Q18	.607	.513					
Q19			.589				
Q20	.535	.540					
Q21	.703						
Q22						.716	
Q23		.609					
Q24			.668				
Q25		.602					
Q26				.601			
Q27			.413	.574			
Q28				.625			
Q29	.503	.554					
Q31			.758				
Q32							.784
Q33		.504			.406		
Q34	.410	.525					
Q35		.622					
Q36	.632						

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a Rotation converged in 12 iterations.

Absolute scores < .50 are not included in the matrix for clarity of presentation

Factor analysis retain 34 items as the two items are deleted as there factor loadings are less than 0.50. According to Hair *et al* for a sample size of 100 or above, the primary factor loading of each item should be at least .5. Moreover, an item that have multiple cross-loadings is candidate for deletion provided that all of them are at the same level (should be a gap of at least ~.2 between primary and cross-loadings). Then other items like Q6, 11, 18, 29, 33, 34 were loaded in multiple factors and the gap between the loadings is less then .2. so as per rule these questions should be discarded.

Factor analysis with principal component analysis with varimax rotation is run again on remaining questions. The overall measure of sampling

adequacy for the set of variables included in the analysis is .921 as shown in table 6. Thus the KMO Barlett's Test testifies to the appropriateness of the factor analysis.

**Table 6 KMO and Bartlett's Test**

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.921
Bartlett's Test of Sphericity	Approx. Chi-Square	3149.334
	Df	351
	Sig.	.000

Again the next step is to test the communalities. Although four variables are going against the rule as discussed above, still researchers retained those variables for further analysis. Out of these four, two variables (Q14 and Q27) are close to .5 and hence retained. The other two variables (Q25 and Q32) were also retained by the researchers for further analysis as they seemed to be important variables to be studied.

**Table 7 Communalities**

	Initial	Extraction
Q1	1.000	.616
Q2	1.000	.772
Q3	1.000	.697
Q4	1.000	.639
Q7	1.000	.653
Q8	1.000	.624
Q9	1.000	.603
Q10	1.000	.679
Q12	1.000	.679
Q13	1.000	.632
Q14	1.000	.496
Q15	1.000	.655
Q16	1.000	.502
Q17	1.000	.618
Q19	1.000	.662
Q21	1.000	.674
Q22	1.000	.617
Q23	1.000	.540
Q24	1.000	.688
Q25	1.000	.455
Q26	1.000	.754
Q27	1.000	.499

Q28	1.000	.779
Q31	1.000	.631
Q32	1.000	.426
Q35	1.000	.608
Q36	1.000	.713

Extraction Method: Principal Component Analysis.

**Table 8 Total Variance Explained**

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	11.181	41.413	41.413	11.181	41.413	41.413
2	1.747	6.470	47.882	1.747	6.470	47.882
3	1.521	5.632	53.514	1.521	5.632	53.514
4	1.358	5.029	58.543	1.358	5.029	58.543
5	1.105	4.091	62.634	1.105	4.091	62.634

Extraction Method: Principal Component Analysis.

**Table 9 Rotated Component Matrix(a)**

	Components				
	1	2	3	4	5
Q1		.569			
Q2				.824	
Q3			.692		
Q4				.669	
Q7	.679				
Q8			.530		
Q9	.640				
Q10	.762				
Q12	.744				
Q13			.598		
Q14		.484			
Q15		.718			
Q16		.617			
Q17	.747				
Q19	.424	.403			.559
Q21	.730				
Q22			.754		
Q23		.523	.482		
Q24				.655	
Q25		.448			
Q26		.688			

Q27		.495			.457
Q28		.708			
Q31			.762		
Q32				.608	
Q35				.603	
Q36	.664				

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a Rotation converged in 7 iterations.

Absolute scores < .40 are not included in the matrix for clarity of presentation

Factor analysis deleted one variable that is Q20 as the condition of absolute scores. Out of the 27 retained items, the factor analysis considered only 22 items that fell within the five interpretable factors. Five items (Q14, Q19, Q23, Q25, Q27) are deleted as a rule of thumb as described above. Fifth factor has only two items loaded that too with very low loadings as a result researchers is not taking into account the fifth factor. Therefore, four factors relating to firm's perception of whether e-payment services are accurate, reliable, fast and effective were loaded and interpreted as follows.

**Table 10 Rotated Component Matrixes (Summarized Final Solution)**

	Components			
	User Friendliness	Compatibility	Data Processing	Trust Worthiness
Q7	.679			
Q9	.640			
Q10	.762			
Q12	.744			
Q17	.747			
Q21	.730			
Q36	.664			
Q1		.569		
Q15		.718		
Q16		.617		
Q26		.688		
Q28		.708		
Q3			.692	
Q8			.530	
Q13			.598	
Q22			.754	
Q31			.762	
Q2				.824
Q4				.669



Q24				.655
Q32				.608
Q35				.603

Table 10 shows the four meaningful factors that are loaded are named as User Friendliness, Trust Worthiness, Data Processing and Compatibility. As indicated in table 10 user Friendliness was the most important factor followed by compatibility, data management and trust worthiness. The results support previous studies by Swaminathan, Elzbieta, and Bharat [14], which revealed that security and privacy issues are no longer the major concerns of users in electronic transactions. Novak, Huffman and Yung [15] also found that security is the least significant factor influencing users' decisions in the electronic environment.

User Friendliness as determined and defined by user perception of handling payment system such as convenience, speed, flexibility, simplicity, ease of use, accessibility and availability. Computability is second important factor that is loaded and attributed as flexibility, ability to pay via various payment methods, Traceability, reload ability, transferability, refundability, technical support and Multiple Currency Payment System. Data Management is the third factor which is loaded as the part of our study. It is characterized by database management, statistical analysis and interoperability infrastructure. Trust worthiness which is loaded as fourth factor is attributed by privacy, security, user authentication, universal acceptance and system comparability.

## 6. CONCLUSIONS

The present study reveals the fact that EPS providing banks have managed to ensure the system user-friendly in terms of cost and usage. The results are in line with the similar study in Malasiya [6]. In the study, researchers found flexibility and user friendliness to be the most important factors of firms' perception towards adoption of EPS. The result of the present study seems to be absolutely fit from firms' perspectives. The literature suggests that when consumers use EPS, they are most concerned about security and trust. But in the case of firms, due to more and frequent number of transactions, compatibility and data processing quality are rated higher than trust and security related factors. The study can present the most evident fact that firms' are satisfied with services provided by bank. But these services are less than the expectations of firm. So banks should be more vigilant towards the need of firms. Since, research is about B2B

transactions, it demands more competitive attitude of banks. Firms' have to deal with institutions, government, other businesses and consumers. All of these stake holders are progressive enough to make use of EPS diligently. So firms' performance depends on EPS providing banks. Thus, we can term it as a circle which has no ends. Researchers suggest that the weaker banks should meet firms' expectations and increase customer satisfaction by learning more about the strategies used by the successful model banks. Banks should provide utmost security and privacy of firms' transaction. This will develop trust amongst firms. Since, UAE is one of the most advanced nation of the world, companies have to deal in multi currency. Banks should develop full proof system which will allow firm to conduct their transaction in any currency effortlessly

## 7. LIMITATIONS

The current study is not without limitation. At the same time these limitations gives implications to the researchers to move further in the current area of research. There are many opportunities for further research using the current factors of the study and the questionnaire in a wider scope. The further research may include other small and mid-sized organizations in UAE to explore the validity and feasibility of current factors, Further there can be other moderating factors like gender, age and education that can finally affect the decision of using e-Payment system. Especially in Arab culture, these moderators become very important to explore.

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