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"Technological Determinants of Jordanian Public Universities' Intention to Adopt E-Government: The Moderating Role of Awareness

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Abstract:

E-government is given a lot of weight in the evolution of global information and governance systems. Notwithstanding Jordan's persistent efforts to promote better public services through the use of e-government, the country's citizen adoption rate is actually quite low. This emphasizes how critical it is to determine the obstacles keeping people from adopting these easily accessible e-services. The current study examines the relationship between technology factors (relative advantage, compatibility, and complexity) and intention to use e-government. Furthermore, the moderating effect of awareness is also examined. Data were collected from ten public universities in Jordan through a survey questionnaire, which was distributed to 400 lecturers and administrative staff using a stratified random sampling technique. A total of 379 valid responses were received, representing a response rate of approximately 94%. The Smart PLS tool was used to analyse the data. The results revealed that relative advantage and compatibility are strongly associated with intention to use e-government. Similarly, only one of the three indirect effect hypotheses was supported, indicating that awareness moderates the relationship between relative advantage, compatibility, and intention to use e-government. Accordingly, Jordanian public universities should invest in improving their technical infrastructure and maintaining robust cybersecurity to ensure safe and dependable e-government systems. Additionally, implementing targeted training and awareness campaigns will enhance digital literacy, encourage active user engagement, and reduce resistance to change.

Keywords: E-Government, Relative Advantage, Compatibility, Complexity, Intention to Use, Jordan.

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العوامل التكنولوجيّة وتأثيرها في نية الجامعات الأردنية الحكومية لاستخدام الحكومة الإلكترونيّة: الدور المعدِّل للوعي

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الملخص:

يحظى موضوع الحكومة الإلكترونيّة باهتمامٍ متزايد في ظلّ التطورات العالمية في مجالات الحكومة الرقمية ونظم المعلومات. وعلى الرغم من سعي الأردن الحثيث إلى تحسين جودة الخدمات العامة من خلال تبنّي أنظمة الحكومة الإلكترونيّة، إلا أنّ الواقع يكشف عن تدنّي مستويات الإقبال من قبل المواطنين على هذه الخدمات، الأمر الذي يبرز الحاجة الملحّة إلى تحديد المعيقات التي تحول دون استفادة الأفراد من الخدمات الإلكترونيّة المتاحة. تطرقت هذه الدراسة إلى استقصاء أثر العوامل التكنولوجيّة – والمتمثّلة في الميزة النسبيّة، والملاءمة، والتعقيد – على نيّة استخدام الحكومة الإلكترونيّة. كما تناولت الدراسة الأثر المعدِّل للوعي في العلاقة بين هذه العوامل والنيّة نحو الاستخدام. ولتحقيق أهداف الدراسة، تمّ استخدام استبانة لجمع البيانات من عشر جامعات حكومية أردنيّة. وبالاعتماد على أسلوب العينة الطبقيّة العشوائيّة، تم توزيع 400 استبانة على أعضاء هيئة التدريس والعاملين الإداريين في تلك الجامعات، حيث تمّ اعتماد 379 استبانة صالحة للتحليل، أي بنسبة استجابة بلغت نحو 94.75% . جرى تحليل البيانات باستخدام أداة SmartP ، وكشفت النتائج أنّ الميزة النسبيّة والملاءمة ترتبطان ارتباطاً قويّاً وإيجابياً بنيّة استخدام الحكومة الإلكترونيّة. كما أظهرت النتائج أنّه من بين ثلاث فرضيّات للأثر غير المباشر، لم تُدعَم سوى فرضيّة واحدة، وهي الدور المعدِّل للوعي في العلاقة بين الميزة النسبيّة، والملاءمة، ونيّة استخدام الحكومة الإلكترونيّة. ولتأمين أنظمة حكومة إلكترونيّة موثوقة وآمنة داخل الجامعات الحكوميّة الأردنيّة، توصي الدراسة بضرورة الاستثمار في البنية التحتيّة التقنيّة وتعزيز الأمن السيبراني. كما تؤكد أهمية تنفيذ برامج تدريب وتوعية متخصّصة بصورة متزامنة لرفع مستوى التفاعل والمشاركة الفاعلة للمستخدمين، والحدّ من مقاومة التغيير، وتعزيز مهارات الثقافة الرقميّة لديهم.

الكلمات المفتاحية: الحكومة الإلكترونيّة، الميزة النسبيّة، الملاءمة، التعقيد، النيّة في الاستخدام، الأردن.

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Introduction:

Many governments around the world have greatly enhanced their public service offerings by providing their citizens with online services (Asimakopoulos, Antonopoulou, Giotopoulos, & Halkiopoulos, 2025). The use of ICTs has enabled this outstanding development. Within public administration, the term e-government describes how the government uses ICTs (Grigalashvili, 2022; Mensah, 2023; Nwachukwu & Unachukwu, 2023). The development of e-government has a long history of providing substantial advantages to its users (Kawabata & Camargo Jr, 2023). It is crucial for reducing corruption, improving administrative efficiency, and enhancing the quality of services provided. Furthermore, it promotes transparency, e-democracy, and a citizen-centric approach.

Governments and people are unable to fully realise the tremendous potential of e-government because of its low adoption rate. (Kumar, Sachan, & Mukherjee, 2023). According to Iong and Phillips (2023), the progress of e-government hinges on a comprehensive understanding of the factors that influence individuals' decisions to utilize e-government services. While the literature is extensive, a significant research gap remains in examining the citizens' perspectives on the demand side of e-government, unravelling the need for further investigation (Nambassa & Suswanta, 2025). It is important to meticulously examine the factors that have a significant impact on the implementation of e-government, as emphasized in the literature (Rodríguez-Correa et al., 2025).

E-government services aim to promote transparency and improve public sector governance through electronic channels in order to enhance government performance (Aprilina, Dompak, Salsabila, & Lodan, 2025; Bhatti, Hussain, Ahmad, & Nawaz, 2025; Taufiqurokhman et al., 2025). Many governments around the world continue to struggle with the persistent issue of low citizen usage of e-government services, despite significant efforts (Joseph, 2025; D. T. Nguyen et al., 2025). AbdulKareem & Oladimeji (2024), Ashari & Kusbandrijo (2025), Mushtaq & Shah (2024) highlight the general public's lack of interest in e-government services, and contend that in order to promote a better understanding of the advantages of the system, this apathy needs to be addressed and changed. One issue that frequently generates a significant discussion is the effectiveness of the e-government initiative. Many researchers believe its success largely depends on the critical function of a particular factor. It is clear from reviewing a large number of studies on the implementation of e-government in emerging economies that the crucial role of awareness is being significantly overlooked. In essence, there is a notable correlation between the adoption of e-government services and the perceived comprehensive advantages, which is strongly influenced by the level of citizen awareness of these services (El-Gamal, Abd El Aziz, & Abouelseoud, 2022; Hidayat Ur Rehman, Ali Turi, Rosak-Szyrocka, Alam, & Pilař, 2023; Mandari, 2021). Establishing a comprehensive e-government success model that can be used to assess the level of awareness is essential to addressing this gap.

A range of variables has been examined in many studies (Khurshid et al., 2022; Méndez-Rivera, Patiño-Toro, Valencia-Arias, & Arango-Botero, 2023) to assess the extent to which technological factors influence the intention to use e-government. Relative advantage, compatibility, and complexity were the factors investigated in this study (Mndzebele, 2013; Parthasarathy, Kern, Knight, & Wyant, 2019). Therefore, it is crucial to establish whether the intention to employ e-government services for business-to-business (B2B) incoming and outgoing communication and

business-to-consumer (B2C) communication and order management is positively associated with the relative advantages of industry compatibility and complexity. (Abied et al., 2022; Méndez-Rivera et al., 2023; H. Zahid, Ali, Abu-Shanab, & Javed, 2022). Shahadat, Nekmahmud, Ebrahimi, and Fekete-Farkas (2023) define technological context as a group of technologies that an organization can use to facilitate innovation adoption. Pizam et al. (2022) identified five technological characteristics, and Panigrahi, Azizan, and Shamsi (2021) examined thirty unique innovation attributes. Among these, ccompatibility, complexity, and relative advantage were constantly highlighted. Ahmad, Ahmad, and Hashim (2016) concluded that these three traits influence an organization's decision to adopt or reject innovation.

For over a decade and a half, Jordan has implemented an e-government strategy, a significant initiative. However, it is noteworthy that this strategy has not been successful in fostering a greater level of engagement with e-government services among citizens (Abdalla, 2023; Abulhaija, Arroyabe, Kwong, & Zeng, 2025; Alassaf, 2024; AlHussainan, AlFayyadh, Al-Saber, & Alkandari, 2022). According to research by United Nations, Jordan's e-government development index dropped from 50 in 2020 to 98 in 2024, confirming this finding (UN, 2020, 2024).

Despite the effort put into enhancing e-transformation in Jordan, the adoption of e-government services remains low, particularly by public universities that are assumed to play a critical role in advancing this transformation. The technological factors such as relative advantage, compatibility, and complexity are key factors in influencing the adoption of e-transformation, yet little is known about their actual impact on implementing e-transformation. Furthermore, there remain other factors that are also critical such as the awareness of employees regarding the use and shift to e-government services in Jordanian public universities, and how such level of awareness can drive the adoption or rejection of such services.

The paper aims to answer the following research questions:

1. To what extent do relative advantage, compatibility, and complexity influence the intention to use e-government services by employees at Jordanian public universities?
2. Does awareness play a moderating role in the relationship between relative advantage, compatibility, and complexity with respect to the intention to use e-government services by employees at Jordanian public universities?

Literature Review:

Relative Advantage and Intention to Use E-Government:

Since relative advantage affects how many people will adopt new technology, goods and services, it is a topic of considerable debate (Azhar, Zahari, Ferdian, & Hanafiah, 2025). According to Moore and Benbasat (1991), relative advantage is an appropriate perceptual notion because it can be applied across disciplines to assess the extent to which a new period is perceived as more fulfilled than its predecessor. Behera, Bala, and Rana (2024) clarify that relative advantage is used to describe the degree to which individuals perceive a new era as superior to the one that came before it. E-government has a relative benefit in that it enables clients to make transactions regardless of time or location (AbuAkel & Ibrahim, 2023; Alryalat, Alryalat, Alhamzi, & Hewahi, 2023; Dilhani & Priyashantha, 2021). E-government provides users with a significant advantage

over traditional payment methods since it enables them to conduct economic transactions anytime and anywhere (Batool, Gill, Javaid, & Khan, 2021; Das & Das, 2022).

Additionally, the ability to employ e-government both online and offline not only contributes to valuable technological innovation (Qin, Wang, Deng, & Hao, 2025) but also enhances its relative advantages. According to empirical research, relative advantage predicts and impacts consumers' intentions to utilise technology (Arthur, Salifu, & Abam Nortey, 2025; Junnonyang, 2021; Shaikh & Amin, 2025; Yunior & Augustine, 2024). Various IT-related domains have examined relative benefit, such as e-government (Falih et al., 2024), instant messaging (Raman et al., 2024), net and mobile banking (Lan & Huong, 2023), and the establishment of an online presence (Sijabat, 2024). Customers are more likely to choose simpler technologies that offer greater relative advantages. However, they are also more open to using more complex technologies that satisfy their needs and have little ambiguity (Putri & Alversia, 2024). Based on a thorough review of the relevant literature, this study proposes the following hypotheses:

H1: Relative advantage has significant positive effect on intention to use e-government.

Compatibility and Intention to Use E-Government:

The importance of internet compatibility in the successful implementation of e-government is highlighted by Alzubi, Ismaeel, and Ateik (2021). Their study demonstrates how crucial this component is to a successful deployment of e-government. The propensity of individuals to utilize e-government services dramatically escalates when they have a computer and a reliable internet connection at their disposal (Sung & Lee, 2025). A. Zahid, Saeed, and Alshurideh (2024) found that one of the variables impacting the delayed desire to utilise e-government was a lack of computer access. Customers' lack of access to suitable personal computers is the main reason e-government is not used more frequently, claim Gupta, Hooda, Jeyaraj, Seddon, and Dwivedi (2024). They maintain that the compatibility between computers and the internet was a significant factor in the customers' decision to adopt e-government services. Results show that compatibility is positively correlated with the intention to use e-government (Abubakari, Zakaria, & Musa, 2024; Senali et al., 2023; Zahid, Ali, Abu-Shanab, & Javed, 2022; Zubir & Abdul Latip, 2024). Given that the majority of respondents currently possess computers and have an internet connection, government support and lower computer and internet costs for consumers may be one contributing factor. Senali et al. (2023) proposed that an innovation that contradicts people's core values and beliefs is less likely to be utilized promptly compared to one that aligns with their principles. The importance of compatibility cannot be understated when it comes to individuals choosing to use a new technology. The rationale behind this is that it enables them to incorporate the new technology easily into their daily routines without requiring significant changes to their lifestyle (Lu, Huang, & Wang, 2022). Chanda, Vafaei-Zadeh, Hanifah, and Ramayah (2024) assert that the adoption of new technology is frequently impeded by the need to break old habits and create new ones. Compatibility and the propensity to use technology are significantly correlated according to Xavier, Susainathan, Antonymuthu, Antony, and Parayitam (2024), Nawi et al. (2024), and Şahin, Doğan, and İlic (2025). They highlight the significant link between compatibility and the inclination to use technology. As a result, this has led us to develop the following hypothesis:

H2: Compatibility has a significant positive effect on intention to use e-government.

Complexity and Intention to Use E-Government:

Complexity is a measure of how difficult a system is to use or comprehend. This specific factor has a considerable impact on people's willingness to adopt a new technology. D. M. Nguyen, Chiu, and Le (2021) claim that users become less satisfied with a system when they perceive it as overly complex, which decreases their propensity to use it. Ursavaş (2022) and Asastani, Kusumawardhana, and Warnars (2018) presented strong evidence that, within the frameworks of the TAM and UTAUT models, system complexity can considerably reduce perceived usefulness, and ease of use, two important factors influencing user behaviour. Our study findings demonstrate how critical it is for system developers to prioritize designs that are intuitive and easy to use. This strategy is essential for raising user adoption rates.

Foroughi et al. (2024) found that the intention to use educational technology was positively correlated with low perceived complexity, confirming the significance of effort expectancy in the UTAUT model. Additionally, the adoption of service robots was studied (Li & Wang, 2022). They found that users' intentions to adopt service robots were weakened because they believed that a system's usefulness diminished as its complexity increased. Kim, Liu, Fang, and Wirtz (2024) claim that simplifying a system not only makes it simpler to use but also increases other predictors like user trust and perceived utility. Previous studies revealed that the perception of a system's complexity has a significant impact on how well a technology is accepted. It is also suggested that simplifying systems is the way to increase users' participation. This viewpoint is not limited to general technology alone; it also applies to e-government, where adoption decisions are heavily influenced by system complexity, as demonstrated by Fürst, Pecornik, and Hoyer (2024).

A significant relationship between perceived user-friendliness and propensity to use e-government services among Indonesian university students was reported (Dwianto, Darmawan, Santoso, & Pribadi, 2023). However, they found that system complexity undermined user confidence, serving as a major barrier to its adoption. Méndez-Rivera, Patiño-Toro, Valencia-Arias, and Arango-Botero (2023) applied the UTAUT model to reiterate how reducing complexity increases the likelihood of adoption. Previous research addressing intention to use e-government has shown that it is strongly influenced by the expected level of effort. Customers' perceptions of the usability of e-government services have a considerable impact on their opinions (Zubir & Abdul Latip, 2024; Trang Nguyen, Nguyen, Huynh, Vrontis, & Ahmed, 2024). According to Thi Nguyen (2023), during the COVID-19 pandemic, intentions to use e-government portals were more significantly influenced by the perceived ease of use than by perceptions of health risk. According to S. Ahmad and Dhoon's (2024) cross-national study, complexity reduces users' trust and satisfaction, which discouraged individuals from utilising e-government systems. These results show that reducing complexity is crucial to boosting the use of digital public services. In the context of this study, the following hypothesis is proposed:

H3: Complexity has a significant positive effect on intention to use e-government.

The Moderating Role of Awareness:

ICT specialists in Jordan assert that potential users of the e-government systems are well-informed about its operations (ALQudah & Muradkhanli, 2024). The systems will be widely used if people are aware of them (Harisanty, Anna, Putri, Firdaus, & Noor Azizi, 2024). It can be inferred that e-government services will spread more widely as more people are aware of them and vice versa. Furthermore, prior research on the connection between behavioral intention and UTAUT constructs produced contradictory results (Alawamreh et al., 2023; Aziz, Rasdi, Rami, Razali, & Ahrari, 2022; Huang, 2023; VanDeWiele, Hastings, Evans, O'Connell, & Flynn, 2025). Therefore, to gain a clearer understanding, it becomes necessary to revisit prior studies when discrepancies and conflicting results are encountered (Mitchell & Jolley, 1992; Mulili, Maina, & Kinyuru, 2025). Nonetheless, Baron and Kenny (1986) presented a method for examining the moderating effect in scenarios where the outcomes of previous research were ambiguous.

According to AbdulKareem and Oladimeji (2024), citizens who do not understand how the e-government operates are less likely to participate in and take advantage of its services. According to Juratli (2021), moral norm development requires awareness, but that awareness is sadly lacking in developing nations, particularly with regard to e-government services. It is noteworthy to observe that esteemed researchers and experts in the field of ICT have pinpointed the slow progress of Jordan's e-government implementation due to a distinct lack of public awareness (Nofal, Al-Adwan, Yaseen, & Alsheikh, 2021). To illustrate, Alkhwaldi and Al Eshoush (2022) assume that Jordan's slow adoption of e-payments was caused by a lack of knowledge about the benefits of the system. As a result, awareness is essential to support the growth of e-government in Jordan. Obeidat (2022), and Chiemeke and Evwiekpaefe (2011) state that the Economist Intelligence Unit noted in 2006 that the barrier to the successful use of e-commerce services is the lack of thorough public awareness regarding the efficient use of technology. Importantly, the researchers' hypotheses, specifically those relevant to the moderating role of awareness in the relationship between behavioral intention and the UTAUT constructs, were not supported (Hassan & Hsbollah, 2019). Awareness can be used as a moderating variable to reduce the influence of relative advantage, compatibility, and complexity on the behavioral intention to use e-government services. This study aims to highlight the critical role that awareness plays in regulating these important factors which may increase the effectiveness of electronic government platforms. It is expected that the framework for technological awareness will control these connections. This assertion is made with a more formal tone to reinforce its significance.

As a critical component in comprehending the factors that influence the intention to use e-government services, awareness has been the focus of our study. Given the apparent correlation between these three factors and the intention to use e-government services in Jordan, awareness has been found to be a third variable that clarifies the relationship. The main objective of this study is to determine how various factors influence awareness as a moderating variable, which in turn affects employees' willingness to adopt new technology in Jordanian public universities. Park et al. (2022) found that employees' decisions to adopt new technologies were frequently influenced by the pertinent criteria. Thus, the following hypotheses are presented.

H4: Awareness moderates the relationship between relative advantage and the intention to use e-government.

H5: Awareness moderates the relationship between compatibility and the intention to use e-government.

H6: Awareness moderates the relationship between complexity and the intention to use e-government.

Conceptual Framework:

This research's fundamental idea is based on the UTAUT model. Finding the crucial elements that affect the decision to use e-government services is the main goal of this theory. Accordingly, relative advantage, compatibility, and complexity are the primary factors that influence users' propensity to use e-government systems for their daily needs. The moderating factor of awareness is also included in this methodology which may increase or decrease the impact of these factors on the intention to use. By incorporating awareness into the framework, the study seeks to offer a more thorough understanding of the adoption process, particularly, in settings with low awareness levels like Jordanian public universities. In addition, the formulation of hypotheses in this framework encourages the empirical investigation of the relationships between these variables to enhance e-government implementation strategies.

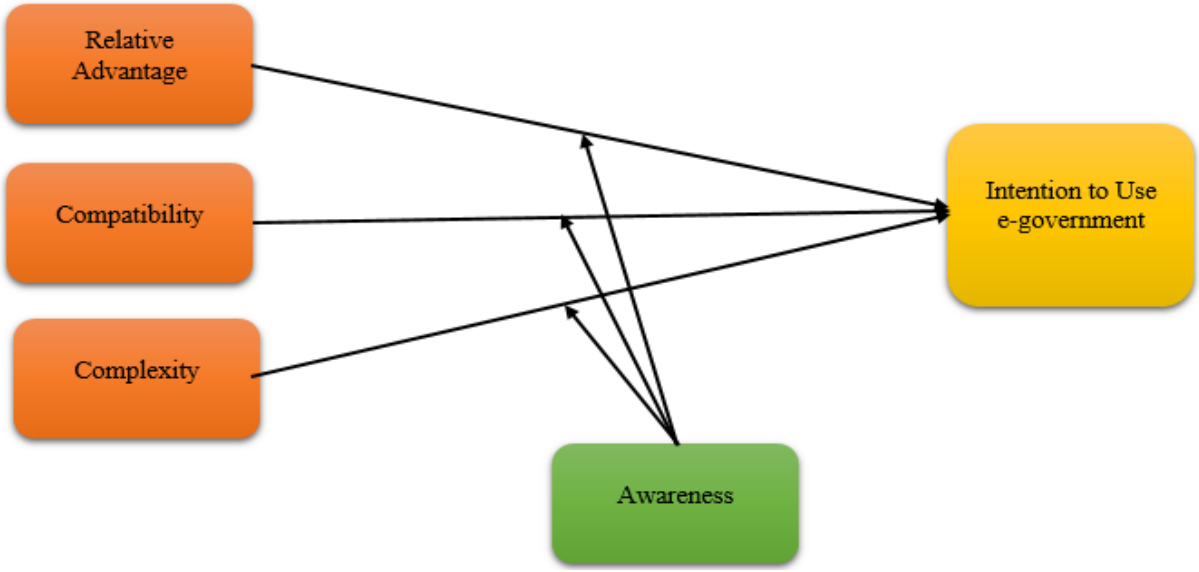

Figure 1: Conceptual Framework

Data Instrument:

To accurately measure the components of the study model, the questionnaire items had to be straightforward. To justify the development of the questionnaire items, Zikmund, Babin, Carr, and Griffin (2012) used conceptual explanations from the literature, which were then adopted or modified as necessary. Some survey items were adopted or modified from previous studies of a similar nature. To meet the objectives of the study, the questionnaire was further refined, as presented in Table 1.

Table 1: Measuring Tools

No.	Variable	No. of Items	Adapted
1	Intention to use e-government	7	(de Souza, d'Angelo, & Lima Filho, 2022; Zahid et al., 2022)
2	Awareness	5	(Chan, Hon, Chan, & Okumus,2014)
3	Relative advantage	4	(Azhar, Zahari, Ferdian, & Hanafiah, 2025; Mndzebele, 2013; Pullen, 2012)
4	Compatibility	3	(Azhar et al., 2025; Mndzebele, 2013; Pullen, 2012)
5	Complexity	6	(Mndzebele, 2013; Pullen, 2012)

The focus on academic and administrative staff is purposeful as they are the primary users of internal e-government functions in public universities, whereas students and IT technicians interact with different systems. We acknowledge this as a limitation and note it for future research. Common method bias is unlikely to threaten the results, as full collinearity VIFs (1.057–3.995) fall well below accepted thresholds, and this will be made clearer through supplementing with Harman's single-factor test if required. The adapted measurement items demonstrated strong validity and reliability, and the expert review process is briefly described below to ensure their contextual suitability. Finally, we specify that SmartPLS automatically standardizes latent variables when creating interaction terms, thereby satisfying the requirements for proper moderation analysis.

It has been crucial for the researcher to ensure the validity of the instrument used. For this purpose, multi forms of validation have been adopted. First, content validity has been established with reliance on well-validated scales that are widely used and circulated in similar research areas. Constructs of relative advantage, compatibility, complexity, awareness and intention to use e-government were measured using already validated instruments established and tested in prior literature.

Second, face validity has been also established based on feedback and revisions done by external reviewers and experts from relevant fields. This is to ensure the representativeness, clarity and relevance of each item. Minor rewordings have been received and incorporated to some of the items to ensure their compatibility with the context of Jordanian public universities' e-government.

Third, the subsequent statistical assessment relied on Cronbach's Alpha, Composite Reliability, AVE, VIF, HTMT, and Fornell–Larcker criteria to ensure the reliability and validity of the data and instruments. These tools have jointly helped to solidify the theoretical and empirical quality of the present paper.

Population and Sample Size:

Population is defined by Sekaran and Bougie (2010) as the total group of people, things, or events that a researcher is interested in examining. This study concentrated on the whole workforce of the Jordanian public universities. The important role that the Jordanian public universities plays as a conduit between the state and the people is the justification for choosing their faculties. Pacheco-Blanco and Bastante-Ceca (2016) contend that the contribution of these institutions to societies is vital because they are able to implement governmental policies and strategies that support the promotion of sustainable practices. There are ten public universities in Jordan, and as of 2024, there were 27891 employees working (MOHE, 2024).

Table 2: Number of staff at public universities in Jordan

University Name	Number of University Staff
University of Jordan	5742
Mutah University	1246
Yarmouk University	3269
Jordan University of Science and Technology	4672
The Hashemite University	1992
Al albayt University	1599
AL-Balqa Applied University	5801
AL-Hussein Bin Talal University	1493
Tafila Technical University	1317
German Jordanian University	760
Total	27891

As the sample size increases, the probability of an error tends to decrease (Zikmund, Babin, Carr, Griffin, 2010). Consequently, statistically significant results are more likely to be obtained from samples that are sufficiently large. For a population of 30000 to 40000, a sample size of at least 379 respondents is required. It is essential that this study has a minimum sample size of 379 respondents because the table shows that there are 27891 employees in Jordanian public universities (Sekaran & Bougie, 2016).

Results:

A common statistical tool in the fields of management and social sciences is the PLS-SEM technique to examining the structural connections between latent variables in multivariate data sets. The validity of theoretical models is evaluated using tests (convergent, validity, composite reliability, and Cronbach's alpha). To verify the integrity and dependability of underlying variables in a research model, the SmartPLS software was used in one study. The findings for each construct have significant Cronbach's alpha scores. This shows that the components of each construct accurately evaluate the underlying invisible construct. Composite reliability is an additional metric

for internal consistency and dependability that is expressed in formal terms. Additionally, the results that fall between 0. 886 and 0. 933 support the validity of the research construct, which indicates strong internal consistency when generally surpass 0. 8. The Average Variance Extracted (AVE) has been used to evaluate the convergent validity of our constructs. Our AVE values which ranged from 0. 607 to 0. 775 are all above the suggested cut-off of 0.5. It would indicate that the constructs have more variance with respect to their respective indicators than with regard to the measurement error, and that the convergent validity is quite strong. Identified as the Variance Inflation Factor (VIF), the numerical values found in the collinearity matrix range from 1 to 3. 99. This implies that multicollinearity is not a significant concern in our research model as supported by Hair, Page, and Brunsveld (2019). As shown in Table 3, it is safe to conclude that our model is robust and provides a strong foundation for structural modelling and hypothesis verification.

Table 3: Ensuring the Reliability and Validity of the Constructs

Constructs	Cronbach alpha	Composite Reliability	AVE	VIF
Relative advantage	0.903	0.906	0.753	3.030
Compatibility	0.836	0.901	0.700	3.062
Complexity	0.915	0.933	0.607	1.057
Intention to use e-government	0.855	0.901	0.775	3.995
Awareness	0.886	0.886	0.612	2.561

The Heterotrait-Monotrait Ratio (HTMT) matrix results are found in the SmartPLS software architecture. As shown below in Table 4, this information is an essential metric for assessing discriminant validity in the context of SEM. Discriminant validity guarantees that the latent variables or constructs in the model are distinct. To calculate the HTMT values among the different latent constructs shown in the matrix, the square root of the AVE for each construct is first calculated. The correlations between the constructs are then compared with these findings. All of the HTMT values fall below the 0. 85 cut-off indicating good discriminant validity.

Table 4: The Formal Analysis of the Heterotrait-Monotrait Ratio (HTMT) Matrix

Constructs	Relative advantage	Compatibility	Complexity	Intention to use e-government	Awareness
Relative advantage	0.071				
Compatibility	0.110	0.195			
Complexity	0.195	0.162	0.186		
Intention to use e-government	0.129	0.152	0.178	0.269	
Awareness	0.173	0.127	0.191	0.133	0.806

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An assessment of discriminant validity in the SmartPLS analysis, which is carried out in accordance with the Fornell-Larcker criterion guidelines, is shown in Table 5. This criterion is utilized to determine the degree of differentiation between unique latent constructs in a structural equation model. When the diagonal elements representing the AVE values exceed their corresponding off-diagonal elements, it indicates the presence of dissimilar latent constructs. It is evident from closely examining each component that the AVE values are higher than the squared correlations for every other component in the model. This demonstrates unique traits of the underlying phenomena, suggesting satisfactory discriminant validity. This strengthens confidence in the distinctiveness of the constructs and the overall validity of the model.

Table 5: Fornell–Larcker criterion

Constructs	Relative advantage	Compatibility	Complexity	Intention to use e-government	Awareness
Relative advantage	0.085				
Compatibility	0.100	0.176			
Complexity	0.184	0.159	0.175		
Intention to use e-government	0.091	0.110	0.139	0.167	
Awareness	0.163	0.105	0.182	0.189	0.723

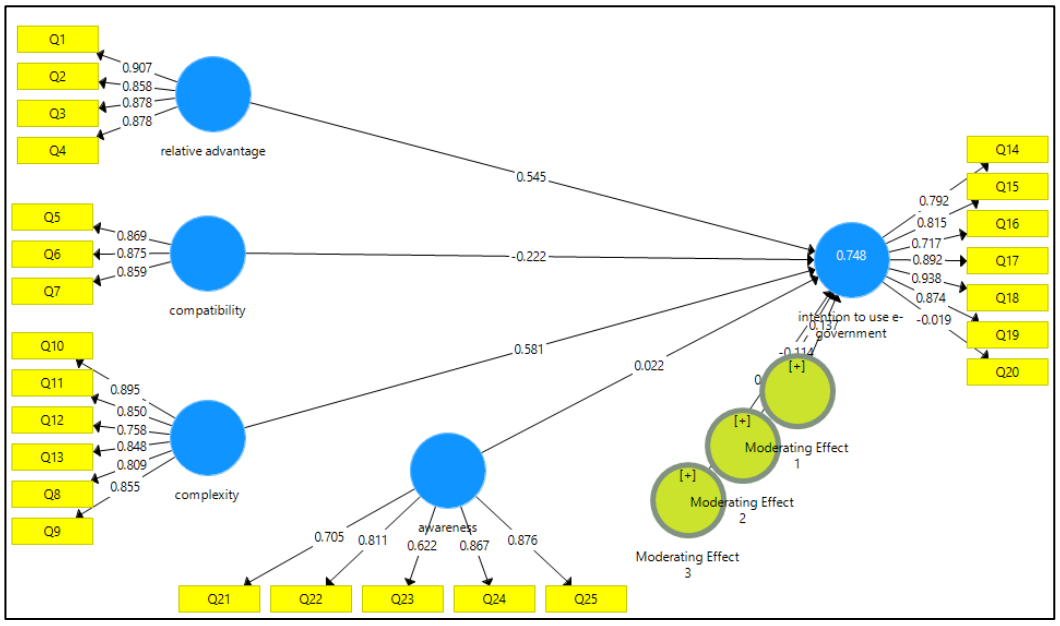

Figure 1: The PLS-SEM model developed using the primary data

Structural Model and Hypothesis Testing

As described in (Hair Jr et al., 2019), we used the PLS-SEM and the bootstrapping method to examine structural relationships in our study. R2 was used with standardised path coefficients to evaluate the model's fitness. There were no problems with multicollinearity, and the results showed high R-squared values with exogenous factors explaining 75% of the variance in the intention to use e-government. The table below presents the results of a SEM or path analysis in a formal setting and clearly illustrates the outcomes of the SmartPLS analysis. Table 6 displays the path coefficients T statistics and p-values related to each distinct path in our model. Significant understanding of the factors influencing the intention to adopt e-government has been made possible by the SEM. the results unravelled high T statistic = 5. 574, and path coefficient (β) = 0. 545. It is clear that relative advantage significantly influenced the intention to use e-government. With a strong correlation $p<0.05$, Hypothesis 1 was supported. Furthermore, with a beta value = 0. 222, and T statistic = 2. 068, it is clear that compatibility has a significant impact on the intention to use e-government, supporting Hypothesis 2 and showing a statistically significant result $p<0.05$. Hypothesis 3 was also supported by the beta value = 0. 581 and T statistic = 5. 631 $p<0.05$. This revealed that complexity has impact on intention to use e-government services.

Table 6: Path coefficients, T values, and p-values

	Path coefficient	T values	p-values	Result
Relative advantage → intention to use e-government	0.545	5.574	0.000	Supported
Compatibility → intention to use e-government	0.222	2.068	0.000	Supported
Complexity → intention to use e-government	0.581	5.631	0.000	Supported
Relative advantage*awareness → intention to use e-government	0.399	2.298	0.000	Supported
Compatibility*awareness → intention to use e-government	0.432	2.117	0.000	Supported
Complexity*awareness → intention to use e-government	0.137	1.887	0.065	Not Supported

Moderation analysis:

The relationship between technological components (relative advantage, compatibility, and complexity) and intention to use e-government was investigated. Furthermore, this study focused on investigating the influence of consciousness as a critical determinant. Confirming Hypothesis 4, it was found that adding awareness considerably reduced the disparity resulting from the direct impact of relative advantage on the intention to use e-government at $p<0.05$. Additionally, results showed that incorporating awareness significantly reduced the disparity caused by the direct influence of compatibility on intention to use e-government services. This effectively confirmed hypothesis 5 $p<0.05$. However, it was found that although awareness did decrease the errors brought about by the direct effect of complexity on the intention to use e-government, this did not substantiate hypothesis 6.

Discussion:

The main goal of the current study is to conduct a critical analysis of the technological factors that influence Jordanian public universities' decisions to adopt e-government. The study reveals that that three factors have a significant impact on the intention to use e-government. In addition to having a robust technical infrastructure and sufficient support services, this also includes the tactics and actions taken by organizations to increase digital literacy. Moreover, the study highlights the degree of confidence in security and privacy issues. Academics' attitudes toward using e-government services are generally positive due to these factors. The majority of the hypotheses proposed regarding the variables affecting Jordanian public universities' readiness to adopt e-government were supported. Certain cultural factors may have an impact on people's adoption of e-government. This result is consistent with the previous research in this context, showing that consumers' attitudes toward the adoption of e-governance are significantly influenced by a number of additional pre-identified factors. Furthermore, the results showed that various factors significantly impact people's perceptions of e-government.

Additionally, Aleisa's (2024) research serves as the foundation for our study's findings. By consistently highlighting the negative impacts of various factors on perceptions of e-government, the essay has significantly advanced the field's understanding. The research findings indicate that, in the current digital era, user intention is a major factor in the acceptance and uptake of e-government services. As a result, this enhancement increases the availability and effectiveness of public services. Our findings support previous research by Muhammad and Kaya (2023) which found that user intentions have a significant impact on e-government adoption in the current digital era. Consequently, this greatly increases the efficacy and accessibility of public services. Xavier et al. (2024), Nawi et al. (2024), and Şahin et al. (2025) demonstrated how public opinion has a significant impact on the uptake of e-governance services. Aziz et al. (2022), Huang (2023), VanDeWiele et al. (2025) show that moderating factors like people's awareness level affect the relationship between their emotions and their use of e-government.

Fahmi et al. (2024) emphasize how important it is to have a citizen-focused approach. They suggest that every e-government system regardless of level should give users' unique needs and requests top priority and accommodate them, as supported by (Singh, Kumar, Paliwal, Verma, &Rajak, 2022). It is impossible to exaggerate how crucial these researchers' citizen-centric approach is. The potential to greatly raise living standards, enhancing, citizen satisfaction, and expediting the efficiency of public service delivery is enormous. The case for a more citizen-focused approach in e-government systems is further strengthened by the endorsement of this viewpoint (Aljawarneh, Kader Alomari, Alomari, Taha, & Obeidat, 2022). They argue that accessibility and confidence-building are crucial elements of this approach. This may highlight the importance of this approach for developing e-government systems as a single window for service access and value addition.

It was found that technology is essential to the adoption of e-government in line with the technology-organization-environmentframework. Because they are government-run semi-autonomous institutions, Jordanian public universities are particularly concerned with the quality of their technical infrastructure and how easy it is to integrate new systems with existing platforms. Organizations with more advanced IT resources, internet access, and secure data systems are better equipped to use e-government platforms. In the public sectors, efforts to undergo digital

transformation emphasizes how important infrastructure is. However, the study provides new insights regarding the moderating role of awareness in this relationship. More specifically, awareness is the institutional and individual understanding of the benefits, characteristics, and strategic significance of e-government mechanisms.

Increased awareness of the benefits of technology greatly increases the intention to use e-government services, as the research findings unequivocally demonstrate. Strong technological systems, in particular, are more likely to result in a strong intention to adopt when university employees are aware of the advantages and potential of e-government services. This moderating effect can be explained by the UTAUT model which maintains that facilitating conditions and performance expectancy influence behavioural intention, but are often mediated by users' perceptions and awareness. Even a highly developed technological infrastructure may be underutilized in institutions with low awareness due to scepticism, resistance to change, or a lack of perceived relevance.

Conclusion and Implications:

In conclusion, this study has clarified the complex framework that Jordanian public universities use when attempting to execute e-government projects. The Kingdom's youthful population, widespread smartphone use, and government commitment may all be responsible for its notable advancements in digital governance. Many issues such as resistance to change, low levels of digital literacy, and worries about privacy and data security continue to seriously impede the adoption of e-government. The conclusions reached here are consistent with pertinent research emphasizing the value of customized legislative actions. In addition, awareness and education campaigns are needed to reduce inequalities and ensure equitable access to e-government services. As Jordanian public universities continue their pursuit of a society with greater digital inclusivity, it becomes crucial to address these influencing factors and barriers to bring about the desired change.

But rather than merely being recognized, technological advancements are actively employed to enhance service delivery and speed up procedures in high-awareness environments. There are important management and policy implications of these findings. While investing in technical infrastructure is still essential, it is not enough to guarantee that e-government will be successfully adopted. Campaigns to raise awareness, training sessions, and strategic communication are all equally important in converting technological potential into actual institutional behaviour. Universities must therefore adopt a two-pronged strategy, developing a culture of digital engagement, awareness, and improving technical proficiency.

This study advances the theoretical understanding of e-government adoption. The findings support the design of effective policies and services. The goal of the study is to enhance government services, promote trust and involvement in digital public services, and advance e-government initiatives in Jordan. It provides valuable insights into accelerating the Kingdom's digital transformation and aligns with current trends in digital transformation, highlighting the significance of cultural considerations in e-government adoption.

Future Research Directions and Limitations:

The study that investigated the factors affecting and hindering Jordanian public universities' adoption of and continued intention to use e-government not only identified several shortcomings but also provided important directions for future research. A significant drawback of using self-reported data is that it may introduce response and social desirability biases which compromise the reliability of the results. Stakeholder qualitative insights were also not extensively explored in the study which mostly focused on a numerical analysis of the technological factors influencing the intention to use e-governance. To overcome these constraints and obtain a better grasp of the underlying dynamics, future research may employ mixed-methods techniques like focus groups or in-depth interviews with locals and government officials. It is recommended that future research on the adoption of e-government at Jordanian public universities look into the effects of cutting-edge technologies like blockchain and artificial intelligence in order to provide policymakers with relevant data that would improve the digitization of public services. Moreover, these studies should take into account the influence of societal factors as well.

We highlight here that the findings of this paper can be understood in light of operational realities of Jordanian public universities, where systems perceived as complex are also viewed as more advanced, institutionally endorsed, or more secure, thereby increasing employees' use of such systems. However, this context signals other areas of concerns, for example, complexity may indicate greater functionality rather than extra burden to deal with. We highlight that this might be one reason that the respondents did not perceive it as a deterrent. Early in the paper, this finding was not expected, yet it is also highlighted for future research to foreshadow how certain contexts may give rise to patterns or behaviours that may diverge from expected norms.

Although the study proposed that awareness would moderate all links between technological factors and intention to use e-government services, the results show only partial support: awareness moderates the effects of relative advantage and compatibility but not complexity. This should be acknowledged as it indicates that awareness does not consistently strengthen every technology–intention relationship. A likely reason is that awareness alone cannot offset perceptions of system difficulty—especially when interfaces are unintuitive and digital training varies, or complexity is measured more strictly. In such cases, even aware users may still find systems demanding, limiting the moderating role of awareness. Presenting the findings as a conditional rather than universal moderation offers a more accurate theoretical interpretation and more practical insights for Jordanian public universities.

Note: questionnaire can be found her: https://docs.google.com/document/d/1YkFw768MnM-3TUC0cVcgDBPzyZQjqMHh/edit?usp=drivesdk&ouid=113682106684961543854&rtpof=true&sd=true

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