Factors Influencing Citizens' Continuance Intention to Use Government Chatbots: An Empirical Study Based on Diffusion of Innovation Theory

AYMAN ALARABIAT, Al-Balqa Applied University, Jordan
DELFINA SOARES, UNU-EGOV, Portugal

Government chatbots are increasingly deployed to support digital public service delivery, yet their continued value depends on whether citizens with prior experience intend to use them again when a relevant public-service need arises. Drawing on Diffusion of Innovations (DOI) theory, this study examines factors associated with citizens' continuance intention to use government chatbots by integrating five DOI constructs—relative advantage, compatibility, perceived complexity, trialability, and observability—with responsiveness and anthropomorphic design. Data were collected from 358 citizens with prior experience using government chatbots and analyzed using PLS-SEM. Responsiveness showed the strongest association with continuance intention, followed by anthropomorphic design and relative advantage, while perceived complexity was negatively associated. Trialability showed a weaker but statistically significant positive association, whereas compatibility and observability were not significantly associated. The model explains 62.4% of the variance in continuance intention. The findings suggest that reuse intention is more strongly associated with interaction quality and perceived functional benefits than with contextual fit or visibility of outcomes. Continuance intention refers to future-use intention reported by citizens with prior chatbot experience and does not represent observed continued use over time. Theoretically, the study extends DOI to a post-adoption government-chatbot context, while practically highlighting responsiveness and anthropomorphic design.

CCS Concepts: • **Applied computing** → **E-government**;

Additional Key Words and Phrases: Artificial intelligence, chatbot, citizens' continuance intention of use, human–AI interaction, digital government services

ACM Reference Format:
Ayman Alarabiat and Delfina Soares. 2026. Factors Influencing Citizens' Continuance Intention to Use Government Chatbots: An Empirical Study Based on Diffusion of Innovation Theory. *Digit. Gov. Res. Pract.* 7, 4, Article 24 (December 2026), 26 pages. https://doi.org/10.1145/3856816

The research was funded by the Deanship of Scientific Research and Innovation at Al-Balqa Applied University, Jordan, under Award Number DSR-2023#548.

Authors' Contact Information: Ayman Alarabiat (corresponding author), Department of Management Information Systems, Amman College for Financial and Managerial Science, Al-Balqa Applied University, As-Salt, Jordan; e-mail: ayman.arabiat@bau.edu.jo; Delfina Soares, Operating Unit on Policy-Driven Electronic Governance, UNU-EGOV, Guimaraes, Braga, Portugal; e-mail: soares@unu.edu.



This work is licensed under a Creative Commons Attribution 4.0 International License.

© 2026 Copyright held by the owner/author(s).
ACM 2639-0175/2026/12-ART24
https://doi.org/10.1145/3856816

1 Introduction

Today's governments increasingly employ **artificial intelligence** (**AI**) applications to meet citizens' rising expectations and growing demand for efficient and accessible public services [46]. Chatbots are among the AI technologies that have received considerable attention due to their ability to process a large volume of public inquiries, thereby improving public service delivery and enhancing citizen experience [1, 19, 22]. Reflecting this trend, the 2024 United Nations E-Government Survey reports that 78 out of 193 countries have implemented chatbots in their national portals, representing a substantial increase from 50 countries in 2018 [101]. Despite this rapid expansion, the availability and deployment of government chatbots do not necessarily translate into citizens' intention to use them again, and evidence on citizens' post-adoption continuance intention remains limited, particularly in developing countries [1, 4, 22]. This highlights a critical issue: the success of digital government services depends not only on initial adoption but also on whether citizens who have gained direct experience with these systems intend to use them again when a relevant service need arises.

Although research on government chatbot adoption has expanded, most studies focus primarily on initial acceptance and behavioural intention rather than post-adoption continuance [77, 107]. Prior research suggests that determinants of continued use may differ from those influencing initial adoption, as users reassess technologies based on actual experience [36, 52, 75]. However, limited research has examined whether innovation attributes remain associated with citizens' continuance intention after they have gained direct experience with government chatbots. The post-adoption stage, therefore, raises a distinct question: once citizens have interacted with a government chatbot, which characteristics of innovation and of interaction remain relevant to their willingness to use it again? This distinction is important because the long-term value of chatbot technologies cannot be adequately captured through initial acceptance alone. Rather, citizens' willingness to reuse a chatbot when a relevant public-service need arises is important for realising the anticipated benefits of digital government innovations [2, 5].

In this study, the term "continuance intention" refers to the intention of citizens with prior experience of using a government chatbot to use it again in the future. It is important to distinguish this construct from actual continued use: the present study examines citizens' future intention to use government chatbots rather than behaviour observed over time. Accordingly, the study does not use the term "continuance" to imply frequent, permanent, habitual, or exclusive use. Government-service interactions are often need-dependent; therefore, a citizen may report a positive continuance intention even when chatbot use is occasional, provided that the citizen is willing to use the chatbot again when a relevant need arises. To avoid conceptual ambiguity, the term "government chatbots" refers to a broad range of conversational systems deployed by public agencies, including rule-based, semi-automated, and AI-enabled systems, depending on the implementation context. In this study, "use of government chatbots" refers to citizens' active engagement with chatbot systems to perform service-related tasks such as obtaining information, submitting requests, and interacting with government services through conversational interfaces.

From a practical perspective, continued use is essential for realising the full benefits of e-government investments. Without citizens' willingness to reuse available chatbots when appropriate, the potential value of chatbot technologies cannot be fully realised. Prior studies also show that citizens often remain hesitant to replace human interaction with automated systems, which further challenges long-term usage [11, 12, 29]. However, continuance should not be interpreted as encouraging unnecessary interaction with the government. Rather, it concerns citizens' willingness to retain the chatbot as a viable digital channel when they have a genuine need for information or services. Accordingly, greater attention is needed to understand the factors shaping citizens' continuance intention toward government chatbots.

To this end, the study develops and validates a conceptual model grounded in **Diffusion of Innovations** (**DOI**) theory [90]. DOI is relevant to this study because it explains how innovation characteristics shape individuals' evaluations and decisions throughout the innovation process, including the confirmation stage following

experience with an innovation [37, 83, 90]. Previous post-adoption research has demonstrated that innovation attributes can continue to influence technology use beyond the initial adoption stage [82]. At the same time, users may evaluate technologies differently after gaining direct experience, and pre-adoption and post-adoption beliefs are not necessarily identical [52]. Accordingly, this study does not assume that DOI attributes influencing initial adoption necessarily remain relevant after citizens gain direct experience; instead, it examines which selected innovation attributes remain associated with continuance intention after citizens have gained prior experience with government chatbots. The theoretical rationale for applying DOI in this post-adoption context and its distinction from other continuance models are discussed further in Section Three.

Accordingly, this study addresses the following research question: *What factors influence citizens' continuance intention to use government chatbots after gaining prior experience with these systems?* The proposed model integrates the core DOI constructs—relative advantage, perceived complexity, compatibility, trialability, and observability—alongside chatbot-specific factors—namely, responsiveness and anthropomorphic design—to examine their associations with citizens' continuance intention. To address this question, the study uses survey data collected from citizens with prior government-chatbot experience and analyzes the proposed relationships using **partial least squares structural equation modeling** (**PLS-SEM**).

The findings show that responsiveness has the strongest estimated association with continuance intention, while anthropomorphic design, relative advantage, perceived complexity, and trialability also show significant associations. Compatibility and observability are not significantly associated with continuance intention. These findings provide empirical evidence that the relevance of DOI attributes is not uniform in the post-adoption context, with some innovation attributes remaining associated with continuance intention while others are not.

This article is structured as follows: Section two presents a review of recent studies on chatbots in the government context, highlighting key research gaps. Section three describes the theoretical framework, research model, hypotheses, and methodology. The results and discussion are presented in Sections four and five, respectively. Section six discusses the implications, limitations, and future research directions. Finally, Section seven concludes the article.

2 Literature Review

Research on AI in public services has expanded considerably in recent years, yet much of this work has developed within computer science and applied domains such as banking, e-commerce, and service systems, while e-government contexts remain relatively less explored [26, 30, 34, 54]. This imbalance might lead to an uneven understanding of how AI technologies function in public sector environments, particularly from the perspective of citizens [24, 36]. Within e-government, research has increasingly examined the use of chatbot-enabled services from both organisational and citizen perspectives. Organisational studies have addressed institutional readiness, technical integration, and administrative challenges surrounding chatbot deployment in government agencies [23, 24, 44, 47, 66, 67, 70, 100]. Citizen-focused studies, in contrast, have largely examined acceptance and behavioural intention toward government chatbots [1, 3, 75, 78]. Some recent studies have begun to address the citizen perspective by focusing on citizens' acceptance of chatbot-enabled public services. For instance, the **Unified Theory of Acceptance and Use of Technology** (**UTAUT**) based research suggests that performance expectancy, effort expectancy, trust, and social influence are consistently important in shaping behavioural intention toward government chatbots [1, 55]. In a similar direction, **Technology Acceptance Model** (**TAM**)-based studies report that perceived usefulness, ease of use, trust, and social influence remain central predictors of acceptance in public service settings [10, 78]. Taken together, this literature indicates that initial adoption research has primarily examined citizens' cognitive evaluations of usefulness, effort, trust, and social influence before or around the point of adoption.

Beyond these traditional acceptance models, attention has also shifted toward design-related and experiential factors. Research shows that characteristics such as anthropomorphic design, emotional expression, proactivity, and interaction quality can significantly shape users' perceptions of chatbots [45, 51, 60]. A systematic

review of chatbot adoption in local governments found that users' acceptance of chatbot technologies can be influenced by the perceived humanness of the chatbot [94]. In addition, trust, privacy, and cybersecurity have repeatedly emerged as important considerations in the adoption of chatbot-enabled public services [7]. These findings suggest that citizens' evaluations of chatbots involve not only perceived utility but also trust, interaction quality, and experiential characteristics. Nevertheless, the main focus in much of this literature remains on initial intention or acceptance rather than continuance intention following actual experience with the technology [7, 77, 107].

2.1 From Initial Adoption to Continuance Intention

Adoption and continuance represent related but conceptually distinct stages of technology use. Initial adoption concerns whether individuals are willing to accept or begin using technology, whereas post-adoption research examines users who have already gained experience and subsequently form evaluations and intentions concerning future use [36, 52, 75]. More recent evidence reinforces this concern by showing that chatbot adoption should be understood as a process rather than a single decision. A study on government chatbot adoption stages in China highlights that citizens move through different phases, where actual usage behaviour does not always align with initial intention [107]. Longitudinal evidence from Jordan similarly examined the transition from intention to usage behaviour and subsequent satisfaction and continuance intention, showing that post-adoption outcomes can emerge after citizens have gained actual experience with government chatbots [75]. These studies are important because they establish that government-chatbot research cannot be limited to the initial decision to use the technology. At the same time, they leave a more specific question open: once citizens have gained direct experience with a government chatbot, which characteristics of the innovation remain relevant to their willingness to use it again when a relevant public-service need arises? Existing studies provide evidence on initial acceptance and, increasingly, on usage, satisfaction, and continuance outcomes [77, 107]. However, comparatively less attention has been given to whether specific innovation-related characteristics remain associated with continuance intention after users have moved beyond the initial adoption stage.

This distinction is also important for interpreting continuance in the government context. Post-adoption use should not necessarily be understood as frequent, habitual, or permanent use. Government-service interactions are often need-dependent, meaning that citizens may use a chatbot occasionally while still retaining an intention to use it again when a relevant need arises. Thus, continuance intention represents a future-oriented intention following prior experience, whereas actual continued usage requires behavioural observation over time. The present study focuses specifically on continuance intention.[52].

2.2 Research Gap and Theoretical Positioning

Accordingly, the literature reviewed above points to three related observations. First, a substantial portion of government chatbot research remains focused on organisational implementation or on citizens' initial acceptance [1, 3, 23, 24, 44, 55, 78]. Second, emerging studies have increasingly examined actual usage, satisfaction, and continuance outcomes [77, 107]. Third, comparatively limited attention has been given to whether perceptions of specific innovation characteristics remain associated with continuance intention once citizens have gained direct experience with government chatbots. For example, recent longitudinal research in Jordan has examined the transition from intention to actual usage, satisfaction, and future continuance intention within an extended UTAUT2 framework [75]. While this work provides important evidence on broader adoption and post-adoption processes, it does not specifically examine whether core innovation characteristics derived from Diffusion of Innovations theory remain associated with continuance intention following prior experience. This leaves an important theoretical question concerning the continuing relevance of innovation attributes in the post-adoption stage. Similar concerns have been identified in other digital-government domains, where research has tended to emphasise adoption decisions while paying comparatively less attention to post-adoption phases [82].

From a theoretical standpoint, recent reviews confirm that research on chatbots in e-government is still dominated by TAM and UTAUT-based approaches, with behavioural intention as the primary dependent variable [8, 34, 75]. This finding aligns with broader e-government research, which identifies TAM and UTAUT as the dominant theoretical models used to explain citizens' adoption of digital government services [5]. While these approaches provide useful explanations of technology acceptance and use, post-adoption research in information systems has more commonly employed the **Expectation-Confirmation Model** (**ECM**), which explains continuance through post-adoption evaluations such as confirmation, perceived usefulness, and satisfaction [17]. **Unified Theory of Acceptance and Use of Technology 2** (**UTAUT2**), an extension of UTAUT developed to explain technology acceptance and use from the consumer perspective [103] also provides an alternative perspective on continued technology use. These approaches are relevant to continuance research, but they emphasise explanatory mechanisms that differ from the specific focus of the present study. In particular, ECM focuses primarily on post-adoption evaluations, whereas UTAUT2 incorporates broader determinants of technology acceptance and use. The present study instead examines whether perceptions of specific innovation characteristics remain associated with continuance intention after citizens have acquired direct experience with government chatbots.

DOI theory provides a complementary process-oriented perspective for addressing this question. Rather than focusing primarily on confirmation, satisfaction, or broader consumer-use determinants, DOI conceptualises adoption as a process in which individuals form perceptions of innovation characteristics and make decisions across different stages of the innovation process [30, 54, 69]. Recent research has also applied DOI in post-adoption contexts, suggesting that perceptions of innovation characteristics can remain relevant to users' evaluations and behavioural decisions after initial adoption [62, 82]. Accordingly, the present study does not assume that all DOI attributes remain equally important after adoption. Instead, it empirically examines whether five core innovation characteristics—relative advantages, perceived complexity, compatibility, trialability, and observability—remain associated with citizens' continuance intention after they have gained prior experience with government chatbots. This positioning allows the study to examine the continuing relevance of innovation characteristics in the post-adoption context of government chatbots. The specific theoretical rationale for the selected DOI attributes and the proposed relationships is developed in the following section.

3 Theoretical Framework

3.1 DOI

The present study employs the DOI theory as its primary theoretical framework to examine citizens' continuance intention to use government chatbots. DOI explains how an innovation is communicated, evaluated, adopted, and subsequently reassessed over time within a social system, conceptualising diffusion as "the process by which an innovation is communicated through certain channels over time among members of a social system" [90:5]. The theory conceptualises the innovation-decision process as comprising five sequential stages: knowledge, persuasion, decision, implementation, and confirmation. While initial adoption is associated primarily with the decision and implementation stages, the confirmation stage occurs after individuals have gained experience with innovation and reassess their decision based on that experience. This reassessment may reinforce the decision to adopt or lead to discontinuance [90, 91]. Thus, the confirmation stage provides a theoretical basis for examining post-adoption decisions, including whether users intend to continue using an innovation after gaining direct experience with it [37, 83, 90].

The relevance of DOI to the present study lies in its process-oriented perspective on the continued relevance of innovation characteristics beyond the initial adoption decision. Prior research suggests that users' evaluations after gaining direct experience with technology may differ from those formed before adoption, and that the factors associated with post-adoption decisions may therefore differ from those associated with initial adoption [52]. At the same time, innovation attributes do not necessarily lose their relevance after adoption and may

continue to shape users' evaluations and subsequent decisions regarding technology use [62, 82]. Accordingly, this study does not assume that DOI attributes that influence initial adoption necessarily remain influential after experience. Instead, it empirically examines which selected innovation attributes remain associated with continuance intention in a post-adoption government-chatbot context.

3.2 Positioning DOI in Continuance Research

DOI is applied here as a complementary perspective rather than as a conventional continuance-intention model. The ECM, for example, explains continuance primarily through post-adoption cognitive mechanisms, including confirmation, perceived usefulness, satisfaction, and subsequent intention to continue use [17]. In contrast, DOI focuses on the characteristics of innovation itself and how these characteristics shape users' evaluations and behavioural decisions throughout the innovation process [90, 91]. Thus, ECM and DOI address related but conceptually different aspects of post-adoption continuance. ECM is particularly suited to examining how users' post-adoption evaluations, such as confirmation and satisfaction, translate into continuance, whereas the present study examines whether the perceived characteristics of the innovation itself retain explanatory relevance after users have gained direct experience with it.

Other theoretical perspectives could also be relevant. For example, UTAUT2 incorporates behavioural, motivational, and contextual factors such as habit, hedonic motivation, price value, and facilitating conditions that may help explain continued technology use [103]. However, these mechanisms differ from the innovation characteristics examined in the present study. Accordingly, UTAUT2 represents a relevant alternative perspective, but it addresses a different theoretical question from the one examined here.

In summary, the present study does not treat confirmation as an empirical construct measured alongside the DOI attributes. Confirmation is considered here as the post-adoption stage of the DOI innovation-decision process, within which users reassess their experience and may subsequently reinforce or discontinue their use of the innovation [90, 91]. The empirical model instead focuses on the relationships between five core DOI attributes—relative advantage, perceived complexity, compatibility, trialability, and observability—two chatbot-specific characteristics, responsiveness and anthropomorphic design, and citizens' continuance intention. This approach allows the study to examine whether selected innovation and interaction characteristics retain explanatory relevance after citizens have gained prior experience with government chatbots, consistent with the study's objective of examining innovation-related factors associated with continuance intention.

3.3 Government Chatbots in the Jordanian Public Sector

Jordan has been among the countries in the region where chatbots have been introduced in public service delivery [75]. Early implementations began with government services such as the Ministry of Justice chatbot, which enabled citizens to access administrative services through interactive platforms like Facebook Messenger, marking an initial shift toward digital service automation [74]. Building on this foundation, Jordan's e-government framework has incorporated AI chatbots as part of its multi-channel digital service strategy to improve accessibility and service efficiency [6]. Recent national digital transformation initiatives (2026–2028) further emphasise the development of AI-powered unified platforms capable of supporting Arabic natural language processing, voice interaction, and automated service delivery across government institutions [73]. From a policy and infrastructure perspective, digital transformation in Jordan is increasingly recognised as a critical enabler of service efficiency, transparency, and operational performance, requiring strengthened digital infrastructure, human capacity development, and robust regulatory frameworks alongside emerging technologies such as AI, blockchain, and the Internet of Things [72]. In this context, chatbot-enabled services are among the most visible applications of Jordan's digital government agenda.

Recent initiatives have further expanded chatbot deployment through platforms such as "Sanad" and "SanadJo," aiming to provide integrated, citizen-centric digital services across multiple government entities [72].

Despite these developments, evidence indicates heterogeneous levels of maturity and inconsistent implementation of chatbot services across Jordanian public sector domains [73, 75].

Empirical research in the Jordanian context further confirms increasing academic and governmental interest in chatbot adoption across various sectors, including public administration, telecommunications, tourism, and e-commerce, highlighting their growing role in improving operational efficiency and user engagement [49, 80, 95]. However, the available literature and public-sector sources identified in this study do not provide systematic statistics on the number of citizens using government chatbots, the volume of chatbot interactions, or the frequency of citizen use in Jordan. Therefore, the documented deployment of these systems is used here to establish the availability and relevance of chatbot-based public services in the Jordanian context, rather than as evidence of the extent of citizen use. For the present study, prior citizen experience was established at the respondent level through the study's eligibility screening procedure. Specifically, respondents were required to report having used a government chatbot within the previous 6–12 months before proceeding to the main questionnaire. Thus, prior experience with government chatbots was not inferred from the existence or deployment of chatbot services in Jordan; rather, it was based on respondents' self-reported prior use. Despite this growing body of research and practical deployment, comparatively limited attention has been given to post-adoption behaviour and citizens' continuance intention toward chatbot-based services, particularly the integration of innovation attributes with interaction-quality factors to explain post-adoption continuance intention in Arabic e-government contexts, such as Jordan [75]. Accordingly, the Jordanian context provides an appropriate setting for examining continuance intention among citizens who report prior experience with government chatbots, without assuming that deployment statistics represent the broader citizen population.

3.4 Research Model

The proposed research model is grounded in DOI theory and extends it by incorporating chatbot-specific characteristics relevant to AI-enabled public services. Consistent with the theoretical positioning developed above, the model examines whether citizens' evaluations of key innovation attributes remain associated with continuance intention after gaining direct experience with the system. Specifically, the model includes the five core DOI attributes: relative advantage, compatibility, perceived complexity, trialability, and observability. These attributes represent citizens' evaluations of government chatbots in relation to their experiences and expectations of available public service channels, such as face-to-face services, telephone services, and online portals. The model does not assume that all five DOI attributes retain the same relevance after adoption; rather, their relationships with continuance intention are empirically tested in the post-adoption context. Higher perceived relative advantage, compatibility, trialability, and observability are expected to be positively associated with continuance intention, whereas higher perceived complexity is expected to be negatively associated with continuance intention.

To better reflect the unique characteristics of conversational AI systems, the model is extended by incorporating two chatbot-specific factors: responsiveness and anthropomorphic design. Responsiveness refers to the ability of government chatbots to provide timely, accurate, and meaningful responses during interactions, whereas anthropomorphic design refers to users' perceptions of human-like characteristics in the chatbot's appearance, behaviour, and interaction [21, 113]. These factors capture chatbot-specific characteristics relevant to the interaction experience but are not explicitly addressed within the original DOI framework.

Accordingly, the proposed model examines citizens' continuance intention to use government chatbots as a function of both innovation-related evaluations and chatbot-specific interaction characteristics. While the DOI attributes capture perceptions of the innovation itself, responsiveness and anthropomorphic design capture users' perceptions of characteristics experienced through the human–AI interaction. Figure 1 illustrates the proposed research model and the hypothesised relationships among the study constructs. Table 1 presents the operational definitions of the constructs. The development of the study hypotheses is presented in the following section.

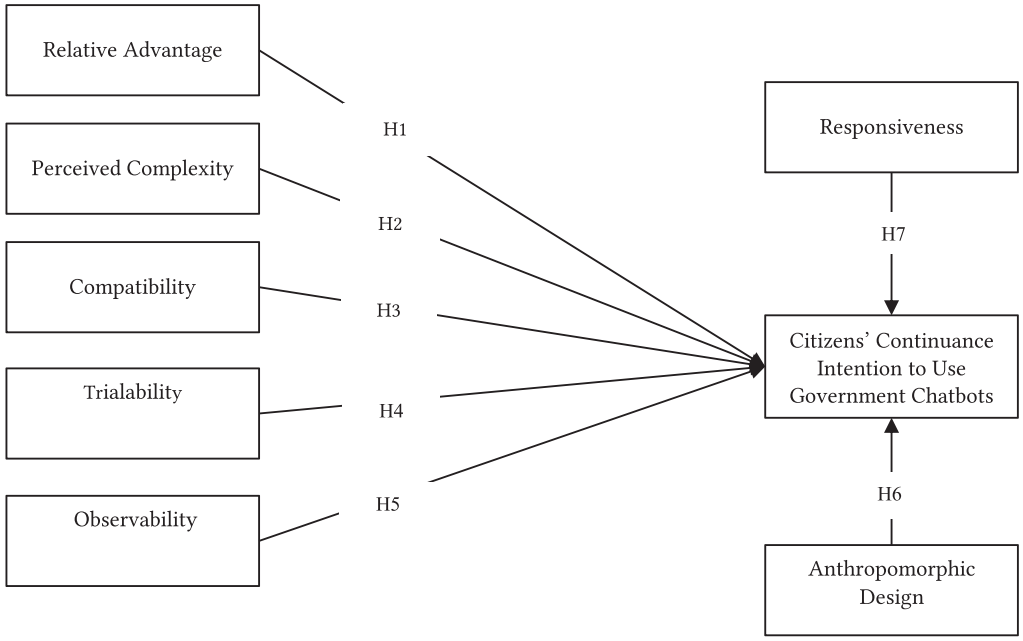

Fig. 1. The research model.

3.5 Research Hypotheses

3.1.1 Relative Advantage. Relative advantage is defined as the degree to which the user perceives that a particular new innovation is better and more beneficial than the existing one [90, 91]. In the post-adoption context, this perception can be reassessed after users have gained direct experience with the technology and may contribute to their intention to use it again. In the context of government chatbots, relative advantage refers to users' overall perceived benefits of using government chatbots compared to traditional service channels. In other words, relative advantage reflects citizens' perceptions that chatbots offer greater convenience, accessibility, efficiency, and effectiveness compared with traditional service delivery channels such as face-to-face interactions, telephone calls, or email communications [15, 65].

Government chatbots may provide convenient access to information and services, reduce wait times or effort, and offer guidance during service interactions, while also serving as an alternative channel that may reduce the need for direct interaction with government employees or physical visits to government offices. When citizens experience these benefits after using the technology, these perceptions may strengthen the chatbot's perceived value and encourage them to consider using it again when a relevant service need arises. Previous studies have consistently demonstrated the positive influence of relative advantage on chatbot adoption and usage across various contexts, including education [8, 14], tourism [42], and insurance services [89]. Furthermore, DOI research suggests that perceived superiority over existing alternatives is particularly important when users can choose among multiple service channels [109]. Since continuance intention may be influenced by users' post-adoption evaluation of the benefits obtained from prior system use [17], citizens who perceive government chatbots as offering superior advantages compared with traditional channels are expected to demonstrate stronger intentions to continue using them. Therefore, the following hypothesis is formulated:

H1. Relative advantage positively influences citizens' continuance intention to use government chatbots.

Table 1. Operationalisation of Variables

Variable	Operational Definition	Adapted From
Relative Advantage	The degree to which government chatbots are perceived as more beneficial than existing service channels, such as phone calls or in-person visits.	[8, 14, 90]
Perceived Complexity	The degree to which using government chatbots is perceived as difficult to understand or use. In the measurement model, this construct is assessed using reverse-coded ease-of-use items, such that higher scores represent higher perceived complexity.	[9, 90, 106]
Compatibility	The degree to which government chatbots are perceived as consistent with citizens' values, prior experiences, needs, and expectations, thereby supporting their willingness to use the technology again.	[14, 71, 90]
Trialability	The degree to which citizens perceive that they can experiment with or try government chatbots with limited commitment when assessing whether to use them again.	[50, 71, 90]
Observability	The degree to which the outcomes and benefits of using government chatbots can be observed and recognised, particularly through the experiences and successful use of the technology by others.	[14, 76, 112]
Responsiveness	The ability of government chatbots to engage in real-time, two-way interactions with citizens by responding promptly, accurately, and effectively to queries.	[38]
Anthropomorphic design	The extent to which government chatbots are perceived to exhibit human-like characteristics, including human-like appearance, natural behaviour, person-like responses, and perceived consciousness during interaction with users.	[31, 64, 88]
Citizens' Continuance Intention to Use Government Chatbots	Citizens' intention to use government chatbots again in the future after having prior experience with the technology	[1, 90, 110]

3.1.2 Perceived Complexity. Perceived complexity is defined as the degree to which using government chatbots is perceived as difficult to understand or use [90]. DOI theory suggests that innovations requiring less effort and fewer new skills are more likely to be accepted and continuously used than complex innovations. In the post-adoption context, lower perceived complexity may support continued use by reducing the effort required to interact with the technology, particularly after users have gained experience with government chatbots. Accordingly, lower perceived complexity reflects users' perceptions that government chatbots are easy to learn, easy to navigate, and require minimal effort to use. When chatbot interfaces are intuitive and interactions are straightforward, users are more likely to experience positive interactions, reducing frustration and increasing their willingness to continue using the system.

Prior research has shown that ease of use positively affects chatbot adoption and usage in healthcare [106], banking [9], tourism [42], and e-commerce environments [13]. Moreover, post-adoption literature indicates that systems perceived as easy to use generate more favourable user experiences, thereby strengthening continuance intentions [17]. From a post-adoption perspective, ease of use can facilitate positive user experiences and encourage willingness to use the technology again. Therefore, citizens who perceive government chatbots as easy to use are more likely to develop stronger continuance intentions. Thus, we hypothesise that:

H2. Perceived complexity negatively influences citizens' continuance intention to use government chatbots.

3.1.3 Compatibility. Compatibility refers to the degree to which an innovation is perceived as being consistent with the needs, prior experiences, and values of potential adopters [90, 91]. DOI suggests that innovation should be adopted more rapidly when it aligns with social system values, beliefs, norms, or practices. In the context of government chatbots, compatibility refers to the extent to which chatbot services align with citizens' communication preferences, prior digital experiences, and expectations regarding public service delivery. When users perceive chatbot services as naturally fitting into their existing routines and service-seeking behaviours, they are more likely to continue using them [28].

Empirical studies have demonstrated the positive influence of compatibility on chatbot adoption in healthcare [56], bank agents' adoption of banking chatbots as customer advisors [9], tourism [42], and online retail environments [13]. Compatibility has also been linked to increased trust in chatbot services [79]. When citizens perceive government chatbot services as compatible with their values, prior experiences, communication preferences, and service needs, they may be more willing to use them again. Accordingly, we hypothesise that compatibility is positively associated with continuance intention. This leads to the following hypothesis:

H3. Compatibility positively influences citizens' continuance intention to use government chatbots

3.1.4 Trialability. Trialability is the extent to which an innovation can be readily tested without requiring any upfront financial outlays or commitments [90, 91]. According to DOI, opportunities to test an innovation reduce uncertainty and allow users to evaluate its value before committing to continued use.

Government chatbots typically offer relatively high trialability because they can often be accessed at no cost or with a short-term commitment. Such opportunities allow citizens to explore chatbot functionality, evaluate service quality, and gain familiarity with the system. Although trialability is traditionally associated with reducing uncertainty before adoption, opportunities to experiment with chatbot functions may remain relevant after initial experience by allowing users to assess the system's suitability for different service needs.

In the present study, trialability is conceptualised as citizens' perceived opportunity to experiment with or try chatbot functionalities with limited commitment when assessing whether to use the system again. Previous studies have found that trialability positively influences technology use. For example, the purchase of virtual reality headsets has risen after people have had the opportunity to try them out [57]. A similar significant impact of trialability was found in using chatbots for tourism purposes [42], on user intention to use mobile health applications [50], on using e-banking services [43] and on sharing mobility applications, such as the Uber mobile application. Thus, trialability can help reduce fears associated with innovation, decrease uncertainty and risks, and increase the likelihood of trial adoption [53]. In a post-adoption context, citizens who perceive that they can freely explore and test chatbot functions may be more willing to reuse the system when a relevant service need arises. Accordingly, we propose that:

H4. Trialability positively influences citizens' continuance intention to use government chatbots

3.1.5 Observability. Observability refers to the degree to which the benefits and outcomes of an innovation are visible and understandable to users and others [90, 91]. DOI suggests that innovations with highly visible benefits are more likely to be accepted and sustained because users can easily recognize their value. In the context of government chatbots, observability reflects the extent to which the outcomes of chatbot use can be noticed, recognised, and understood by users and others. These outcomes may include faster access to information, reduced service delays, greater convenience, and successful completion of government transactions. Importantly, observability does not simply refer to whether users perceive a chatbot as useful; rather, it concerns the extent to which the outcomes associated with chatbot use are visible and recognisable.

In the context of government chatbots, observability refers specifically to the extent to which outcomes and successful experiences associated with chatbot use can be observed and recognised through other users' experiences. Previous studies have identified observability as a significant predictor of technology adoption in tourism [42], healthcare [50], and banking services [43]. However, the role of observability may differ in a continuance context. Once citizens have directly used a government chatbot, they may have greater access to

first-hand information about its outcomes, potentially reducing the additional influence of outcomes observed indirectly through others. Thus, although observable outcomes may reinforce favourable evaluations of a chatbot, whether observability continues to influence citizens' continuance intention after direct experience remains an empirical question.

Accordingly, citizens who perceive successful outcomes and experiences associated with government chatbot use as more observable through other users' experiences are expected to demonstrate stronger continuance intentions. Thus, we propose that:

H5. Observability positively influences citizens' continuance intention to use government chatbots

3.1.6 Anthropomorphic Design of AI Chatbots. Anthropomorphic design refers to the extent to which a chatbot exhibits perceived human-like characteristics in its communication and interaction, including conversational abilities, social cues, empathy, and emotional expressions [88]. These human-like design elements can make interactions feel more natural and socially engaging, thereby enhancing users' overall experience in digital service environments. In the present study, anthropomorphic design refers to the extent to which users perceive the chatbot as exhibiting human-like characteristics in its appearance, behaviour, responses, and perceived consciousness. This conceptualisation corresponds directly to the four measurement items assessing whether government chatbots look human-like, behave naturally, respond like a person, and seem conscious. Anthropomorphic design is conceptually distinct from DOI constructs, as it represents a human–computer interaction design feature that enhances social presence and emotional engagement, rather than an evaluation of the innovation's relative advantage, compatibility, or complexity. Prior research consistently demonstrates that anthropomorphic chatbot features positively influence users' acceptance, trust, perceived usefulness, and intention to use AI systems [58, 63, 81]. In public sector contexts, recent studies confirm that perceived humanness is a key determinant of citizens' acceptance of chatbot technologies [94], while natural dialogue interfaces further enhance usability and trust in digital government services [26].

In e-government environments, anthropomorphic interfaces help reduce perceptions of impersonality and bureaucratic distance by simulating human-like dialogue between citizens and public administration systems [28]. As a result, interactions may become more engaging and socially meaningful, thereby strengthening users' intention to continue using chatbot services. Supporting this view, users generally respond more positively to systems that exhibit human-like conversational behaviour [87, 94]. Similar findings have been reported in healthcare and smart-service environments, where anthropomorphic design enhances acceptance [16, 64].

However, despite these positive effects, the impact of anthropomorphic design in digital government systems remains underexplored and has produced mixed empirical results [75, 96]. In particular, overly human-like design may not always translate into improved user outcomes depending on context and user expectations. This suggests that the relationship between anthropomorphic design and continuance intention should be treated as an empirical question rather than assumed from findings on initial acceptance. Nevertheless, based on prior evidence that perceived human-like characteristics can enhance users' perceptions and experiences with conversational systems, higher perceived anthropomorphic design in government chatbots is expected to strengthen citizens' intention to continue using such systems. Accordingly, we hypothesise that the anthropomorphic design features of government chatbots positively influence citizens' continuance intention to use government chatbot services.

H6. Anthropomorphic design positively influences citizens' continuance intention to use government chatbots.

3.1.7 Responsiveness. Responsiveness refers to a system's ability to provide timely, accurate, and relevant responses during interactions with citizens [86]. Responsiveness is not explicitly represented within the core DOI attributes, as it reflects the quality of the interaction experienced during system use, including timeliness, accuracy, and responsiveness to users' inputs, whereas DOI primarily captures users' evaluations of innovation characteristics. In government chatbot contexts, responsiveness is reflected in reduced response time, continuous

availability, and the ability to provide relevant assistance, all of which can contribute to an enhanced citizen service experience [12, 61, 94]. Although responsiveness may indirectly contribute to perceived relative advantage, it represents a distinct interaction-quality dimension not explicitly captured by core DOI innovation attributes. Whereas DOI attributes describe how users evaluate innovation, responsiveness captures what users experience during the interaction itself.

Prior research consistently highlights responsiveness as a central determinant of user satisfaction and engagement in AI-enabled service environments. Studies show that timely and relevant system responses increase trust, satisfaction, and continued use intention [20, 60, 84, 105]. In e-government contexts, responsive systems reduce waiting time, improve accessibility, and enhance service efficiency, thereby strengthening citizens' reliance on digital government platforms [46]. Recent literature further emphasises that responsiveness is perceived by citizens as a direct indicator of service quality and system usefulness in AI-driven public services [94]. This is particularly important in public administration settings, where users often seek immediate assistance and rapid resolution of service-related issues. Because responsiveness is directly experienced during chatbot interactions, positive experiences with timely, relevant responses may be particularly important in the post-adoption stage, when citizens reassess whether the system is worth using again. Accordingly, citizens who perceive government chatbots as highly responsive are more likely to develop positive service evaluations and stronger continuance intentions. Therefore, responsiveness is expected to have a direct positive effect on continuance intention. Thus, we propose the following hypothesis:

H7. Responsiveness positively influences citizens' continuance intention to use government chatbots

3.6 Research Methodology

This study adopted a positivist paradigm, in which hypotheses were developed and empirically tested using quantitative methods. Data were collected through an online survey questionnaire, which is widely recognised as an efficient and commonly used instrument in contemporary information systems research [111].

The research model comprised seven constructs. Measurement items for the five main DOI constructs (i.e., relative advantage, perceived complexity, compatibility, trialability, and observability) were adopted from [90, 91] and supported by recent related studies from various disciplines, e.g., [14, 42, 108]. It is worth noting that perceived complexity was operationalised and measured using reverse-coded ease-of-use items, where higher scores indicate greater perceived complexity (i.e., greater difficulty of use).

Items for anthropomorphic design and responsiveness were adapted from prior studies in human–AI interaction and chatbot research [18, 48, 94]. The original questionnaire was developed in English and translated into Arabic to ensure clarity and accessibility for respondents, who were native Arabic speakers. The survey was administered exclusively in Arabic. All constructs were measured using a 5-point Likert scale ranging from "strongly disagree" to "strongly agree". To preserve the content of the validated measures, no substantive modifications were made to the original scales, except for minor wording adjustments to improve clarity in the Arabic version. The final set of measurement items and their corresponding sources are listed in Table 2. Data analysis was conducted using the **Statistical Package for Social Sciences** (**SPSS**) and **Partial Least Squares Structural Equation Modelling** (**PLS-SEM**), following established guidelines in the literature [39–41] for hypothesis testing and model evaluation. PLS-SEM was selected because it is well-suited to prediction-oriented research models involving multiple latent constructs and hypothesised relationships.

The anthropomorphic design elements were intended to capture respondents' perceptions of human-like characteristics conveyed through the chatbot interface and interactions. The four items assess perceived human-like appearance, natural behaviour, person-like responses, and perceived consciousness [31, 64, 88].

As the study focuses on post-adoption continuance intention, the dependent construct was operationalised as continuance intention rather than initial adoption. In the Arabic questionnaire, respondents were asked about their intention to use government chatbots again in the future based on their prior experience with such systems, consistent with the post-adoption focus of the study.

Table 2. Study Questionnaire Constructs and Measurements

Variable	Items	Adapted From
Relative Advantage	Government chatbots can find and process the necessary information to complete tasks. Using government chatbots helps me to accomplish tasks more quickly and access government services. Using government chatbots offered me real advantages over contacting a government office in person.	[8, 14, 90]
Perceived Complexity	It is easy for me to use the government chatbots. It is easy for me to know/learn how to use government chatbots. I find that dealing with government chatbots is clear and understandable	[9, 90, 106]
Compatibility	Compared to the effort I need to put in, the usage of government chatbots is worthwhile to me. Using government chatbots is appropriate for my needs. Using government chatbots fits well with the way I like to contact the government for getting services.	[14, 71, 90]
Trialability	I want to use government chatbots on a trial basis to see what they can do for me. I like being able to try out government chatbots before deciding whether I like them or not. Being able to try out government chatbots is important in my decision to adopt/use them.	[50, 71, 90]
Observability	I would feel more encouraged to use government chatbots if I observed others using them. I will use government chatbots when others have had successful experiences using them.	[14, 76, 112]
Responsiveness	Government chatbots understand and handle my questions, commands, problems, and requests very well. Government chatbots respond to my requests fast enough. Government chatbots provide responses to queries as I expect. Government chatbots provide relevant and helpful responses to my requests.	[38]
Anthropomorphic design	Government chatbots look human-like. Government chatbots behave naturally. Government chatbots seem to be responding to me like a person. Government chatbots seem conscious	[31, 64, 88]
Citizens' Continuance Intention to Use Government Chatbots	I intend to continue using government chatbots in the future. I will use government chatbots whenever possible. I am likely to rely on government chatbots for public services in the future.	[1, 90, 110]

Screening and Eligibility. To ensure that the study included only respondents with recent prior experience using government chatbots, a screening question was placed at the beginning of the questionnaire: "Have you used a government chatbot within the previous 6–12 months?" Respondents who selected "Yes" were allowed to proceed to the main questionnaire, whereas respondents who selected "No" were screened out and exited the survey. Thus, eligibility for the study was established through respondents' self-reported prior chatbot use rather than inferred from the deployment of government chatbots in Jordan. In addition to the screening question, respondents were asked: "How would you describe your use of the chatbot during the previous 6–12 months?" Four response categories were provided: Low/Minimal use, Moderate use, High/Frequent use, and very frequent use. This measure provided additional descriptive information about the reported frequency of prior chatbot use.

A non-probability convenience sampling technique was employed to reach eligible respondents. Data were collected between March and April 2025 using social media platforms (primarily Facebook) and personal

Table 3. Sample Profile

		Frequency	Percentage (%)
Gender	Male	170	47.5
	Female	188	52.5
Age	18-20	80	22.3
	21-24	95	26.5
	25-34	48	13.4
	35-40	55	15.4
	41-44	44	12.3
	45-50	26	7.3
	More than 50	10	2.8
Education	Bachelor	300	83.8
	Master	28	7.8
	PhD	30	8.4
Frequency of government chatbots use	Low/Minimal use	53	14.8
	Moderate use	194	54.2
	High/Frequent use	51	14.2
	Very frequent use	60	16.8

networks, employing a snowball sampling approach. This approach was adopted due to the absence of an official sampling frame for government chatbot users in Jordan and the difficulty of identifying a comprehensive population of citizens with prior experience using government chatbots. A total of 358 valid responses were obtained. Given that the study targeted a specific subgroup—citizens with prior experience using government chatbots—the final sample of 358 valid responses exceeded the minimum sample-size threshold indicated by the ten-times rule [35, 99]. Ethical considerations were strictly followed. Participation was voluntary and anonymous, and no personal identifiers were collected. Data were used exclusively for academic purposes. Table 3 presents the demographic profile of respondents.

The sample profile indicates that female participants (52.5%) slightly surpassed the percentage of male participants (47.5%). The largest group of respondents was aged 21 to 24 years (26.5%), followed by the 18 to 20 years age group (22.3%). Regarding education, all participants held at least a bachelor's degree, with the majority holding a bachelor's degree (83.8%), and smaller proportions holding a master's (7.8%) or a PhD (8.4%) degree. Concerning the frequency of using government chatbots, approximately 31.0% reported high or very frequent use, while 54.2% indicated moderate use. Only 14.8% reported low or minimal use. These results provide additional descriptive information about the extent of respondents' prior interaction with government chatbots, while the screening criterion ensured that all included respondents reported prior experience with the technology.

4 Results

4.1 Measurement Model

To assess the reliability and validity of the measurement model, indicator reliability, internal consistency reliability, convergent validity, and discriminant validity were examined. Indicator reliability was assessed using factor loadings. Most indicators exceeded the recommended threshold of 0.708, while one indicator had loadings below this threshold but remained above 0.50. Such indicators can be retained when supported by satisfactory levels of construct reliability and convergent validity [40]. Given the satisfactory values of composite reliability and **average variance extracted** (**AVE**), the indicators were retained. Internal consistency reliability was evaluated

Table 4. Reliability and Convergent Validity Results

Construct	Items	Factor Loading	CR	AVE	Alpha
	Relative Advantage1	.915	0.938	0.834	0.927
Relative Advantage	Relative Advantage2	.958			
	Relative Advantage3	.865			
Perceived Complexity	Perceived Complexity1	.877	0.947	0.865	0.910
	Perceived Complexity2	.959			
	Perceived Complexity3	.938			
Compatibility	Compatibility1	.754	0.799	0.571	0.787
	Compatibility2	.676			
	Compatibility3	.829			
Trialability	Trialability 1	.740	0.865	0.688	0.839
	Trialability 2	.868			
	Trialability3	.874			
Observability	Observability 1	.857	0.846	0.734	0.821
	Observability 2	.856			
Responsiveness	Responsiveness1	.761	0.872	0.578	0.884
	Responsiveness2	.728			
	Responsiveness3	.753			
	Responsiveness4	.728			
Anthropomorphic design	Anthropomorphic design1	.779	0.843	0.573	0.884
	Anthropomorphic design2	.717			
	Anthropomorphic design3	.717			
	Anthropomorphic design4	.811			
Citizens' Continuance Intention to Use Government Chatbots	Citizens' Continuance Intention to Use Government Chatbots 1	.874	0.897	0.744	0.853
	Citizens' Continuance Intention to Use Government Chatbots2	.820			
	Citizens' Continuance Intention to Use Government Chatbots3	.892			

using Cronbach's alpha and **composite reliability** (**CR**). All constructs exceeded the recommended threshold of 0.70 for composite reliability, indicating satisfactory internal consistency. Convergent validity was assessed using AVE, and all constructs achieved values above the recommended threshold of 0.50 [32, 40], confirming adequate convergence of the measurement items. The results presented in Table 4 indicate satisfactory levels of internal consistency, reliability, and convergent validity, while most indicators also demonstrate satisfactory indicator reliability.

Discriminant validity was examined using the Fornell–Larcker criterion [32]. As shown in Table 5, the square root of AVE for each construct exceeded its correlations with other constructs, indicating adequate discriminant validity. Finally, model fit was assessed using SRMR and CFI. The obtained values (SRMR = 0.059; CFI = 0.87) indicate an acceptable SRMR value, whereas the CFI falls below the commonly referenced 0.90 benchmark. Given the use of PLS-SEM, these fit indices were considered alongside the measurement and structural model assessments rather than as the sole basis for evaluating model quality. Overall, the results presented in Tables 4 and 5 indicate that the measurement model demonstrates satisfactory levels of reliability, convergent validity, and discriminant validity, supporting its suitability for testing the structural model.

Table 5. Descriptive Analysis and Discriminant Validity

	M	SD	1	2	3	4	5	6	7	8
1	4.35	1.04	**.913**							
2	4.29	1.00	0.516	**0.930**						
3	2.30	1.25	0.392	0.637	**0.756**					
4	2.50	1.26	0.296	0.613	0.583	**0.830**				
5	2.35	1.27	0.182	0.503	0.419	0.507	**0.857**			
6	4.19	1.09	0.384	0.608	0.529	0.568	0.431	**0.760**		
7	4.11	1.09	0.359	0.554	0.423	0.462	0.325	0.634	**0.757**	
8	4.23	1.28	0.214	0.514	0.402	0.473	0.371	0.596	0.618	**0.863**

Notes: (1) Relative Advantage, (2) Perceived Complexity, (3) Compatibility, (4) Trialability, (5) Observability, (6) Responsiveness, (7) Anthropomorphic Design, (8) Citizens' Continuance Intention to Use Government Chatbots. M= Mean, SD= Standard Deviation. Diagonal values represent the square roots of AVE; off-diagonal values are the estimates of intercorrelation between the latent constructs.

Table 6. Hypotheses Testing Results

Hypothesis	Beta (β^)	P-value	Conclusion
H1: Relative advantage → Continuance Intention	0.176**	0.003	**Supported**
H2: Perceived complexity → Continuance Intention	**-0.165***	0.016	**Supported**
H3: Compatibility→ Continuance Intention	0.020	0.697	Not supported
H4: Trialability→ Continuance Intention	**0.052***	0.017	**Supported**
H5: Observability→ Continuance Intention	0.027	0.185	Not supported
H6: Anthropomorphic design → Continuance Intention	**0.255*****	0.001	**Supported**
H7: Responsiveness→ Continuance Intention	**0.550*****	0.001	**Supported**

Significant at $p \leq 0.05$; ** Significant at $p \leq 0.01$; *** Significant at $p \leq 0.001$.

4.2 Structural Model

The results of the path model and hypotheses testing are shown in Table 6 and Figure 2. The structural model explained 62.4% of the variance in continuance intention ($R^2 = 0.624$), indicating moderate-to-substantial explanatory power (Hair et al., 2019). The path analysis revealed that hypotheses H1, H2, H4, H6, and H7 were supported, whereas H3 and H5 were not. As shown in Table 6 and Figure 2 responsiveness had the strongest positive effect on citizens' continuance intention to use government chatbots ($\beta = 0.550$; $p = 0.001$), followed by anthropomorphic design of government chatbots ($\beta = 0.255$; $p = 0.001$), relative advantage ($\beta = 0.176$; $p = 0.003$), and perceived complexity ($\beta = -0.165$; $p = 0.016$), thereby supporting hypotheses H7, H6, H1, and H2. Trialability also showed a statistically significant positive association with continuance intention, although the magnitude of the coefficient was small ($\beta = 0.052$; $p = 0.017$), supporting hypothesis H4. Compatibility and observability were not significantly associated with continuance intention ($\beta = 0.020$; $p = 0.697$ and $\beta = 0.027$; $p = 0.185$, respectively), and therefore H3 and H5 were not supported.

5 Discussion

The results show that responsiveness, anthropomorphic design, relative advantage, and perceived complexity were significantly associated with citizens' continuance intention. These findings are consistent with prior research highlighting the importance of system characteristics and perceived benefits in influencing user adoption and continuance behaviour in AI-enabled service environments [16, 58, 63, 64, 81, 94].

Responsiveness emerged as the strongest predictor of citizens' continuance intention to use government chatbots, indicating that timely, accurate, and relevant responses were significantly associated with stronger

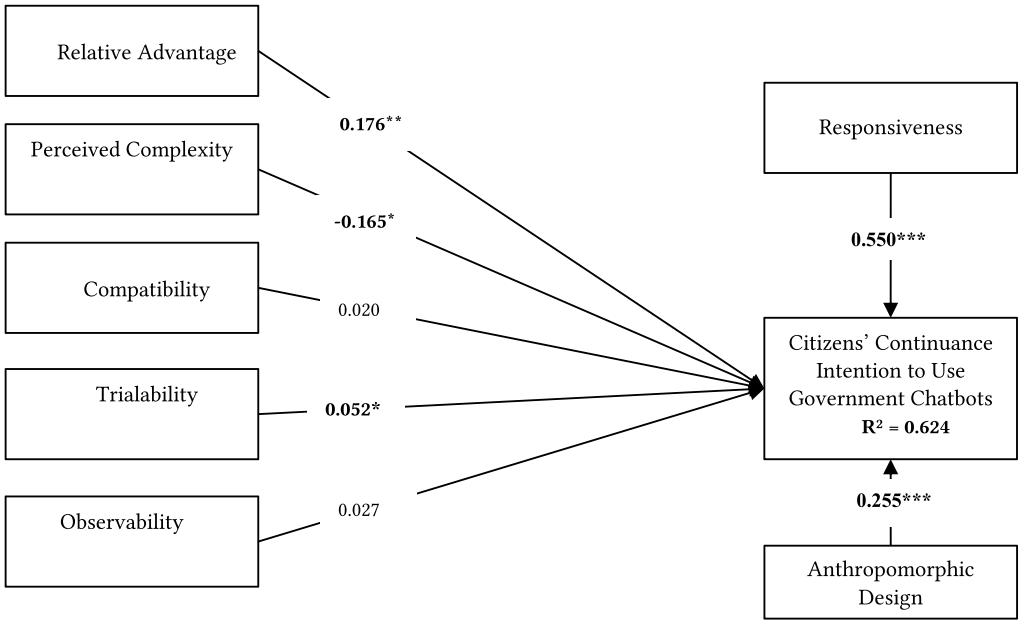

Fig. 2. Results of the structural model analysis.

continuance intention. This finding is consistent with prior studies emphasising responsiveness as a core determinant of continued engagement in AI-based service systems [20, 84, 105]. In e-government contexts, responsiveness enhances perceived service efficiency by reducing waiting time and improving the speed and relevance of information delivery, while enabling dynamic two-way interactions, which in turn may strengthen citizens' continued use of digital government platforms [46]. When government chatbots are able to support dynamic and interactive exchanges, citizens perceive higher service quality and are more likely to continue using them [46, 86, 105]. Accordingly, responsiveness should not be viewed solely as a technical attribute, but rather as a key dimension of perceived service quality that directly shapes continuance intention [12, 105]. This finding is consistent with recent reviews of e-government conversational systems, which identify reduced response time, service efficiency, and continuous service availability as core objectives and benefits of government chatbot implementation [28].

Anthropomorphic design was significantly associated with citizens' continuance intention to use government chatbots, suggesting that human-like features may contribute to perceived interaction quality and may support citizen engagement in public sector digital services [98]. In the present study, this finding suggests that when citizens perceive a government chatbot as more human-like in its appearance, identity, communication, or interaction, they may be more inclined to use it again when a relevant public service need arises. The study result aligns with previous research showing that anthropomorphic chatbot design increases perceived social presence, trust, and acceptance [48, 63, 81]. This result is also consistent with [94], who identify perceived humanness as an important determinant of chatbot acceptance in local government contexts. By introducing human-like cues, chatbots may reduce psychological distance between users and systems, thereby improving the interaction experience and potentially encouraging continued use [64, 88]. In a post-adoption context, these human-like characteristics may help maintain a more natural and socially engaging interaction experience, which may strengthen citizens' intention to consider government chatbots as a potential channel for future service needs.

Relative advantage and perceived complexity were also found to be significantly associated with citizens' continuance intention, with relative advantage having a positive effect and perceived complexity having a negative

effect, thereby reinforcing the relevance of selected DOI attributes in examining post-adoption continuance intention. Specifically, innovations perceived to deliver substantial benefits and to be easier to interact with may be more likely not only to gain user acceptance but also to be considered for future use after citizens have gained prior experience. These results are also consistent with prior studies indicating that perceived usefulness and ease of use are important predictors of chatbot adoption and continuance across e-government as well as e-commerce [8, 13, 42]. Citizens continue using government chatbots when they perceive them as more efficient and accessible than traditional service channels [28].

Trialability showed a weaker but significant effect on citizens' continuance intention. This finding is consistent with DOI theory, which suggests that the ability to experiment with an innovation reduces uncertainty and enhances adoption decisions [90]. Previous research also supports this relationship in contexts such as mobile applications, tourism services, and healthcare technologies [43, 50, 57]. The finding in the present study is noteworthy because trialability is traditionally associated with reducing uncertainty before adoption, whereas the current results indicate that this attribute remained statistically associated with continuance intention among respondents who had already gained prior experience with government chatbots. The statistically significant association with trialability is noteworthy because it suggests that an attribute traditionally discussed in relation to pre-adoption uncertainty may retain some relevance after users have gained prior experience, although its relatively small coefficient indicates a weaker association than the other significant predictors, such as responsiveness and anthropomorphic design.

Compatibility and observability were not significant predictors of citizens' continuance intention. These findings suggest that not all DOI attributes necessarily retain the same explanatory relevance after users have gained direct experience with an innovation. In a continuance context, citizens may place greater emphasis on characteristics experienced during actual interaction, such as responsiveness and perceived benefits, while the additional relevance of compatibility or others' observed experiences may be more limited.

The non-significant effect of compatibility could be related to the task-oriented nature of government chatbot interactions, where users focus on problem-solving and efficient service completion rather than behavioural alignment [66].

This interpretation is further supported by [28], who describe government chatbots as predominantly QA-based and information-provision systems, in which citizens interact mainly to obtain specific services or information. Once citizens have gained direct experience with a chatbot, therefore, compatibility with prior communication preferences or practices may become less salient than the actual benefits and quality of the interaction. This interpretation remains tentative, however, because the present study did not directly measure users' task orientation or reliance on alternative communication channels.

Similarly, the non-significant effect of observability may be partly related to the nature of government chatbot use and the limited role of observing other users' experiences in individual service interactions. Citizens typically interact with government chatbots in task-specific contexts, which may limit opportunities to observe others' usage behaviour or outcomes [33, 92]. This interpretation is particularly relevant because the observability measure in this study focuses on citizens' willingness to use government chatbots based on observing other users' successful experiences. Once citizens have directly used a government chatbot, they may have greater access to first-hand information about its outcomes, potentially reducing the additional influence of experiences observed indirectly through others. Nevertheless, this interpretation should be regarded as a possible explanation rather than an established mechanism.

Empirical evidence further supports the context-dependent nature of DOI attributes. For instance, prior research in tourism and travel services shows that compatibility and observability may have context-dependent effects on adoption when misalignment with existing practices exists [42]. This suggests that DOI effects are context-sensitive rather than universally positive. In addition, compatibility and relative advantage are conceptually and empirically interrelated, often exhibiting strong correlations across innovation contexts [85]. Accordingly, the stronger association observed for relative advantage may partly account for the limited unique

contribution of compatibility in the present model. However, this possibility should be interpreted cautiously because the present study did not test mediation or competing explanatory pathways between these constructs.

Finally, observability may influence continuance intention indirectly rather than directly. While observing benefits can increase awareness of system value, such observations are likely to strengthen perceptions of relative advantage and usefulness, which subsequently drive continuance intention. However, this indirect pathway was not tested in the present study and therefore remains a potential explanation for future research rather than an established mechanism. This is consistent with a recent study finding that many government chatbot interactions occur in private, service-oriented contexts, potentially limiting direct visibility effects [28].

Overall, the findings provide a differentiated view of the continued relevance of DOI attributes after prior experience with government chatbots. Relative advantage and perceived complexity remained significantly associated with continuance intention, while trialability showed a statistically significant but small association. In contrast, compatibility and observability were not significantly associated with continuance intention. These findings therefore support the study's theoretical position that the influence of DOI attributes should be empirically examined in post-adoption contexts rather than assumed to persist uniformly from initial adoption.

6 Research Implications, Limitations, and Opportunities

6.1 Implications for Research and Practice

This study contributes to the emerging stream by examining continuance intention toward government chatbots, an area that has received less attention compared to initial adoption studies [1, 3, 78]. Prior research on government chatbot adoption has commonly drawn on technology acceptance models such as UTAUT and TAM, which are valuable for explaining perceptions of usefulness, ease of use, and behavioural intention in technology acceptance contexts [38, 97]. However, these perspectives place less emphasis on whether the characteristics of the innovation itself remain relevant after users have gained direct experience with technology. In contrast, DOI theory provides an innovation-centred perspective by examining how perceived characteristics of an innovation shape users' evaluations and behavioural decisions across the diffusion process [90, 91]. Accordingly, the present study uses DOI as a complementary perspective to examine whether selected innovation attributes—relative advantage, compatibility, perceived complexity, trialability, and observability—remain associated with continuance intention after citizens have gained prior experience with government chatbots. This positioning responds to the study's central question without assuming that DOI attributes associated with initial adoption necessarily retain the same relevance in post-adoption contexts.

Importantly, ECM provides an established perspective for explaining continuance intention through post-adoption mechanisms such as confirmation, perceived usefulness, and satisfaction [17]. DOI addresses a related but distinct aspect by focusing on the perceived characteristics of the innovation itself. Thus, the two perspectives are complementary: ECM primarily explains continuance through users' post-adoption evaluations, whereas DOI enables examination of whether innovation characteristics remain associated with continuance after direct experience. The present study, therefore, does not position DOI as a substitute for established continuance models but rather examines its potential contribution to understanding the continued relevance of innovation attributes in a government-chatbot context.

From a theoretical perspective, the findings provide a more differentiated view of the relevance of innovation characteristics after prior experience. Relative advantage and perceived complexity were significantly associated with continuance intention, while trialability showed a statistically significant but relatively small association. In contrast, compatibility and observability were not significantly associated with continuance intention. This pattern suggests that selected DOI attributes may retain relevance after prior experience, but their association with continuance intention is not uniform across attributes. The findings, therefore, extend the application of DOI to a post-adoption government-chatbot context by empirically examining, rather than assuming, which innovation characteristics remain relevant after users have gained direct experience. In addition, the significant

associations of responsiveness and anthropomorphic design highlight the relevance of chatbot-specific interaction characteristics alongside established innovation attributes.

From a practical perspective, the findings offer several implications for government agencies and system designers, particularly for public-sector agencies involved in digital service delivery, including Jordan's Ministry of Digital Economy and Entrepreneurship, in improving chatbot-enabled citizen services. Responsiveness showed the strongest estimated association with continuance intention; accordingly, government agencies and chatbot designers may consider prioritising timely, accurate, and context-relevant responses. Additionally, anthropomorphic design features—such as natural conversational behaviour, person-like responses, and other human-like interaction cues—may contribute to user engagement and reduce psychological distance between citizens and digital services. The results also highlight the importance of relative advantage, suggesting that government entities should clearly communicate the benefits of chatbot use, including convenience, time efficiency, and 24/7 availability. Moreover, minimising system complexity is important for reducing the effort required to interact with government chatbots, particularly for users with varying levels of digital experience.

The non-significant association between compatibility and continuance intention indicates that citizens' alignment with prior communication practices was not significantly associated with continuance intention in this sample. This finding does not imply that compatibility is unimportant in all government chatbot contexts; rather, its contribution may be less pronounced after citizens have gained direct experience with the system. To address situations in which automated interaction does not adequately meet users' needs, hybrid service models incorporating human-in-the-loop support may also provide a useful complementary approach, allowing escalation to human agents when necessary.

6.2 Limitations and Future Research

Despite its contributions, this study has several limitations that open avenues for future research.

First, the study adopts a cross-sectional design, which captures citizens' perceptions at a single point in time. Future research could employ longitudinal designs to better understand how continuance intention evolves over time as users gain more experience with government chatbots and as the technology itself matures.

Second, the study is limited to a single national context (Jordan). While this provides valuable insights into an emerging digital government environment, the findings may not be fully generalizable to other countries with different cultural, technological, and institutional settings. Future studies are encouraged to conduct cross-country comparisons to examine how national culture and digital infrastructure influence continuance behaviour. Further, the use of convenience and snowball sampling may also limit the generalizability of findings.

Third, the sample is skewed toward younger and highly educated users. Although the study provides evidence on citizens with prior chatbot experience, the sample composition limits the extent to which the findings can be generalised to older citizens and populations with different levels of education or digital experience. Future research should specifically examine elderly citizens, rural populations, and individuals with limited digital experience to better assess the inclusiveness and accessibility of government chatbots.

Fourth, this study focuses on DOI-based innovation attributes and two interaction-quality factors — responsiveness and anthropomorphic design. However, psychological and trust-related constructs such as trust in government, perceived risk, satisfaction, and transparency were not included. Future research could integrate DOI with trust-based and cognitive models to provide a more comprehensive explanation of continuance intention and to examine whether post-adoption evaluations, such as satisfaction or confirmation, mediate the relationships between innovation characteristics and continuance intention.

Finally, future research should explore emerging chatbot-enabled government service capabilities, including generative AI, multimodal interfaces, and voice-based chatbot systems, to better understand their implications for long-term citizen engagement. Future studies could also compare citizens with different levels of prior experience and examine whether the relative importance of DOI attributes changes as users accumulate greater experience with chatbot-enabled government services. In addition, future research may examine non-adopters'

perspectives to identify barriers to initial adoption and compare them with continuance users to develop a more complete understanding of chatbot acceptance and continued use in public services.

7 Conclusion

This study focuses on citizens' continuance intention to use government chatbots, rather than on initial adoption or acceptance, to capture post-experience evaluations based on prior interaction with the system. An extended research model grounded in DOI theory was developed and empirically examined by integrating core innovation attributes with chatbot interaction-related characteristics. The findings support the view that continuance intention should be understood as a dynamic evaluative process rather than a single decision at the point of initial adoption. After gaining experience with chatbot services and drawing on their prior interactions, users reassess their evaluations, which in turn shape their intention to continue using these services. This highlights the importance of post-experience evaluations in understanding continuance intention, rather than implying that initial expectations alone determine continued use. Overall, the results indicate that continuance intention is primarily associated with interaction quality and perceived value. In particular, system responsiveness and anthropomorphic design, together with perceived relative advantage and lower perceived complexity, play a central role in shaping users' intentions to continue using government chatbots.

From a theoretical perspective, the study demonstrates that several DOI attributes are associated with post-adoption continuance intention in the context of government chatbots. It also highlights that the relevance of innovation attributes may vary across stages of technology use, where certain attributes, such as compatibility and observability, were not significantly associated with continuance intention in the present study.

From a practical perspective, the findings suggest that government agencies should prioritise improving the quality of interaction in chatbot services, particularly through enhancing responsiveness and incorporating human-like communication features. In addition, clearly communicating the benefits of chatbot services and simplifying chatbot interactions can further support sustained citizen engagement. The results also indicate that integrating human support with chatbot-based services may improve accessibility and better accommodate diverse citizen needs. Overall, the study contributes to the e-government and digital service literature by providing evidence that sustained use intentions in government chatbot contexts are associated with post-experience interaction quality and perceived service value, while pre-use expectations and contextual alignment factors may not fully account for continuance intention.

Acknowledgments We sincerely thank the Editor-in-Chief and reviewers of *Digital Government: Research and Practice* for their valuable comments and suggestions. We also thank Naci Karkin, UNU-EGOV, for his valuable assistance during the second round of revision.

References

[1] Nadia Abbas, Asbjørn Følstad, and Cato A. Bjørkli. 2023. Chatbots as part of digital government service provision–a user perspective. In *Proceedings of the International Workshop on Chatbot Research and Design*. Springer, 66–82.

[2] Noor Fareen Abdul Rahim, Ghazanfar Ali Abbasi, Mohammad Iranmanesh, Nwakaji Christopher, and Azlan Amran. 2023. Determinants of continuous intention to use e-government services: an extension of technology continuance theory. *Journal of Systems and Information Technology* 25, 3 (2023), 245–267.

[3] S. S. Abed. 2024. Understanding the determinants of using government AI-chatbots by citizens in Saudi Arabia. *International Journal of Electronic Government Research* 20, 1 (2024), 1–20. DOI: https://doi.org/10.4018/IJEGR.349733

[4] Adnan Sayed Mahmood, Allam Hamdan, and Bahaaeddin Alareeni. 2021. Artificial intelligence for public sector: Chatbots as a customer service representative. In *Proceedings of the Importance of New Technologies and Entrepreneurship in Business Development: In the Context of Economic Diversity in Developing Countries*. Springer International Publishing, Cham, 164–173.

[5] Noura Aleisa. 2024. Key factors influencing the e-government adoption: A systematic literature review. *Journal of Innovative Digital Transformation* 1, 1 (2024), 14–31.

[6] Mohammad A. Alia and Yousef Jaradat. 2025. The foundations and infrastructure required for digital transformation in the jordanian public sector. In *Proceedings of the 2025 10th International Conference on Computer Science and Engineering*. IEEE, 1432–1437.

[7] Ahmed Alqahtani, Jun Yan, Elena Vlahu-Gjorgievska, and Cong Cao. 2026. Factors influencing citizens' adoption of AI-enabled public services in Saudi Arabia: The role of cybersecurity, privacy, and trust. *Digital Government: Research and Practice* 7, 2 (2026), 1–24.

[8] Abdulla Alsharhan, Mostafa Al-Emran, and Khaled Shaalan. 2024. Chatbot adoption: A multiperspective systematic review and future research agenda. *IEEE Transactions on Engineering Management* 71, (2024), 10232–10244. DOI: https://doi.org/10.1109/TEM.2023.3298360

[9] Mónika-Anetta Alt, Ibolya Vizeli, and Zsuzsa Săplăcan. 2021. Banking with a chatbot–A study on technology acceptance. *Studia Universitatis Babes-Bolyai Oeconomica* 66, 1 (2021), 13–35.

[10] S. Alzebda and M. A. I. Matar. 2025. Factors affecting citizen intention toward AI acceptance and adoption: the moderating role of government regulations. *Competitiveness Review* 35, 2 (2025), 434–455. DOI: https://doi.org/10.1108/CR-06-2023-0144

[11] Armenia Androniceanu. 2023. The new trends of digital transformation and artificial intelligence in public administration. *Revista» Administratie si Management Public ń(RAMP)* 40 (2023), 147–155.

[12] Aggeliki Androutsopoulou, Nikos Karacapilidis, Euripidis Loukis, and Yannis Charalabidis. 2019. Transforming the communication between citizens and government through AI-guided chatbots. *Government Information Quarterly* 36, 2 (2019), 358–367. DOI: https://doi.org/10.1016/j.giq.2018.10.001

[13] Tiago Araújo and Beatriz Casais. 2020. Customer acceptance of shopping-assistant chatbots. In *Proceedings of the Marketing and Smart Technologies*. Springer Singapore, Singapore, 278–287.

[14] Musa Adekunle Ayanwale and Mdutshekelwa Ndlovu. 2024. Investigating factors of students' behavioral intentions to adopt chatbot technologies in higher education: Perspective from expanded diffusion theory of innovation. *Computers in Human Behavior Reports* 14, (2024), 100396. DOI: https://doi.org/https://doi.org/10.1016/j.chbr.2024.100396

[15] Raquel Benbunan-Fich, Kevin C. Desouza, and Kim Normann Andersen. 2020. IT-enabled innovation in the public sector: introduction to the special issue. *European Journal of Information Systems* 29, 4 (2020), 323–328. DOI: https://doi.org/10.1080/0960085X.2020.1814989

[16] Maria Camila Bermeo-Giraldo, Orfa Nidia Patiño Toro, Alejandro Valencia Arias, and Paula Andrea Rodríguez Correa. 2023. Factors influencing the adoption of chatbots by healthcare users. *Journal of Innovation Management* 11, 3 (2023), 75–94.

[17] Anol Bhattacherjee. 2001. Understanding information systems continuance: An expectation-confirmation model. *MIS Quarterly* 25, 3 (2001), 351–370.

[18] Mark Anthony Camilleri and Ciro Troise. 2023. Live support by chatbots with artificial intelligence: A future research agenda. *Service Business* 17, 1 (2023), 61–80.

[19] Sheshadri Chatterjee, Sangeeta Khorana, and Hatice Kizgin. 2022. Harnessing the potential of artificial intelligence to foster citizens' satisfaction: An empirical study on India. *Government Information Quarterly* 39, 4 (2022), 101621. DOI: https://doi.org/https://doi.org/10.1016/j.giq.2021.101621

[20] Ja-Shen Chen, Tran-Thien-Y Le, and Devina Florence. 2021. Usability and responsiveness of artificial intelligence chatbot on online customer experience in e-retailing. *International Journal of Retail and Distribution Management* 49, 11 (2021), 1512–1531.

[21] Jiahao Chen, Fu Guo, Zenggen Ren, Mingming Li, and Jaap Ham. 2024. Effects of anthropomorphic design cues of chatbots on users' perception and visual behaviors. *International Journal of Human–Computer Interaction* 40, 14 (2024), 3636–3654. DOI: https://doi.org/10.1080/10447318.2023.2193514

[22] Tao Chen, Wenshan Guo, Xian Gao, and Zhehao Liang. 2021. AI-based self-service technology in public service delivery: User experience and influencing factors. *Government Information Quarterly* 38, 4 (2021), 101520. DOI: https://doi.org/https://doi.org/10.1016/j.giq.2020.101520

[23] Tzuhao Chen, Mila Gascó-Hernandez, and Marc Esteve. 2024. The adoption and implementation of artificial intelligence chatbots in public organizations: Evidence from U.S. state governments. *The American Review of Public Administration* 54, 3 (2024), 255–270. DOI: https://doi.org/10.1177/02750740231200522

[24] Seongkyung Cho, Joon-Young Hur, and Danee Kim. 2025. Bridging trust in AI and its adoption: The role of organizational support in AI chatbot implementation in korean government agencies. *Government Information Quarterly* 42, 4 (2025), 102081.

[25] Samia Cornelius and Dorothy Leidner. 2021. Acceptance of anthropomorphic technology: A literature review. In *Proceedings of the Hawaii International Conference on System Sciences*. Virtual Venue, 6422–6431.

[26] María E. Cortés-Cediel, Andrés Segura-Tinoco, Iván Cantador, and Manuel Pedro Rodríguez Bolívar. 2023. Trends and challenges of e-government chatbots: Advances in exploring open government data and citizen participation content. *Government Information Quarterly* 40, 4 (2023), 101877.

[27] Fred D. Davis. 1989. Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly* 13, 3 (1989), 319–340.

[28] Pedro Henrique Diniz, Luis Paulo Reis, and Henrique Lopes Cardoso. 2025. E-Government systems to improve citizen-to-public administration communication: A literature review. *Digital Government: Research and Practice* 6, 4 (2025), 1–26.

[29] Richard Michael Dreyling, Tanel Tammet, and Ingrid Pappel. 2022. Artificial intelligence use in e-government services: A systematic interdisciplinary literature review. In *Proceedings of the Future Data and Security Engineering. Big Data, Security and Privacy, Smart City and Industry 4.0 Applications*. Springer Nature Singapore, Singapore, 547–559.

[30] Yogesh K. Dwivedi, Laurie Hughes, Elvira Ismagilova, Gert Aarts, Crispin Coombs, Tom Crick, Yanqing Duan, Rohita Dwivedi, John Edwards, and Aled Eirug. 2021. Artificial Intelligence (AI): Multidisciplinary perspectives on emerging challenges, opportunities, and agenda for research, practice and policy. *International Journal of Information Management* 57, (2021), 101994.

[31] Nicholas Epley, Adam Waytz, and John T. Cacioppo. 2007. On seeing human: a three-factor theory of anthropomorphism. *Psychological Review* 114, 4 (2007), 864.

[32] Claes Fornell and David F. Larcker. 1981. Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research* 18, 1 (1981), 39–50.

[33] Dongfang Gaozhao, James E. Wright, and Mylah K. Gainey. 2024. Bureaucrat or artificial intelligence: people's preferences and perceptions of government service. *Public Management Review* 26, 6 (2024), 1498–1525.

[34] Paraskevi Gatzioufa and Vaggelis Saprikis. 2022. A literature review on users' behavioral intention toward chatbots' adoption. *Applied Computing and Informatics* 22, 1–2 (2022), 78–91. DOI: https://doi.org/10.1108/ACI-01-2022-0021

[35] David Gefen and Detmar Straub. 2005. A practical guide to factorial validity using PLS-Graph: Tutorial and annotated example. *Communications of the Association for Information Systems* 16, 1 (2005), 5.

[36] Tanja Sophie Gesk and Michael Leyer. 2022. Artificial intelligence in public services: When and why citizens accept its usage. *Government Information Quarterly* 39, 3 (2022), 101704.

[37] Trisha Greenhalgh, Glenn Robert, Fraser Macfarlane, Paul Bate, and Olivia Kyriakidou. 2004. Diffusion of innovations in service organizations: systematic review and recommendations. *The Milbank Quarterly* 82, 4 (2004), 581–629.

[38] Dogan Gursoy, Oscar Hengxuan Chi, Lu Lu, and Robin Nunkoo. 2019. Consumers acceptance of artificially intelligent (AI) device use in ser vice delivery. *International Journal of Information Management* 49 (2019), 157–169. DOI: https://doi.org/10.1016/j.ijinfomgt.2019.03.008

[39] Joseph F. Hair, G. Tomas M. Hult, Christian Ringle, and Marko Sarstedt. 2017. *A Primer on Partial Least Squares Structural Equation Modeling (Pls-Sem)* (3rd Edition Ed.). Sage publications, Thousand Oaks, CA.

[40] Joseph F. Hair, Jeffrey J. Risher, Marko Sarstedt, and Christian M. Ringle. 2019. When to use and how to report the results of PLS-SEM. *European Business Review* 31, 1 (2019), 2–24.

[41] Joseph F. Hair, Marko Sarstedt, Lucas Hopkins, and Volker G. Kuppelwieser. 2014. Partial least squares structural equation modeling (PLS-SEM). *European Business Review* 26, 2 (2014), 106–121.

[42] Sanjay V. Hanji, Sumukh Hungund, Evgeny Blagov, Sumanth Desai, and Savita S. Hanji. 2024. Examining the factors influencing diffusion and adoption of AI chatbots in tourism and travel industry. In *Proceedings of the Transfer, Diffusion and Adoption of Next-Generation Digital Technologies*. Springer Nature Switzerland, Cham, 150–160.

[43] Harinder Hari, Radha Iyer, and Brinda Sampat. 2022. Customer brand engagement through chatbots on bank websites–examining the antecedents and consequences. *International Journal of Human–Computer Interaction* 38, 13 (2022), 1212–1227.

[44] Pablo Ramires Hernández, David Valle-Cruz, and Rafael Valentín Mendoza Méndez. 2023. Review on the application of artificial intelligence-based chatbots in public administration. In *Proceedings of the Handbook of Research on Applied Artificial Intelligence and Robotics for Government Processes*. IGI Global, 133–155.

[45] Laszlo Horvath, Oliver James, Susan Banducci, and Ana Beduschi. 2023. Citizens' acceptance of artificial intelligence in public services: Evidence from a conjoint experiment about processing permit applications. *Government Information Quarterly* 40, 4 (2023), 101876. DOI: https://doi.org/https://doi.org/10.1016/j.giq.2023.101876

[46] Omar Hujran, Mutaz M. Al-Debei, Ahmad Samed Al-Adwan, Ayman Alarabiat, and Nuseiba Altarawneh. 2023. Examining the antecedents and outcomes of smart government usage: An integrated model. *Government Information Quarterly* 40, 1 (2023), 101783. DOI: https://doi.org/https://doi.org/10.1016/j.giq.2022.101783

[47] Ramizatunnisah Jais and Abdul Hafaz Ngah. 2024. The moderating role of government support in chatbot adoption intentions among Malaysian government agencies. *Transforming Government: People, Process and Policy*. DOI: https://doi.org/10.1108/TG-02-2023-0026

[48] Andreas Janson. 2023. How to leverage anthropomorphism for chatbot service interfaces: The interplay of communication style and personification. *Computers in Human Behavior* 149, (2023), 107954. DOI: https://doi.org/https://doi.org/10.1016/j.chb.2023.107954

[49] Omar Jawabreh, Ra'ed Masa'deh, and Emad Al Dein Al Fahmawee. 2025. Adoption of Artificial Intelligence Chatbots in Tourism in Jordan. In *Proceedings of the Generative AI in Creative Industries*. Springer, 101–116.

[50] Munshi Muhammad Abdul Kader Jilani, Md Moniruzzaman, Mouri Dey, Edris Alam, and Md Aftab Uddin. 2022. Strengthening the trialability for the intention to use of mHealth apps amidst pandemic: A cross-sectional study. *International Journal of Environmental Research and Public Health* 19, 5 (2022), 2752.

[51] Jingrui Ju, Qingguo Meng, Fangfang Sun, Luning Liu, and Shweta Singh. 2023. Citizen preferences and government chatbot social characteristics: Evidence from a discrete choice experiment. *Government Information Quarterly* 40, 3, Article 101785 (2023). DOI: https://doi.org/https://doi.org/10.1016/j.giq.2022.101785

[52] Elena Karahanna, Detmar W. Straub, and Norman L. Chervany. 1999. Information technology adoption across time: A cross-sectional comparison of pre-adoption and post-adoption beliefs1. *MIS Quarterly* 23, 2 (1999), 183–213.

[53] Kerk F. Kee. 2017. Adoption and diffusion. *The International Encyclopedia of Organizational Communication* 1 (2017), 41–54.

[54] Sage Kelly, Sherrie-Anne Kaye, and Oscar Oviedo-Trespalacios. 2023. What factors contribute to the acceptance of artificial intelligence? A systematic review. *Telematics and Informatics* 77, (2023), 101925. DOI: https://doi.org/https://doi.org/10.1016/j.tele.2022.101925

[55] Sachin Kuberkar and Tarun Kumar Singhal. 2020. Factors influencing adoption intention of AI powered chatbot for public transport services within a smart city. *International Journal of Emerging Technologies in Learning* 11, 3 (2020), 948–958.

[56] Sven Laumer, Christian Maier, and Fabian Tobias Gubler. 2019. Chatbot acceptance in healthcare: Explaining user adoption of conversational agents for disease diagnosis.

[57] Christofer Laurell, Christian Sandström, Adam Berthold, and Daniel Larsson. 2019. Exploring barriers to adoption of virtual reality through social media analytics and machine learning – an assessment of technology, network, price and trialability. *Journal of Business Research* 100, (2019), 469–474. DOI: https://doi.org/https://doi.org/10.1016/j.jbusres.2019.01.017

[58] Jung Lee and Xueqing Chen. 2022. Exploring users' adoption intentions in the evolution of artificial intelligence mobile banking applications: The intelligent and anthropomorphic perspectives. *International Journal of Bank Marketing* 40, 4 (2022), 631–658. DOI: https://doi.org/10.1108/IJBM-08-2021-0394

[59] Mengjun Li and Ayoung Suh. 2021. Machinelike or humanlike? A literature review of anthropomorphism in AI-enabled technology. In *Proceedings of the 54th Hawaii International Conference on System Sciences*. 4053–4062. Retrieved January 04, 2021 from https://scholarspace.manoa.hawaii.edu/bitstream/10125/71110/1/0399.pdf

[60] Xuesong Li and Jian Wang. 2024. Should government chatbots behave like civil servants? The effect of chatbot identity characteristics on citizen experience. *Government Information Quarterly* 41, 3 (2024), 101957. DOI: https://doi.org/https://doi.org/10.1016/j.giq.2024.101957

[61] Zhixuan Lian and Fang Wang. 2024. Government chatbot: Empowering smart conversations with enhanced contextual understanding and reasoning. *Journal of Information Science*. DOI: https://doi.org/10.1177/01655515241268863

[62] Moez Limayem, Sabine Gabriele Hirt, and Christy MK Cheung. 2007. How habit limits the predictive power of intention: The case of information systems continuance1. *MIS Quarterly* 31, 4 (2007), 705–737.

[63] Rong-Rong Lin, Yong Zheng, and Jung-Chieh Lee. 2023. Artificial intelligence-based pre-implementation interventions in users' continuance intention to use mobile banking. *International Journal of Mobile Communications* 21, 4 (2023), 518–540. DOI: https://doi.org/10.1504/ijmc.2023.131165

[64] Kaifeng Liu and Da Tao. 2022. The roles of trust, personalization, loss of privacy, and anthropomorphism in public acceptance of smart healthcare services. *Computers in Human Behavior* 127 (2022), 107026.

[65] Andreas Lommatzsch. 2018. A next generation chatbot-framework for the public administration. In *Proceedings of the International Conference on Innovations for Community Services*. Springer, 127–141.

[66] Rohit Madan and Mona Ashok. 2023. AI adoption and diffusion in public administration: A systematic literature review and future research agenda. *Government Information Quarterly* 40, 1 (2023), 101774. DOI: https://doi.org/https://doi.org/10.1016/j.giq.2022.101774

[67] Giulia Maragno, Luca Tangi, Luca Gastaldi, and Michele Benedetti. 2023. AI as an organizational agent to nurture: Effectively introducing chatbots in public entities. *Public Management Review* 25, 11 (2023), 2135–2165.

[68] Davit Marikyan, Savvas Papagiannidis, and Eleftherios Alamanos. 2023. Cognitive dissonance in technology adoption: a study of smart home users. *Information Systems Frontiers* 25, 3 (2023), 1101–1123.

[69] Davit Marikyan, Savvas Papagiannidis, and Gavin Stewart. 2026. Technology acceptance research: Meta-analysis. *Journal of Information Science* 52, 2 (2026), 429–450.

[70] Patrick Mikalef, Kristina Lemmer, Cindy Schaefer, Maija Ylinen, Siw Olsen Fjørtoft, Hans Yngvar Torvatn, Manjul Gupta, and Bjoern Niehaves. 2022. Enabling AI capabilities in government agencies: A study of determinants for European municipalities. *Government Information Quarterly* 39, 4 (2022), 101596. DOI: https://doi.org/https://doi.org/10.1016/j.giq.2021.101596

[71] Somang Min, Kevin Kam Fung So, and Miyoung Jeong. 2019. Consumer adoption of the Uber mobile application: Insights from diffusion of innovation theory and technology acceptance model. *Journal of Travel and Tourism Marketing* 36, 7 (2019), 770–783.

[72] Ministry of Digital Economy and Entrepreneurship. 2021. Launch of Sanad Jo Virtual Government Chatbot Services. Retrieved October 5, 2025 from https://jordantimes.com/news/local/digital-economy-ministry-launches-virtual-government-centre-%E2%80%98sanad-jo%E2%80%99

[73] Ministry of Digital Economy and Entrepreneurship. 2026. Jordan Digital Transformation Strategy 2026–2028 and Executive Plan. Retrieved March 10, 2026 https://www.modee.gov.jo/ebv4.0/root_storage/en/eb_list_page/jordanian_digital_transformation_strategy_and_the_implementation_plan_2026-2028.pdf

[74] Ministry of Justice Jordan. 2018. Reactivation of Good Conduct Certificate Service via Chatbot on Facebook Messenger. Retrieved April 15, 2026 from https://moj.gov.jo/Default/En

[75] Ibrahim Mohamad, Laurie Hughes, Ali Abdallah Alalwan, Tegwen Malik, and Yogesh K. Dwivedi. 2026. Examining the factors influencing citizen adoption of e-government chatbot services in Jordan: A longitudinal survey study. *Technological Forecasting and Social Change* 222, (2026), 124398. DOI: https://doi.org/https://doi.org/10.1016/j.techfore.2025.124398

[76] Gary C. Moore and Izak Benbasat. 1991. Development of an instrument to measure the perceptions of adopting an information technology innovation. *Information Systems Research* 2, 3 (1991), 192–222.

[77] Joaria Moreira and Mijail Naranjo-Zolotov. 2023. Exploring potential drivers of citizen's acceptance of artificial intelligence use in e-government. In *Proceedings of the World Conference on Information Systems and Technologies*. Springer, 336–345.
[78] Joaria Moreira and Mijail Naranjo-Zolotov. 2024. Exploring potential drivers of citizen.s acceptance of artificial intelligence use in e-government. In *Information Systems and Technologies: WorldCIST 2023*. Vol. 3, Lecture Notes in Networks and Systems. Springer Nature Switzerland, Cham, 336–345. DOI: https://doi.org/10.1007/978-3-031-45648-0_33
[79] Rania Badr Mostafa and Tamara Kasamani. 2022. Antecedents and consequences of chatbot initial trust. *European Journal of Marketing* 56, 6 (2022), 1748–1771.
[80] Mohammad Mousa Mousa, Mustafa Akaileh, Ethar Khalaf Alhumeisat, Najwan Ibrahim Jadallah, Hussein NE Edrees, Nadir Aliane, Amer AN Al-Qutaish, and Abu Elnasr E Sobaih. 2025. Factors influencing intention to adopt AI chatbot in civil status and passport department in jordan: The moderating role of trust in technology. *Journal of Posthumanism* 5, 3 (2025), 1444–1466.
[81] Sara Moussawi, Marios Koufaris, and Raquel Benbunan-Fich. 2021. How perceptions of intelligence and anthropomorphism affect adoption of personal intelligent agents. *Electronic Markets* 31, 2 (2021), 343–364. DOI: https://doi.org/10.1007/s12525-020-00411-w
[82] Mimi Nurakmal Mustapa, Suraya Hamid, and Fariza Hanum Md Nasaruddin. 2022. Factors influencing open government data post-adoption in the public sector: The perspective of data providers. *PLoS One* 17, 11 (2022), e0276860.
[83] Karin Olesen, Lincoln C. Wood, and Josephine L. L. Chong. 2021. Citizen adoption in e-government systems: A meta analysis. *Journal of Global Information Management* 29, 6 (2021), 1–28.
[84] Nessrine Omrani, Giorgia Rivieccio, Ugo Fiore, Francesco Schiavone, and Sergio Garcia Agreda. 2022. To trust or not to trust? An assessment of trust in AI-based systems: Concerns, ethics and contexts. *Technological Forecasting and Social Change* 181, (2022), 121763.
[85] Hannah Overbye-Thompson and Kristy A Hamilton. 2025. A diffusion of innovations measurement scale for reinvention, relative advantage, compatibility, complexity, trialability and observability. *PLoS One* 20, 10 (2025), e0334616.
[86] Theodoros Papadopoulos, Charalampos Alexopoulos, and Yannis Charalabidis. 2025. Evaluating chatbot architectures for public service delivery: Balancing functionality, safety, ethics, and adaptability. *Frontiers in Political Science* 7, (2025), 1–28.
[87] Dong-Min Park, Seong-Soo Jeong, and Yeong-Seok Seo. 2022. Systematic review on chatbot techniques and applications. *Journal of Information Processing Systems* 18, 1 (2022), 26–47.
[88] Nicolas Pfeuffer, Alexander Benlian, Henner Gimpel, and Oliver Hinz. 2019. Anthropomorphic information systems. *Business and Information Systems Engineering* 61, 4 (2019), 523–533.
[89] Davinia Rodríguez Cardona, Oliver Werth, Svenja Schönborn, and Michael H. Breitner. 2019. A mixed methods analysis of the adoption and diffusion of Chatbot Technology in the German insurance sector.
[90] Everett M. Rogers. 2003. *Diffusion of Innovations*. Free Press, New York, NY, USA.
[91] M. Rogers. 1995. *Diffusion of Innovations* (5th. ed.). The Free Press, New York.
[92] Julia Romberg and Tobias Escher. 2024. Making sense of citizens' input through artificial intelligence: A review of methods for computational text analysis to support the evaluation of contributions in public participation. *Digital Government: Research and Practice* 5, 1 (2024), 1–30.
[93] Uma Sekaran and Roger Bougie. 2010. *Research Methods for Business: A Skill Building Approach*. John Wiley & Sons.
[94] S. Senadheera, T. Yigitcanlar, K. C. Desouza, K. Mossberger, J. Corchado, R. Mehmood, R. Y. M. Li, and P. H. Cheong. 2024. Understanding chatbot adoption in local governments: A review and framework. *Journal of Urban Technology* 32, 3 (2024), 35–69. DOI: https://doi.org/10.1080/10630732.2023.2297665
[95] Aayat Shdaifat, Randa Obeidallah, and Alaa Abu-Srhan. 2026. Using UTAUT2 to study the impact of chatbot on the development of M-Commerce in jordan. In *Proceedings of the Computational Intelligence for Business Analytics and Decision Systems*. Springer, 49–61.
[96] Gabriely Oliveira da Silva Batista, Mateus de Souza Monteiro, and Luciana Cardoso de Castro Salgado. 2022. How do ChatBots look like?: A comparative study on government chatbots profiles inside and outside Brazil. In *Proceedings of the Simpósio Brasileiro sobre Fatores Humanos em Sistemas Computacionais*. SBC.
[97] Kwonsang Sohn and Ohbyung Kwon. 2020. Technology acceptance theories and factors influencing artificial Intelligence-based intelligent products. *Telematics and Informatics* 47, (2020), 101324. DOI: https://doi.org/https://doi.org/10.1016/j.tele.2019.101324
[98] Michael Soprano, Kevin Roitero, Vincenzo Della Mea, and Stefano Mizzaro. 2023. Towards a conversational-based agent for health services. In *Proceedings of the 3rd National Conference on Artificial Intelligence (Ital-IA 2023). CEUR Workshop Proceedings 3486*. CEUR-WS.org. Pisa, Italy, 278–283.
[99] James P Stevens. 2012. *Applied Multivariate Statistics for the Social Sciences* (5th. ed.). Routledge.
[100] Tara Qian Sun and Rony Medaglia. 2019. Mapping the challenges of Artificial Intelligence in the public sector: Evidence from public healthcare. *Government Information Quarterly* 36, 2 (2019), 368–383. DOI: https://doi.org/10.1016/j.giq.2018.09.008
[101] United Nations. 2024. Accelerating digital transformation for sustainable development. United Nation, New York. Retrieved October 3, 2024 from file:///C:/Users/Master/Desktop/Web%20Version%20_E-Government%20Survey%202024%2011102024.pdf
[102] Viswanath Venkatesh, Michael G. Morris, Gordon B. Davis, and Fred D. Davis. 2003. User acceptance of information technology: Toward a unified view. *MIS Quarterly* 27, 3 (2003), 425–478.

[103] Viswanath Venkatesh, James Y. L. Thong, and Xin Xu. 2012. Consumer acceptance and use of information technology: Extending the Unified Theory of Acceptance and Use of Technology1. *MIS Quarterly* 36, 1 (2012), 157–178.
[104] Viswanath Venkatesh, James Y. L. Thong, and Xin Xu. 2012. Consumer acceptance and use of information technology: Extending the Unified Theory of Acceptance and Use of Technology1. *MIS Quarterly* 36, 1 (2012), 157–178.
[105] Chian-Wen Wang, Bo-Ya Hsu, and Don-Yun Chen. 2024. Chatbot applications in government frontline services: Leveraging artificial intelligence and data governance to reduce problems and increase effectiveness. *Asia Pacific Journal of Public Administration* 46, 4 (2024), 488–511. DOI: https://doi.org/10.1080/23276665.2024.2397677
[106] Xiwei Wang, Ran Luo, Yutong Liu, Peng Chen, Yuanyuan Tao, and Yuming He. 2023. Revealing the complexity of users' intention to adopt healthcare chatbots: A mixed-method analysis of antecedent condition configurations. *Information Processing and Management* 60, 5 (2023), 103444. DOI: https://doi.org/https://doi.org/10.1016/j.ipm.2023.103444
[107] Youkui Wang, Nan Zhang, and Xuejiao Zhao. 2022. Understanding the determinants in the different government AI adoption stages: Evidence of local government chatbots in China. *Social Science Computer Review* 40, 2 (2022), 534–554.
[108] Youkui Wang, Nan Zhang, and Xuejiao Zhao. 2022. Understanding the determinants in the different government AI adoption stages: Evidence of local government chatbots in China. *Social Science Computer Review* 40, 2 (2022), 534–554. DOI: https://doi.org/10.1177/0894439320980132
[109] Youwei Wang, Darren Meister, and Yinglei Wang. 2008. Relative advantage and perceived usefulness: The adoption of competing ICTs. *DIGIT 2008 Proceedings*, 6. Retrieved from https://aisel.aisnet.org/digit2008/6
[110] Bernd W. Wirtz, Jan C. Weyerer, and Michael Rösch. 2018. Citizen and open government: An empirical analysis of antecedents of open government data. *International Journal of Public Administration* 41, 4 (2018), 308–320. DOI: https://doi.org/10.1080/01900692.2016.1263659
[111] Meng-Jia Wu, Kelly Zhao, and Francisca Fils-Aime. 2022. Response rates of online surveys in published research: A meta-analysis. *Computers in Human Behavior Reports* 7, (2022), 100206. DOI: https://doi.org/10.1016/j.chbr.2022.100206
[112] Kum Fai Yuen, Yiik Diew Wong, Fei Ma, and Xueqin Wang. 2020. The determinants of public acceptance of autonomous vehicles: An innovation diffusion perspective. *Journal of Cleaner Production* 270, (2020), 121904.
[113] Mengyao Zhang, Beichen Lu, and Yuanyuan Guo. 2025. Public sense of gain from using AI-Driven governmental chatbots for public services. *International Journal of Information Systems in the Service Sector* 16, 1 (2025), 1–25. DOI: https://doi.org/https://doi.org/10.4018/IJISSS.387416

Received 21 November 2025; revised 24 September 2026; accepted 26 September 2026