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HOW GENDER AFFECT RELATIONSHIPS BETWEEN VARIABLES IN INFORMATION SYSTEMS USAGE AND USER SATISFACTION MODEL

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Abstract
This paper aims to explore the role of gender as moderating variables for the relationships between variables in the modified information system success model. This research is needed to uncover whether the gender gap exists in information system implementation. The result of the study This digitization in organization which focus on its impact for defining the usage of information system and user satisfaction. A quantitative study using PLS-SEM had been employed to reveal whether gender has influence on the relationships between variables. A data collection was conducted using questionnaire which was distributed in a private university. There are 146 data from respondents that can be used for data analysis. Using both PLS algorithm and bootstrapping procedure in SmartPLS®, several findings can be excerpt from the analysis. First, gender affects the relationship between information quality and actual use. Second, gender does not have impact on the relationship between system quality and actual use, perceived benefit and actual use, service quality and actual use, actual use and user satisfaction. As general conclusion, gender does not impact most factors of the information system usage and satisfaction model. This result is promising in term of gender role in digitation process in organization since gender gap mostly does not exist. Further analysis and implications are discussed in the article.

Keywords: Information system success, Gender, Moderating variable, System usage, User satisfaction.

INTRODUCTION

Digital transformation has become a critical focus for organizations across industries and regions. In implementing information systems (IS) and digitalization initiatives, gender has emerged as an important factor that influencing the success of digitization in organization (Goswami and Dutta 2016; Doshi, Nigam, and Rishi 2023). Researchers have increasingly examined how differences between men and women affect technology adoption, leadership in IT projects, user acceptance (or resistance), and the outcomes of digital initiatives. Numerous studies indicate that gender influences the adoption and use of new information technologies in the workplace. Overall, men often exhibit a higher propensity to adopt emerging IT systems and more positive attitudes toward technology use, although the gap is context-dependent. A systematic review by Shaouf and Altaqqi (2018) found that, in general, men are more likely than women to try new IT and tend to evaluate digital interfaces more positively. Similarly, a meta-analysis study by Cai, Fan, and Du (2017) confirmed that males hold slightly more favorable attitudes toward technology, with only minimal narrowing of this attitudinal gap in recent years.

From a behavioral perspective, women and men may also differ in what drives their acceptance of technology. Earlier technology acceptance models (e.g., TAM and UTAUT) identified gender as a moderator of key factors like perceived usefulness and ease of use.

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For instance, women have been found to place greater emphasis on ease of use and social influence, whereas men focus more on performance expectancy (usefulness) when deciding to use a system (Venkatesh, Davis, and Morris 2007). Recent research continues to support such patterns. For example, Shahbaz et al. (2020) observation in a healthcare Big Data Analytics (BDA) project shows that male employees showed stronger intentions to use the new system compared to female employees. They attributed this in part to self-efficacy – with men reporting higher computer self-confidence – and noted that women on average exhibited more caution or skepticism toward the unfamiliar technology. These findings suggest that organizations should account for differing adoption drivers, for example, providing additional training or emphasizing ease of use may be especially important to encourage technology uptake among female staff.

LITERATURE REVIEW

The examination of Information Systems (IS) success, particularly through the lens of the DeLone and McLean model (DeLone and McLean 2003), emphasizes the intrinsic relationship between information quality and the actual use of these systems. Information quality, which encompasses the facets of accuracy, timeliness, and relevance, significantly influences users' perceptions and attitudes towards system use. This connection is pivotal as it can result in user satisfaction and the perceived effectiveness of the information system in fulfilling organizational goals.

Empirical studies have demonstrated that high information quality can lead to increased user engagement and satisfaction, which, in turn, promotes actual use of the system. For instance, (Floropoulos et al. 2010) illustrate that in the context of the Greek Taxation Information System, the quality of information plays an integral role in enabling users to effectively execute their tasks. Conversely, (Owusu 2020) indicates that although perceived information quality promotes user satisfaction, it does not inherently guarantee actual usage of the system. A study by Angelina, Hermawan, and Suroso (2019) apply the DeLone and McLean model within e-commerce success contexts to illustrate the critical link between information quality and user outcomes, such as system use and net benefits. Their findings reinforce the principle that quality information enhances not only user satisfaction but also encourages users to fully engage with the system's functionalities. In a study of business intelligence systems, Montero and Lind (2020) found that system quality and information quality simultaneously influence usage behavior. Their quantitative analysis supports the premise that the quality of information significantly impacts its application by users, emphasizing the need for organizations to prioritize the enhancement of information quality standards.

Another variable that is often included in the information system assessment model is system quality as the antecedent for system use. Researches have consistently demonstrated that system quality is a significant predictor of user satisfaction and actual use. For instance, the study by Rachmat, Hamzah, and Niswar (2022) empirically validated the hypothesis that system quality directly influences user satisfaction, which in turn affects actual use. The

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significance of system quality extends beyond mere user satisfaction to encompass individual and organizational impacts, as elaborated in various studies, including those by Qahman et al. (2023) and Alkhawaja et al. (2022). They affirm that high system quality fosters a conducive environment for users, making it essential for any IS aiming for sustained engagement and effectiveness. Furthermore, Cheng (2014)'s work supports the premise that quality dimensions in an IS paradigm emphasize the strong correlation between quality, user satisfaction, and the propensity for actual use.

In the updated DeLone & McLean (D&M) Information Systems Success framework (DeLone and McLean 2003), system use and user satisfaction function as core dependent variables because they capture, respectively, the realized behavioral uptake of a system and users' evaluative judgments about it. Contemporary meta-reviews, such as (Jami Pour, Mesrabadi, and Asarian 2022) and (Jeyaraj 2020), and validations, such as (Mardiana, Tjakraatmadja, and Aprianingsih 2015), (Banafo Akrong, Yunfei, and Owusu 2022), and (Çelik and Ayaz 2022), consistently model them as outcomes of the three quality antecedents—information quality, system quality, and service quality—and as proximal drivers of downstream "net benefits." However, in this research, perceived benefit is added as antecedent to system use. The role of perceived benefits in driving technology usage is a fundamental concept in technology adoption literature. Research indicates that perceived benefits, often framed within the constructs of various theory models such as the Technology Acceptance Model (TAM) (Davis 1986) and the Unified Theory of Acceptance and Use of Technology (UTAUT) [20, 21], significantly influence users' adoption intentions. Perceived benefits typically encompass user perceptions of the positive outcomes yielded by the technology, including increased efficiency, cost savings, improved performance, and enhanced convenience. For example, (Mamonov and Benbunan-Fich 2019) emphasize that perceived usefulness, a component of TAM, reflects the degree to which a user believes that utilizing a specific technology will enhance their task performance. This perceived usefulness is a decisive factor in users' intention to adopt smart home technologies, suggesting that when potential adopters recognize substantial perceived benefits, their willingness to embrace the technology increases significantly. Similarly, (Sriram and Mohanasundaram 2021) found that perceived usefulness and perceived ease of use are essential factors influencing healthcare professionals' adoption of Health Management Information Systems (HMIS), underscoring the critical role of perceived benefits in predicting adoption intentions in health technology contexts.

Moreover, findings regarding digital finance adoption corroborate this notion. In a study to explore the influence of perceived risk and benefit in digital finance adoption, (Jain and Raman 2022) demonstrated that perceived risks and benefits considerably affected the variance in users' intentions to adopt digital finance solutions, suggesting that high perceived benefits directly correlate with a higher likelihood of technology adoption. When perceived benefit is juxtaposed against perceived cost, a study by (Wang, Ha-Brookshire, and Bonifay 2022) indicated that perceived benefits create significant motivation for individuals to engage with new technologies, reinforcing the idea that a high perceived benefit leads to

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increased technology adoption behaviors. Similar result is founded in a study of fintech adoption by (Sadiq, Baneen, and Abbas 2023) that elaborate on how users are motivated to use the system due to the perceived ease of use and efficiency benefits offered by these technologies, which play a crucial role in both initial and continued usage. This indicates that recognizing and promoting the tangible benefits of a technology to potential users can facilitate not only initial adoption (start using the system) but also long-term user engagement.

In term of information system success model, service quality is among variables that are recommended as antecedent for actual system use (DeLone and McLean 2003). Service quality is characterized by responsiveness, reliability, and support (Pitt, Watson, and Kavan 1995), significantly contributes to user satisfaction and the overall success of technology systems. This relationship is well-supported by numerous studies, reflecting a consistent theme across various sectors, including e-commerce, healthcare, and education. Choi et al. (2013) highlights that high service quality results in increased user satisfaction, which subsequently drives technology usage. They assert that effective management of service quality metrics is vital for enhancing user engagement with online services, as it ultimately influences customer satisfaction and their intention to continue using the service. This indicates that when users experience prompt and effective support, they are more likely to utilize the technology regularly. Further backing this claim, Khatoon, Zhengliang, and Hussain (2020) found that service quality positively affects user satisfaction for electronic banking services. The study concluded that improvements in service quality leads to higher user satisfaction ratings, which in turn correlate with increased likelihood of continued use. This aligns with the notion that effective customer support and services are essential in fostering not only initial adoption but also sustained usage of the technology

In the context of educational technology, Li et al. (2012) emphasized the significance of service quality in shaping satisfaction levels among users of e-learning systems. Their study indicated that users' perceptions of service quality, particularly the support they receive from technical staff, greatly influenced their intention to continue using e-learning technologies. This comprehension of service quality as a beneficial factor reflects the necessity of reliable and supportive services in enhancing user engagement and satisfaction. Moreover, in e-banking environments, the role of service quality has been further emphasized by Morris, Mbamba, and Kessy (2024), who pointed out that specific service quality attributes, like responsiveness and customer support, significantly enhance user engagement within e-banking transactions. The relevance of these attributes reinforces the notion that effective service delivery directly correlates with users' likelihood to utilize the technology continuously.

METHOD

Based on the discussion in the introduction, therefore the research model of information system usage and user satisfaction with gender as moderator variable can be depicted in Figure 1. The research method used quantitative study and using PLS-SEM data

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analysis since PLS-SEM is quite robust and suitable method for SEM analysis (Henseler, Hubona, and Ray 2016). Data collection was conducted using questionnaire that was distributed to a private university's lecturers. The lecturers are given the questionnaire to asses the learning management system which was newly launched. The data collection process gave 146 data from respondent that can be used for data analysis. The SmartPLS® application was being used for data analysis since SmartPLS is considered as the most widely adopted tools for PSL-SEM analysis (Ringle et al. 2023).

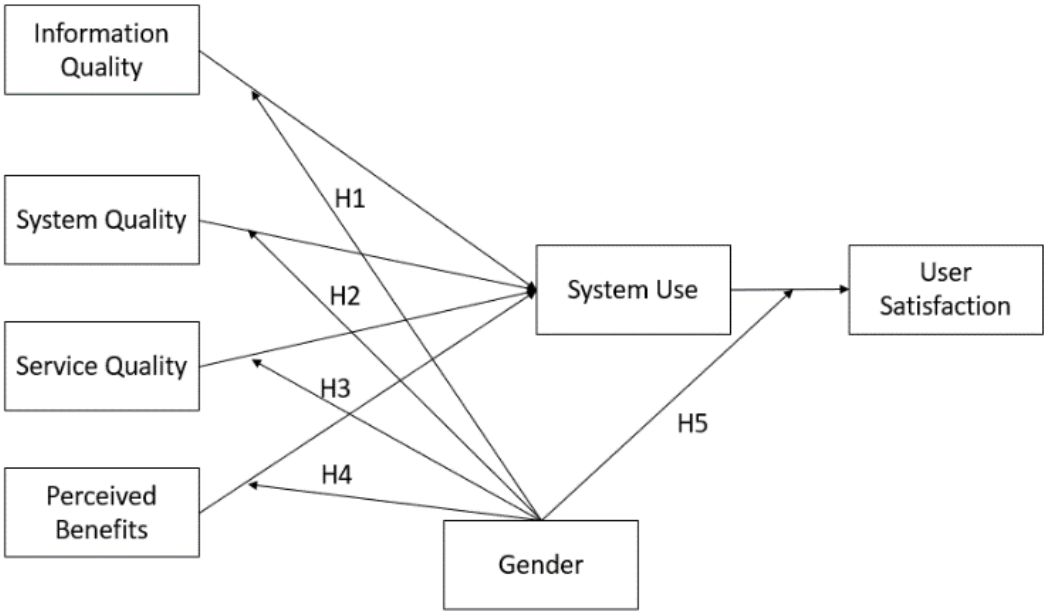

Figure 1. Research Model for Information System Usage and User Satisfaction

There are five hypotheses for this research (as depicted in Figure 1):
H1: Gender significantly affects the relationship between Information Quality and System Use
H2: Gender significantly affects the relationship between System Quality and System Use
H3: Gender significantly affects the relationship between Service Quality and System Use
H4: Gender significantly affects the relationship between Perceived Benefit and System Use
H5: Gender significantly affects the relationship between System Use and User Satisfaction

RESULTS AND DISCUSSION

Contents Results and Discussion

The descriptive analysis of the data gives the result for the number of each gender shown in Table 1. It can be seen that the number of respondents by their gender is almost 50:50 between male and female.

Table 1. Gender data

Variable	Description	Frequency	Percent
Gender	Male	74	50.7%
	Female	72	49.3%

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In SmartPLS® the assessment for the moderating variable is using bootstrapping process. Moderating effect is considered significant if the P value is less than the alpha value which is 0.05. The result is given in Table 2. The only significant result for gender moderating effect is on the relationship between Information Quality and System Use. The remaining result are not significant.

Table 2. The result of moderating effect of gender on the relationships in the model

Hypothesis	The relationship	P Values	Result
H1	Information Quality → System Use	0.014	Significant
H2	System Quality→ System Use	0.462	Not Significant
H3	Service Quality →System Use	0.434	Not Significant
H4	Perceived Benefit →System Use	0.429	Not Significant
H5	System Use→ User Satisfaction	0.129	Not Significant

Figure 2 is the result diagram based on Table 2. The thick arrow depicts the significant impact of gender on the relationship between variables, while the thin arrow shows the insignificant impact of gender towards certain relationship between variables.

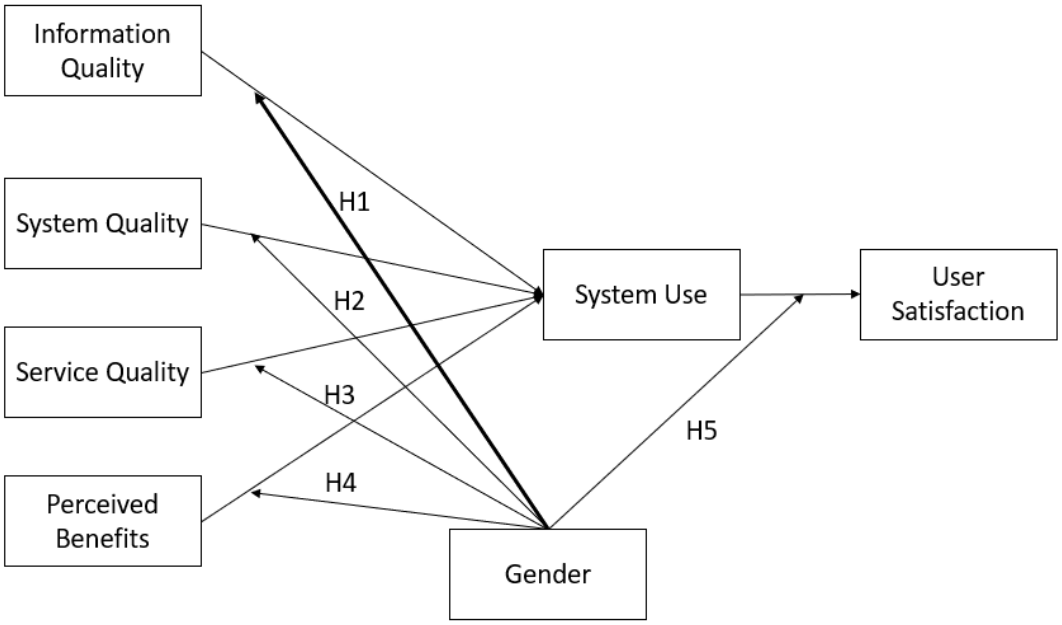

Figure 2. The result of the significance impact of gender toward relationships in the research model (thick line → significant, thin line → not significant)

Contents of Discussion Results

The result of data analysis gives somewhat a relieving outcome. A significant moderating impact of gender means that "gender gap" exists. The result shows that most hypotheses are insignificant, and only one hypothesis gives the significant result. The finding that gender moderates the effect of Information Quality on System Use is consistent with recent evidence in digital learning and public e-services. In a large, multi-group LMS study,

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gender moderated on how content quality shaped downstream beliefs (e.g., perceived ease of use), indicating that men and women process information cues differently when forming usage judgments about educational platforms (Binyamin, Rutter, and Smith 2020). In e-government, a study explicitly asked whether gender moderates the link between information quality and adoption and reported a significant moderation, reinforcing that Information Quality's impact on (intended) use is not uniform across sex (Razak, Bakar, and Abdullah 2022). The timing and context of the study likely amplified Information Quality's salience. Because the LMS was newly launched, lecturers' early judgments about content accuracy, completeness, and timeliness (e.g., course outlines, grading rubrics, resource links) plausibly dominated their usage decisions—far more than "downstream" qualities that become salient with prolonged use (e.g., service/assurance interactions). This "early-phase Information Quality primacy" is consistent with D&M evidence in education and knowledge-sharing settings where Information Quality strongly shapes use and continuance, often via perceived benefits.

In many domains, System Quality (e.g., reliability, response time, navigability) predicts intention/use and sometimes shows gendered effects, as a recent multi-group analysis of social networking platforms demonstrates (Doshi, Nigam, and Rishi 2023). However, the LMS deployment in this private university produced no significant gender moderation on System Quality→System Use. Three explanations are plausible. First, a low variance/high floor of System Quality in an institutional LMS roll-out—if stability and speed are uniformly acceptable, between-group differences in how System Quality moves behavior can be small. Second, an indirect (mediated) rather than direct pathways: in learning systems, System Quality often feeds perceived usefulness and ease-of-use, which then drive use; moderation may occur on those belief links rather than on the direct System Quality→System Use path (as shown in several e-learning studies) (Jami Pour, Mesrabadi, and Asarian 2022). Third, the context specificity: the social-media setting where System Quality→Use varies by gender (stronger for one sex) is not isomorphic to a faculty LMS, where task norms and organizational requirements constrain discretionary use. Evidence from enterprise IS also suggests that System Quality collaborates with service quality to promote extended use (deeper, more feature-rich usage) after go-live—effects that may precede or overshadow gender differences in the direct System Quality→Use path during stabilization (Hsu, Yen, and Chung 2015).

The result of non-significant moderating effect of gender on the relationship Service Quality→System Use is because in most organization today, providing a good service to system users is requirement. Therefore, regardless of gender, the impact of the service is the same. Service quality in digital services (assurance, responsiveness, empathy) typically affects trust and satisfaction, which in turn shape continuance; gender can moderate parts of these chains in consumer finance (mobile banking). For example, in Tunisian mobile banking, gender and age moderated relationships from e-service quality to e-trust/e-satisfaction (Trabelsi-Zoghlami, Berraies, and Ben Yahia 2020). In the present organizational LMS, such customer-service interactions may have been less salient for

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lecturers during early adoption (help desk use may be sporadic; IT assurances standardized institution-wide), reducing the scope for gender-contingent Service Quality→System Use effects to emerge.

In the relationship between Perceived Benefit (PB) → System Use, gender has a non significant moderating effect. UTAUT2 posits that gender moderates the performance-expectancy (benefit) path to intention/use; this is frequently observed in consumer settings (e.g., mobile payments), where men often weight instrumental outcomes more heavily, while women's decisions integrate value, trust, and social cues (Liébana-Cabanillas et al. 2021). However, in the university LMS work context, perceived benefits (e.g., administrative efficiency, assessment management) may have been widely shared across genders or partially mandated by institutional policy, dampening between-group elasticity. Moreover, benefit-to-use effects are often mediated by satisfaction and confirmation in post-adoption models (e.g., value-based ECM), so moderation can hide in those unmodeled mediators rather than in a direct Perceived Benefit→System Use link—consistent with continuance studies in IPTV and virtual worlds where net value/benefits predict continuance via affective mechanisms (Lin et al. 2012).

The non-significant moderation of gender between System Use → User Satisfaction aligns with meta-analytic e-learning evidence that gender differences in satisfaction are small or context dependent; in many studies, female and male learners report broadly similar satisfaction once they have used the platform, even when antecedent paths differ (Yu and Deng 2022). In the information system success literature, System Use and User Satisfaction are reciprocally related (use yields experiences that shape satisfaction; satisfaction drives continuance), but the strength/direction of this link varies by setting and voluntariness—helping explain why moderation by gender is not consistently observed (Jeyaraj 2020).

CONCLUSION

The study concludes that gender moderates only the path from Information Quality to System Use, while its moderating effects on System Quality → System Use, Service Quality → System Use, Perceived Benefit → System Use, and System Use → User Satisfaction are not supported. Using PLS-SEM on survey data from 146 lecturers (74 men, 72 women) who evaluated a newly launched LMS, bootstrapping results show a significant moderation for H1 (Information Quality→System Use; $p = 0.014$) and non-significant effects for H2–H5 ($p = 0.462$, 0.434, 0.429, and 0.129, respectively). As visualized in Figure 2 (thick arrow for the single significant path) and summarized in Table 2, these findings indicate that men and women differentially translate information-quality cues (e.g., accuracy, completeness, timeliness) into actual system usage, whereas the influence of system performance, service support, perceived benefits, and the downstream link from use to satisfaction appear gender-invariant in this organizational context. The near 50:50 gender split bolsters the stability of the moderation test for H1 within this sample. The pattern is consistent with an early-phase adoption dynamic in which information artifacts dominate use decisions, while

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system/service layers and benefit realizations either do not differ meaningfully by gender or operate via mediators not modeled here (e.g., perceived ease-of-use or trust).

Taken together, the results suggest targeting information quality as the primary lever for gender-responsive adoption strategies in the initial stages of digitization: standardizing and signaling the accuracy, completeness, and timeliness of LMS content (syllabi, rubrics, resources) is likely to yield the largest behavioral gains across groups. At the same time, the non-significant moderation on the other four links implies that, at rollout, system reliability, service responsiveness, perceived benefits, and the translation from use to satisfaction may be experienced similarly by men and women—a useful cue for prioritizing investments that benefit all users equally. Future work should extend these findings beyond a single-institution, cross-sectional design by: testing mediated mechanisms (e.g., Information Quality→perceived usefulness/ease→Use), assessing measurement invariance before multi-group comparisons, and complementing surveys with usage-log data to observe whether gender differences emerge in depth or breadth of use over time. Such steps would refine the understanding of when and why gender matters in the quality-to-use chain and help organizations stage their digitization roadmaps accordingly.

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