

## Data processing related to the impact of performance expectation, effort expectation, and perceived usefulness on the use of electronic banking services for customers of Jordanian banks

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### ABSTRACT

The aim of this study was to investigate and identify the influence of performance expectation, effort expectation, and perceived usefulness on the usage of electronic banking services by Jordanian bank customers. The study used a quantitative method, with questionnaires administered to Jordanian bank clients. The statistics support the association between performance expectation, effort expectation, perceived utility, and the usage of electronic banking services. This implies that these characteristics have a major influence on Jordanian bank customers' electronic banking services. The association between performance expectation and use of electronic banking services is the strongest, followed by effort expectation and use of electronic banking services, and the poorest between perceived usefulness and use of electronic banking services. Even the most tenuous association (perceived usefulness and use of electronic banking services) is statistically significant. These findings also imply that banks seeking to boost the usage of electronic banking services should concentrate on improving consumers' perceptions of performance and effort expectations, as well as perceived usefulness.

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## 1. Introduction

E-banking is a contemporary banking business model that depends on digitizing all bank operations and activities (Albort-Morant et al., 2022). It is also merely an addition to the standard banking platform that makes it possible to manage accounts, pay bills, and conduct bank transactions quickly and easily via the internet, mobile devices, or SMS (Wang et al., 2017). Whereas internet banking is a financial service that allows bank customers to conduct a variety of online banking activities, such as invoices payment, online transfers, account data inquiries, financial investments, currency exchange, simple transaction verification, and global connectivity via the internet (Tahtamouni, 2022). Therefore, information and communication technology has significantly revolutionized the delivery of financial and banking services, not just in advanced countries but also in developing countries like Jordan (Alsmadi et al., 2022). Electronic banking systems that allow consumers to freely access financial services at a time and location of their choosing are therefore regarded as technical systems in Jordan (Hassan & Farmanesh, 2022). Despite e-banking services' global spread, the bulk of Jordanian bank clients still conduct their financial transactions through conventional methods (Al-Zaqeba, 2022). However, in order to enhance the timeliness and quality of their services, several Jordanian commercial banks are eager to provide their clients with e-banking options (Yaseen & El

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Qirem, 2018). Although e-banking enables speedy execution of financial transactions using technology, demand-side constraints and other unfinished phases still prevent the widespread implementation of cashless technology (Alsmadi et al., 2022). Banks must thus provide multichannel banking in order to remain competitive and ensure that they can communicate with their clients (Rahmatika et al., 2022). In order to provide their customers with better services while also enhancing their efficacy and efficiency, banks tend to be among those that are most interested in such systems (Jarrah et al., 2023). However, the level of client motivation to use mobile banking will ultimately determine its success (Alalwan et al., 2018).

## 2. Literature Review

The way that customers interact with banks has changed as a result of technology, so it is more important than ever to have a thorough understanding of the elements that influence internet banking usage (Ighomereho & Sajuyigbe, 2022), where the researchers have been drawn to study the problems with online banking due to the boom in internet usage and the massive funding of e-banking efforts (Jarrah et al., 2022). On the bank's website, users may use online banking to carry out a variety of electronic transactions (Ly & Ly, 2022). This indicates that online banking serves as a valuable channel for handling financial transactions for bank customers (Fedorko et al., 2021). Many clients are reluctant to use e-banking services despite the benefits and the large investments Jordanian banks have made to incorporate internet banking technologies (Jarrah & AL Jarrah, 2022). Additionally, consumers are still ignorant of the technological features that motivate them to use mobile banking in the long run (Naruetharadhol et al., 2021). One of the elements influencing the willingness to use banking technologies is the perceived utility (Rahmatika et al., 2022). In this case, the intention to use technology clarifies the user's intention to adopt new technology, and customers select a service founded on its perceived usefulness (Namahoot & Rattanawiboonsom 2022).

One of the most lucrative e-commerce applications is banking. In an effort to decrease costs while enhancing client service, the majority of banks have implemented Internet banking systems (Martins et al., 2014). Banking includes the provision of account credentials, money transfers, and online purchasing of financial goods or services (Almatarneh et al., 2022). Through a bank's website, clients may perform a variety of financial services using internet banking (Rahi et al., 2018). In order to establish and record the relationship between consumers' choice to use financial technology services and other aspects, banks must take into account certain service qualities offered to the client, such as simplicity of use, customer trust, and social effect (Alsmadi et al., 2022). As a result, social influence plays a significant role in many facets, as demonstrated by the growth of well-known influential figures like social media influencers (Guetz & Bidmon, 2022).

The ease of use is a key element in how people perceive a technology, according to technology (Jarrah & Almatarneh, 2021). One of the main reasons why consumers of mobile banking services prefer the technology is that it is easy to use and needs little effort (Sarfaraz, 2017). Therefore, their lives should be made easier by the service thanks to its user-friendly design and rapid set-up arrangements, where the banks continued to promote online and mobile banking as extra services for their clients (Kusumawati & Rinaldi, 2020). There is still a necessity to make electronic banking more user-friendly and secure as these are the main barriers to complete support of electronics (Sandhu & Arora, 2022). The development of banking technology has a significant influence on a bank's marketing efforts (Ghani et al., 2022). Findings by Sarfaraz (2017) Analysis showed that users' intentions to utilize mobile banking services are highly influenced by performance expectations, effort expectations, and risk perception.

Similarly, the factors that affect real use and the decision to keep using technology are clearly identified or pinpointed by perceived usefulness (Jarrah & Iskandar 2019). Considered to be a key technological predictor is perceived usefulness (Raza et al., 2017). In contrast to perceived usefulness, which has a strong link with attitude and intention to use mobile banking, perceived ease of use has a large positive correlation with both perceived usefulness and attitude, according to Raza et al., (2017). The desire to utilize mobile banking is positively correlated with one's readiness to use technology. The degree to which a user thinks a piece of technology is simple to use is known as perceived ease of use (Kumar & Krishnan, 2020). The research findings demonstrate that perceived ease of use has a favorable and substantial impact on the desire to utilize technology. Wardana et al., (2022) define perceived ease of use as a person's level of confidence when using technology. According to Rahi et al., (2021) findings the impact size study showed that elements like satisfaction and user expectations were the most crucial in deciding whether a banking user would continue using it.

One of the most important factors influencing the business environment of modern banking organizations is technology (Musa et al., 2019). According to Alshhadeh and Al-Khawaja (2022), financial technology has changed the structure of overall financial services, as well as the diversity and style of financial services for commercial bank clients. However, Pham et al., (2022) discovered that many customers are reluctant to embrace and use online banking services for a variety of reasons, including society, culture, and economy. Alalwan et al., (2018) found that behavioral intention was favorably impacted by performance expectation, effort expectancy, hedonic motivation, price value, and trust, in contrast, perceived benefit, effort expectancy, performance expectation, social influence, hedonic motivation, and price value have a positive influence on behavioral intention, according to Kaur and Arora results (2022). Alsmadi et al., (2022) observed a positive relationship between financial technology intention and the Processing Unit, social effect, customer trust, and perceived ease of use. In addition, Rahi et al., (2019) discovered that the integrated UTAUT model had an influence on user intention to use online banking. Performance expectation, effort expectancy, enabling conditions, social influence, habit, hedonic motivation, perceived worth, and trial ability are all proponents of banking adoption intention, according to Farzin et al., (2021). According to Widanengsih

(2021) research, perceived ease of use has minimal influence on interest in banking; however, attitudes have an influence on interest in banking.

According to Mulyaningsih, (2022) results, customer trust, perceived usefulness, and ease of use, all had a positive effect on customer loyalty in digital banking. Consumer trust is influenced by the ease of use, but perceived usefulness has less impact. Syaharani and Yasa (2022) found that perceived usefulness and ease of use had a significant and positive effect on repurchase intention. According to Kabakuş and Küçükoğlu (2022), there is a partial mediating effect of perceived utility and perceived ease of use on the relationship between the trust factor and the adoption of banking platforms. Wardana et al., (2022) observed that perceived ease of use has a positive and substantial influence on perceived usefulness, and that perceived usefulness has an effect on the intention to use. According to Londa et al., (2022), perceived credibility, perceived ease of use, and perceived usefulness all have a substantial influence on consumer satisfaction while using mobile banking. According to the findings of Usman et al., (2020), expectation performance enhancement, social influence, effort expectancy, condition, and security facilitation will, directly and indirectly, induce enhancement behavior intention behavior use.

According to Jena (2022), there are several important determinants of bankers' intentions to embrace blockchain in financial operations, including enabling conditions, performance expectancy, and initial trust. But to the results of Win et al. (2021), the association between behavioral intention and effort expectation, enabling conditions, price value, social influence, and perceived risk was not identified. However, the effect of behavioral intention on use behavior was substantial. Performance and effort expectations, as well as social influence, have a considerable and favorable impact on the desire to use e-payment systems, claim Alduais and Al-Smadi (2022). Also, Chen et al., (2022), found that social influence both adversely moderates the core route components and directly and significantly boosts the desire to utilize self-service outlets. Trivedi et al., (2022) discovered that in the case of integrity and utility, social influence somewhat but entirely mediates the link between security and user intention. Rahi et al., (2018) found that all four predictors (social influence, effort expectancy, performance expectation, and enabling condition) were significant and had a considerable amount of variation in predicting users' propensity to utilize online banking. According to the findings of Kusumawati and Rinaldi (2020), hedonic motivational variables, habits, and trust have substantial effects on behavioral intentions to use, whereas trust has an effect on effort expectancy, performance expectation, and facilitating conditions.

Fedorko et al., (2021) found that social influence had an impact on respondents when utilizing e-banking. Also, the expected effort element in the study has a considerable impact on the expected performance factor, as demonstrated by original research, which demonstrated the influence of perceived ease of use on behavioral intent and usage. According to the findings of Susanto et al., (2016), perceived security considerably impacts trust, but perceived utility greatly influences trust, user happiness, and desire to continue using, user satisfaction and self-efficacy both have a major impact on future usage intention, user pleasure is greatly influenced by the trust. The findings by Martins et al., (2014) support certain linkages of UTAUT, including the importance of risk as a larger predictor of intention than effort expectancy, performance expectation, and social influence. According to Wang et al., (2017) findings, personalization increases users' expectation of performance while lowering their expectation of effort, which in turn increases their desire to keep using e-banking services. As well as producing an interaction impact on both performance expectation and effort expectancy, compatibility with prior e-banking experience and customization is also important. The findings of Rajasulochana and Murthy (2022), online banking service quality on all dimensions have a substantial influence on customer satisfaction with internet banking consumers. Each of the characteristics, namely efficiency, system availability, privacy, fulfillment, contact, contact, and responsiveness, contribute 71% to the total customers in public and private banks' internet banking. Through the above discussion, the researchers developed the following hypotheses:

**H<sub>1</sub>:** *There is a positive relationship between Performance Expectation and the Use of Electronic Banking Services.*

**H<sub>2</sub>:** *There is a positive relationship between Effort Expectation and the Use of Electronic Banking Services.*

**H<sub>3</sub>:** *There is a positive relationship between Perceived Usefulness and the Use of Electronic Banking Services.*

### 3. Methodology

This study uses a quantitative approach, using surveys among customers of Jordanian banks. The questionnaires were based on previous studies and designed to measure the impact of performance expectation, effort expectation, and perceived usefulness on using electronic banking services among customers of Jordanian banks. The tool consisted of 5 items for performance expectation, extracted from (Davis et al., 1989) and (Venkatesh et al., 2003), and measured by using a Likert scale, where "strongly disagree = 1, to strongly agree = 5". Effort expectation was measured with a 4-item scale, using the same Likert scale and extracted from (Davis et al., 1989), (Moore & Benbasat, 1991), and (Thompson et al., 1991). The perceived usefulness was determined by 3 items, also extracted from (Davis et al., 1989), (Moore & Benbasat, 1991), and (Thompson et al., 1991). The use of electronic banking services was measured by 5 items from (Saunders & Jones, 2021).

The study used both online and offline surveys and participants were selected through random sampling. Data collection took place from September to November 2022. SPSS and AMOS 27 were used to perform measurement validation, confirmatory elements analysis (CFA), and path analysis, while descriptive statistical analysis was also used.

The scale was corrected and divided into three categories, based on the mean scores: “less than 2.33” is considered low, “2.34 to 3.66” is considered medium, and “3.67 to 5.00” is considered high. The sample size for this study was 453 customers of Jordanian banks.

## 4. Results

### 4.1 Exploratory Factor Analysis (EFA)

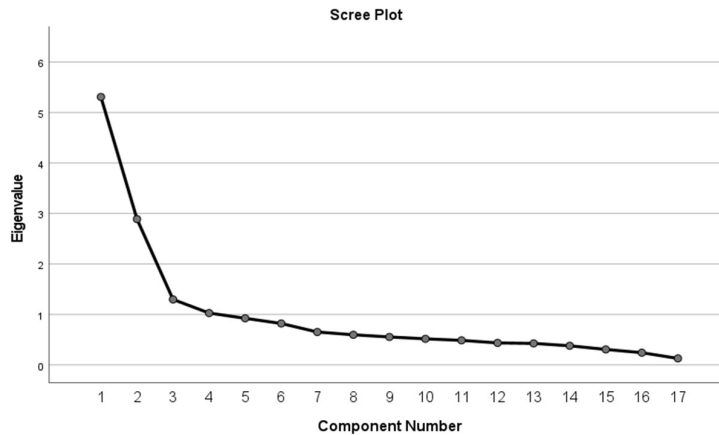
The data collected from 17 items underwent a principal axis factoring (PAF) analysis. To assess the suitability of the data for factor analysis, the Kaiser-Meyer-Olkin (KMO) test (Bartlett, 1954) was performed. The results showed a high KMO value of 0.864, which exceeds the minimum requirement of 0.7 (Lloret et al., 2017) and indicates that the data is appropriate for exploratory factor analysis. A very significant result ( $p < 0.001$ ) was obtained using Bartlett's test of sphericity, which was also used to assess the factorability of the data. This shows that the correlation matrix is not an identity matrix and that some of the variables have substantial relationships. With a level of significance less than 0.0001, Bartlett's test statistic of 3322.213 supported the idea that the variables are not orthogonal. The data set looks to be an excellent candidate for factor analysis with a significant value of less than 0.05.

**Table 1**

Kaiser–Meyer–Olkin (KMO) sample adequacy test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.864
Bartlett's Test of Sphericity	Approx. Chi-Square	3322.213
	df	136
	Sig.	0.000

In the exploratory factor analysis (EFA), all 17 items were analyzed using the Varimax rotation method in a principal component analysis (PCA). The number of initial unrotated factors to extract was determined using Kaiser's criterion and the Scree test. The variance described by each factor's eigenvalues corresponds to the particular linear components. To present only meaningful results, factor loadings with values less than 0.30 (Watson et al., 1995) were suppressed. The final four-factor model had eigenvalues over 1, but as shown in the scree plot in Figure 1, there was a break after the fourth component, and some items had small variances and were close to each other. This 17-item structure was found to explain 61.904% of the variance in the relationships between the items, as shown in Table 2.



**Fig. 1.** Displays the Scree plot output, revealing the presence of four factors in the data

Table 2 presents the factor loadings, eigenvalues, and variance explained for four factors extracted from a principal component analysis. Each factor is composed of items that are highly related to each other based on their factor loadings, which range from 0.540 to 0.935. Higher eigenvalues indicate more variation explained, and the eigenvalues represent the amount of variance explained by each component. The largest eigenvalue, 5.309, is associated with the first factor (Performance Expectation), which explains 17.481% of the variance. The second largest eigenvalue, 2.889, is associated with the second factor (Effort Expectation) and explains 15.510% of the variance. The third and fourth factors (Perceived Usefulness and Use of Electronic Banking Services) explain 15.188% and 13.725% of the variance, respectively (Hair et al., 2010).

**Table 2**  
The results of the exploratory factor analysis (EFA) on the 17-item

Factor1	Factor Loading	Eigen Value		Variance Explained
		Performance Expectation		
a1	0.559	5.309		17.481
a2	0.692			
a3	0.540			
a4	0.690			
a5	0.672			
Effort Expectation				
b1	0.701	2.889		15.510
b2	0.778			
b3	0.826			
b4	0.823			
Perceived Usefulness				
c1	0.832	1.298		15.188
c2	0.935			
c3	0.914			
Use of Electronic Banking Services				
d1	0.628	1.028		13.725
d2	0.664			
d3	0.724			
d4	0.626			
d5	0.726			

All of the items were assessed using a 5-point Likert scale ranging from "strongly disagree" (1) to "strongly agree" (5).

#### 4.2 Reliability Analysis

Table 3 shows that all Cronbach's  $\alpha$  is acceptable for the purposes of the study, where Cronbach's alpha reliability coefficient is acceptable if exceeded (0.60) (Sekaran & Bougie, 2016).

**Table 3**  
Results reliability for each factors

Factor	Cronbach's $\alpha$	N of Items
Performance Expectation	0.719	5
Effort Expectation	0.862	4
Perceived Usefulness	0.898	3
Use of Electronic Banking Services	0.759	5

Table 4 shows that the highest means (3.320) out of (5) were obtained for the domain (1) "Performance Expectation" by medium agreement degree, followed by the domain (3) "Perceived Usefulness" by medium agreement degree (means 3.055), and the lowest means (2.829) were obtained for the domain (2) "Effort Expectation" by medium agreement degree.

**Table 4**  
Means and standard deviation for each domain

Rank	No	Domain	Mean	Standard. Deviation	Agreement Degree
1	1	Performance Expectation	3.320	0.825	Medium
2	3	Perceived Usefulness	3.055	1.426	Medium
3	2	Effort Expectation	2.829	1.099	Medium
Total Means" Use of Electronic Banking Services"			2.943	0.833	Medium

The means total Means" Use of Electronic Banking Services" was (2.943) by Medium agreement degree.

#### 5. Path Analysis

Table 5 presents the results of the path analysis conducted to examine the relationships between the variables in the model. The three paths represented in the table, H1, H2, and H3, represent the relationships between Performance Expectation, Effort Expectation, Perceived Usefulness, and the Use of Electronic Banking Services. The estimate column shows the strength of the relationship between the variables, with higher values indicating a stronger relationship. The P column represents the significance level of the estimate, with \*\*\* indicating a significance level of less than 0.001. The result column indicates whether each relationship is supported by the data, with "Supported" indicating that the relationship is statistically significant.

#### Confirmatory Factor Analysis (CFA)

According to Schumacker and Lomax (2004), a good fit for the model is indicated by an RSMEA value less than 0.05, and values between 0.05-0.08 are still considered acceptable. To be considered a good match, CFI, TLI, and IFI should be medium

than 0.90. The CMIN/DF value should be between 1 and 5. Table 4 presents the fit indices for evaluating the results obtained for the six-factor model of the SATS-36, using the criteria outlined by Schumacker and Lomax (2004).

**Table 5**  
Fit indices for model

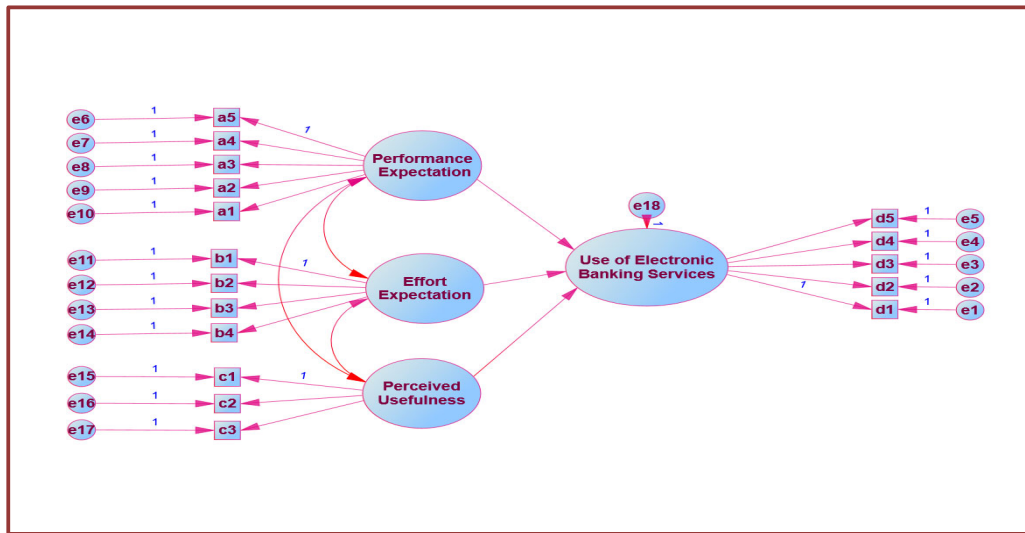
Types	Absolute Fit indexes		Incremental Fit Indexes		Chi-square
	RMSEA	CFI	TLI	IFI	$\chi^2/DF$
Fit indices	0.05-0.08	$\geq 0.90$	$\geq 0.90$	$\geq 0.90$	$1 \leq \chi^2/DF < 5$
Fit indices values	0.055	0.953	0.943	0.953	2.357

The values of the fit indices indicate that the model has a moderate to a good match with the data. The model's “Root Mean Square Error of Approximation” (RMSEA) of 0.055 is within the acceptable range of 0.05-0.08, suggesting that it gives a good approximation of the data. The Comparative Match Index (CFI) and Tucker-Lewis Index (TLI) values of 0.953 and 0.943, respectively, are both more than the suggested minimum value of 0.90, suggesting a satisfactory fit. This is supported by the Incremental Fit Index (IFI) of 0.953. The Chi-square to degrees of freedom ( $\chi^2/DF$ ) ratio of 2.357 is within the acceptable range of 1 to 5, suggesting that the model fits the data well.

**Table 6**  
Path coefficient and their significance

		Estimate	P	Result
H1	Performance Expectation → Use of Electronic Banking Services	0.245	***	Supported
H2	Effort Expectation → Use of Electronic Banking Services	0.243	***	Supported
H3	Perceived Usefulness → Use of Electronic Banking Services	0.076	0.007	Supported

Table 6 shows that the relationship between performance expectation, effort expectation, perceived usefulness, and the use of electronic banking services are all supported by the data. This suggests that these variables have a significant impact on the use of electronic banking services for customers of Jordanian banks. The strength of relationship is strongest between Performance Expectation and the Use of Electronic Banking Services (0.245), followed by Effort Expectation and the Use of Electronic Banking Services (0.243), and weakest between Perceived Usefulness and the Use of Electronic Banking Services (0.076). However, even the weakest relationship (Perceived Usefulness and Use of Electronic Banking Services) is still statistically significant ( $P < 0.007$ ), indicating that it should not be ignored. These results suggest that banks looking to increase the use of electronic banking services should focus on enhancing customers' perceptions of performance and effort expectations, as well as perceived usefulness. Based on Table 6 and additional illustration in Fig. 2, we concluded that H1, H2 and H3 were supported.



**Fig. 2.** The structural model displaying the path coefficients

**6. Discussion and Conclusions**

E-banking alludes to the supply of banking interests via electronic means. Therefore, the pace of change in today's world makes it imperative for every bank to comprehend what its clients want from them because there is a connection between customer happiness and service quality (Rajasulochana & Murthy, 2022). Therefore, the fintech and e-banking adaptation is doable, as fintech and e-banking are the future of finance (Sakhnini et al., 2022, Al-Khawaja et al., 2023). Banking services

include account access, online purchases, and money transfers of financial goods or services (Rahi et al., 2018). There is still a requirement to make e-banking more user-friendly and secure, as these are the main barriers to complete reliance on electronic media (Sandhu & Arora, 2022). The findings Kumar and Krishnan, (2020) and Widanengsih (2021) and Mulyaningsih, (2022) and Syaharani and Yasa (2022) and Kabakuş and Küçükoğlu (2022) and Wardana et al., (2022) and Londa et al., (2022) demonstrate that perceived ease of use has a favorable and substantial impact on the desire to utilize technology. Also, Alalwan et al., (2018) and Farzin et al., (2021) and Usman et al., (2020) and Martins et al., (2014) found that behavioral intention was favorably impacted by performance expectation, effort expectancy, hedonic motivation, price value, and trust, in contrast, perceived benefit, performance expectation, social influence, effort expectancy, hedonic motivation, and price value have a influence on behavioral intention, according to Kaur and Arora results (2022). Alsmadi et al., (2022) observed a positive relationship between financial technology intention and the Processing Unit, social effect, customer trust, and ease of use. Therefore, the purpose of this study was to investigate and identify the influence of performance expectation, effort expectation, and perceived usefulness on the usage of electronic banking services by Jordanian bank customers. The study used a quantitative method, with questionnaires administered to Jordanian bank clients. The statistics support the association between performance expectation, effort expectation, perceived utility, and the usage of electronic banking services. This implies that these characteristics have a major influence on Jordanian bank customers' adoption of electronic banking services. The association between Performance Expectation and Use of Electronic Banking Services is the strongest, followed by Effort Expectation and Use of Electronic Banking Services, and the poorest between Perceived Usefulness and Use of Electronic Banking Services. Even the most tenuous association (Perceived Usefulness and Use of Electronic Banking Services) is statistically significant, indicating that it should not be overlooked. These findings also imply that banks seeking to boost the usage of electronic banking services should concentrate on improving consumers' perceptions of performance and effort expectations, as well as perceived usefulness.

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