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Employee Perceptions Towards Biometric Attendance System: An Extended TAM-Based Study in Jordanian Ministry of Health Hospitals

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Abstract: Public healthcare institutions increasingly mandate biometric attendance systems to strengthen administrative transparency and workforce governance, yet employee cognitive evaluation of such technologies under institutional coercion remains undertheorized. This study reconceptualizes Perceived Usefulness (PU) as perceived operational legitimacy in mandatory-use contexts and empirically tests its perceptual determinants within Jordanian public hospitals. A cross-sectional survey of 220 Ministry of Health employees was analyzed using structural equation modeling. Measurement diagnostics confirmed reliability, convergent validity, and discriminant validity, demonstrating that legitimacy-oriented PU is empirically distinct from related perceptual constructs. Results indicate that Perceived Ease of Use exerts the strongest influence on legitimacy-PU ($\beta = 0.52$, $p < .001$). Trust ($\beta = 0.19$, $p < .01$) and Perceived Organizational Support ($\beta = 0.18$, $p < .05$) contribute additional explanatory power, jointly accounting for 64.5% of variance. However, moderate mean legitimacy levels ($M = 2.81/5$) suggest compliance without full experiential endorsement. The study contributes to mandatory technology theory by (a) operationalizing legitimacy as a distinct evaluative outcome under coercion. (b) Demonstrating the primacy of usability in shaping system legitimacy. (c) Providing the first empirical evidence from Arab public healthcare systems on biometric attendance evaluation. These findings refine the Technology Acceptance Model (TAM) boundary conditions and advance institutional perspectives on governance-driven digital transformation.

Keywords: Biometric attendance systems, perceived usefulness, operational legitimacy, mandatory technology use, institutional theory, public healthcare governance, digital transformation.

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1. Introduction

As the Jordanian Ministry of Health rolled out biometric attendance systems in public hospitals, employees were required to comply. However, mandatory use does not necessarily mean compulsory acceptance. This raises a key question of digital governance: how do employees evaluate technologies they are mandated to use?

This issue becomes especially sensitive in the context of public healthcare. Biometric systems, which use permanent physiological information and integrate pervasive surveillance into routine activities, have the potential to exacerbate concerns regarding privacy, equity, and data management. In professional settings with strong ethical ideals and confidentiality norms, the acceptance of biometric access control will depend not only on its operational utility but also on its perceived legitimacy by staff. The Technology Acceptance Model (TAM) considers user responses toward new information systems to be a function of their perception of the system's usefulness Perceived Usefulness (PU) and ease of use Perceived Ease of Use, (PEOU) that ultimately guides the behavioral intention to use the technology under conditions of voluntary use (Davis, 1989; Venkatesh and Davis, 2000). Although this model has been extended to account for voluntary use as a moderating condition (Venkatesh et al., 2003), PU is still considered a direct determinant of intention. Nevertheless, in a mandatory setting, intention is irrelevant. If staff are obliged to use the system, how should perceived usefulness be interpreted? Institutional theory can also be relevant here. Legitimacy refers to a general perception that the actions of an entity are desirable, proper, or appropriate within some socially constructed system of norms, values, beliefs, and definitions

(Suchman, 1995). In a coercive digital environment, the pragmatic perspective views PU as an indication of pragmatic legitimacy, that is, whether the employees find utility in the use of the system despite it being forced upon them. Instead of reflecting the intention to use the system, the perceived usefulness can be reflective of whether the system is instrumentally legitimate.

This legitimacy perspective applies even more to biometric attendance systems, where surveillance over employees is entwined with their own sensitive body data. Given the apprehensions associated with surveillance, security and fairness, trust and perceived organizational support may play an important role, alongside beliefs about ease and usefulness of the technology, in shaping evaluations. Despite the wide diffusion of biometric systems in public organizations, there have been limited studies concerning: (1) Perceived Usefulness as a dimension of pragmatic legitimacy in mandatory biometric systems. (2) PU in terms of legitimacy in the case of biometric systems rather than traditional PU for adoption purposes. (3) such aspects in the context of Arab public healthcare systems.

Accordingly, this study addresses the following research questions:

To what extent do Perceived Ease of Use, Trust, and Perceived Organizational Support predict the perceived pragmatic legitimacy of mandatory biometric attendance systems in Jordanian public hospitals?

Drawing on TAM and institutional legitimacy theory, four hypotheses are proposed:

H1: Perceived Ease of Use positively predicts perceived pragmatic legitimacy of mandatory biometric attendance systems.

H2: Trust positively predicts perceived pragmatic legitimacy.

H3: Perceived Organizational Support positively predicts perceived pragmatic legitimacy.

H4: Legitimacy-oriented Perceived Usefulness is empirically distinct from traditional adoption-oriented Perceived Usefulness.

The current research combines TAM and institutional legitimacy theory by reconceptualizing the PU construct as a post-coercive evaluation. It validates the discriminant validity of the legitimacy-driven PU, confirms the importance of usability for building its legitimacy, and is the first to experimentally explore the use of mandatory biometric systems in the Jordanian public healthcare sector. Moreover, the discussion on the employees cognitive evaluation of the technology that is imposed on them will help refine the boundaries of TAM while gaining insights into the institutional perspective associated with the governance-driven digital ecosystem transition.

Moreover, by providing insights into the employees mental assessment of forced technology, this research helps refine the boundary conditions for TAM and institutional theory of governance-led digital transformation. However, these insights must be taken into consideration against the backdrop of Jordan's public healthcare system.

While the scope of this empirical study remains confined to public hospitals in Jordan, the theoretical framework of legitimacy-based evaluation in the context of mandated technology usage could prove to have wider applicability in any public sector setting where the coercive use of digital technology takes place, especially within a tightly controlled environment.

2. Literature Review

2.1. Mandatory Technology Use and the Legitimacy Reframing of Perceived Usefulness

Early studies on users technology acceptance processes assumed that users had discretion over the use of the technology. The TAM posits that individuals formulate their behavioral intentions and subsequently adopt new technology based on their PU and PEOU (Davis, 1989; Venkatesh and Davis, 2000). The model assumes individuals have discretion over whether to use the system. Although some versions of TAM models voluntarily use it as a moderator (Venkatesh et al., 2003), PU continues to be conceptualized as linked directly to intention. In organizational contexts, many technologies are mandatory. Studies on mandatory systems have documented the existence of a gap between behavioral compliance and acceptance (Brown et al., 2002). Users comply with the use of a mandated system without necessarily accepting the system at a cognitive level, or at least their use in a mandatory context does not reflect intrinsic evaluations but rather institutional obligation (Khechine et al., 2023). Prior research has documented that the relationships predicted by TAM continue to exist when use is mandated (Venkatesh et al., 2008; Fridkin et al., 2024), but voluntary use produces behavioral consequences moderated by PU and PEOU (Blut et al., 2022; Wu and Du, 2012).

Bagozzi (2007) suggests that whereas TAM over-emphasizes intention, it under-theorizes broader evaluative mechanisms. In a coercive environment where intention is irrelevant, the perceived usefulness of a technology may not lead to use but rather to evaluating whether or not the system is instrumentally justified. This is consistent with institutional theory's emphasis on coercive, normative, and mimetic pressures to organizational practices (DiMaggio and Powell, 1983) and the regulative and cultural-cognitive structures within which they are embedded (Scott, 2014).

Legitimacy is a broadly accepted perception that the actions of an entity are desirable within socially constructed norms and values (Suchman, 1995). One type of legitimacy, pragmatic legitimacy, refers to judgments of practical benefits and self-interest. When technology is mandatory, PU may be a reflection of pragmatic legitimacy, that is, whether employees believe the system forced upon them is justified in practice. Prior institutional information systems research has found that legitimacy pressures influence not only adoption, but evaluation as well (Teo et al., 2003; Deephouse and Suchman, 2008).

Reinterpreting PU as pragmatic legitimacy brings together TAM and institutional theory by considering usefulness to be a judgment under coercion, and not always a predictor of voluntary adoption.

2.2. Biometric Systems as Surveillance-Embedded Governance Technologies

Biometric attendance systems institutionalize surveillance through the monitoring of physiological attributes. Unlike generic enterprise systems, biometric attendance systems embed organizational surveillance in daily practices, enforcing discipline through an immutable body feature. Digital surveillance scholars have highlighted that such monitoring is a crucial aspect of data-driven governance, improving managerial visibility and control (Grisold et al., 2024; Awumey et al., 2024). Algorithmic monitoring may affect perceived autonomy (Schlund and Zitek, 2024; Thompson and Molnar, 2023), while the capturing of behavioral data may impact perceptions of fairness, trust, and accountability (van Zoonen et al., 2025). Such issues are heightened in biometric systems, given the irreversibility of physiological data and amplified sensitivities around data security and misuse.

Such issues are perhaps more pronounced in healthcare institutions, where confidentiality and professional ethics are well entrenched. As a result, the acceptance of biometric monitoring is as much a function of perceptions of institutional integrity and procedural fairness as it is about technical efficacy. Studies of digital transformation in the public sectors of developing countries also emphasize how technological reforms are effective only when they are institutionally embedded and contextually appropriate (Syed et al., 2023; Satispi et al., 2023), and how digital projects are dependent upon political and legitimacy factors (Kalema, 2024). Biometric-based attendance systems can be seen as surveillance-driven modes of governing, which may be evaluated based on criteria such as usability, credibility, and legitimacy.

2.3. Antecedents of Pragmatic Legitimacy in Mandatory Contexts

2.3.1. Perceived ease of use

TAM suggests that PEOU positively influences PU by cognitive easing (Davis, 1989), and this effect has been demonstrated to be robust in a meta-analysis (King and He, 2006). In mandatory settings, this does not necessarily lead to adoption, but it may influence whether users perceive the system as instrumentally justified. In time-pressured and intense workflow healthcare settings, systems that integrate more fluidly may be perceived as pragmatically legitimate, and those that introduce friction or delay could be considered obstructive.

Accordingly:

H1: Perceived Ease of Use positively predicts perceived pragmatic legitimacy (operational usefulness) of mandatory biometric attendance systems.

2.3.2. Trust

Trust, which includes perceptions of the system's reliability, fairness, and transparency (Cho et al., 2025), has been studied in research on algorithmic decision-making in digital decision-making. Studies examining procedural justice and transparency in digital decision-making find that they are positively related to people's acceptance of digital institutions (Ochmann et al., 2024). In the context of surveillance, fairness and data governance may shape legitimacy evaluations beyond questions of mere efficiency.

Since biometric systems require employees to submit their physiological identifiers, assurance in data protection and organizational responsibility is crucial. This assurance is indicative of moral legitimacy, the perception that the system is ethically justified (Killoran et al., 2025). Hence, trust is also hypothesized to have an independent effect on legitimacy-oriented perceived usefulness.

H2: Trust positively predicts perceived pragmatic legitimacy of mandatory biometric attendance systems.

2.3.3. Perceived organizational support

Perceived Organizational Support (POS) captures the employee's perception of the extent to which the organization values their contribution and cares about their well-being. Support and training provided during the implementation of the technology would reduce uncertainty in this process and signal that the organization is concerned about its employees (Venkatesh and Bala, 2008; Gabbiadini et al., 2023). In mandatory settings, POS may lead employees to further believe that the implementation is being accountable, not sanctioned, for reinforcing pragmatic legitimacy.

H3: Perceived Organizational Support positively predicts perceived pragmatic legitimacy.

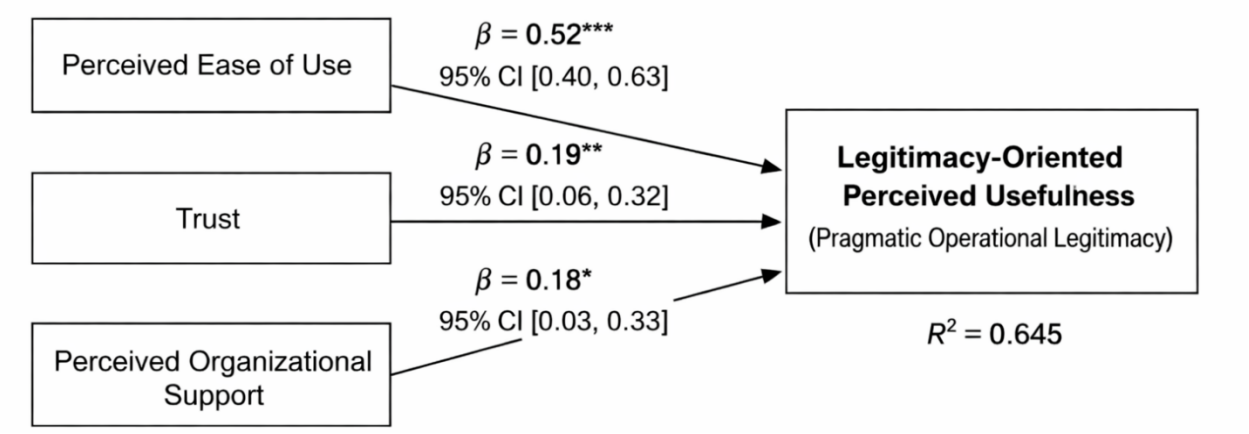
2.4. Conceptual Model and Hypotheses

Based on both the TAM and the theory of institutional legitimacy, the proposed model considers PEOU as a mechanism of pragmatic legitimacy that reduces operational friction. Trust as a mechanism of moral legitimacy indicates our belief and confidence in the governance of data in the system. POS is also an institutional legitimacy signal of perceived support for the system implementation. All have a direct impact on the perceived usefulness, which is redefined as the pragmatic legitimacy of use under coercion.

Since the perceived usefulness is reframed, it should be distinguishable from the traditional adoption-oriented perceived usefulness empirically.

H4: Legitimacy-oriented PU is empirically distinct from traditional adoption-oriented Perceived Usefulness.

Unlike behavioral intention, evaluative legitimacy is adopted as the dependent variable under conditions of mandatory governance. The standardized structural model is presented in Fig. 1.



*Note. ***p < .001; **p < .01; *p < .05. Confidence intervals derived from bootstrapped estimates.*

Fig. 1. Standardized structural model with 95% confidence intervals

PEOU exhibited the strongest association with legitimacy-oriented PU within the estimated model. Prior research has examined technology acceptance in voluntary usage contexts or developed economies, with comparatively limited attention to mandatory settings. Three gaps remain. First, the role of Perceived Usefulness as a dimension of pragmatic legitimacy in mandatory biometric system contexts remains underexplored. Second, existing studies conceptualize PU as an antecedent of adoption intention, with limited distinction between adoption-oriented PU and legitimacy-oriented evaluations under coercive conditions. Third, these issues have received little attention in the context of Arab public healthcare systems, where strong institutional authority, governance-driven digitalization, and sensitivity to surveillance may shape how such technologies are evaluated.

Despite the fact that the study is based in the Jordanian healthcare system, it appears that the theoretical framework employed in studying the legitimacy-based evaluation associated with the forced technology use could also be applicable in other public sector settings where technological solutions are being employed under compulsory circumstances.

3. Methodology

A quantitative cross-sectional survey design was employed to examine employees evaluation of perceptions regarding the mandatory use of a biometric attendance system in public hospitals in Irbid, Jordan, which limits the ability to establish causal relationships between variables. Because system use was mandatory, behavioral intention was not studied. Instead, Perceived Usefulness was reconceptualized as pragmatic legitimacy, defined as employee's perception of the system as practically legitimate in the context of institutional compulsion. The relationships are associative rather than causal, and the findings should be interpreted accordingly. Cognitive interviews conducted with eight healthcare workers in clinical and non-clinical positions indicated that the construct of legitimacy-oriented perceived usefulness exhibited content validity. Participants distinguished between being required to use a system and the system's usefulness in performing their tasks, describing the fit, or lack thereof, in the context of overall workflow and the appropriateness or fairness of the level of expected system use. Changes made to the original TAM PU items to reflect the reorientation towards evaluative legitimacy included eliminating two items and modifying the remaining three.

Data were gathered from three Ministry of Health hospitals in Irbid, where the study's system was simultaneously applied. This workforce included 4,358 employees (MOH, 2024). Participants had to have worked for at least one month and used the system at least once during their job. Thus, the results may be context-specific to Irbid rather than generalizable at a national scale. According to Cochran's formula, the suggested sample size for a population of 4,358 is 354 at 95% confidence and a 5% margin of error. To account for any non-responses, the survey was sent out electronically via official hospital channels in the selected hospitals. 220 valid responses were gathered and used in the analysis.

Measures were adopted from previous studies with appropriate modifications reflecting the nature of legitimacy framing. Since the legitimacy-oriented perceived usefulness construct reflects the evaluative justification of the technology's utility, we also retained the traditional perceived usefulness construct to test for discriminant validity. Perceived ease of use was used to measure how well the technology fits into the users workflow, trust captured aspects such as perceived system reliability, perceived data security, and perceived fairness of the technology, and perceived organizational support captured aspects of the communication and training provided to users regarding the technology. All multi-item constructs used five-point Likert scales. The questionnaire items were translated using a standard forward–backward translation procedure, and a pilot test involving 20 respondents was conducted with minor refinements made to the wording of some items.

The measurement model demonstrated acceptable reliability (α = .89-.95; CR > .85), convergent validity (AVE > .50), and discriminant validity (HTMT = .69-.78). Plus, the two-factor model reflecting legitimacy-oriented and traditional PU fit

significantly better than a single-factor model of PU (HTMT = .72). Nomological validation also indicated these constructs were distinct, with Perceived Ease of Use having a stronger impact on legitimacy-oriented PU.

Common method bias was assessed using Harman's test, a common latent factor model (9.4% variance), and a marker-variable approach, yielding stable structural estimates. Seventeen questionnaires with >20% missing data were excluded, and the remaining missing values (<2%) were estimated with maximum likelihood estimation in AMOS. Structural Equation Modeling was conducted and evaluated with χ^2/df, CFI, RMSEA, and SRMR indices. Robustness checks and multi-group invariance testing confirmed stability.

Ethical approval for this study was granted by the Institutional Review Board at Al-Balqa Applied University on 24 February 2026 and the Research Ethics Committee of the Jordanian Ministry of Health (MOH/REC/2026/70) on 21 January 2026. All applicable national ethical regulations were followed. Participation was voluntary, informed consent was obtained from all respondents, and data were collected anonymously and treated confidentially in accordance with the approved protocol.

4. Results

4.1. Sample Characteristics, Representativeness, and Response Analysis

The adjusted required sample size, calculated using Cochran's formula with the finite population correction, was 354. A total of 220 usable responses were obtained, yielding a response rate of 49.7% relative to the inflated target sample (n = 443).

Table 1 displays demographic characteristics and official Irbid-specific Ministry of Health workforce data (2024) for the sampling frame.

Table 1. Sample characteristics and Irbid population comparison

Variable	Category	Sample (n = 220)	%	Population % (MOH Irbid 2024)	χ^2 (df)	p
Gender	Male	60	27.3	31.0	1.84 (1)	.17
	Female	160	72.7	69.0		
Occupation	Nurses	98	44.5	46.2	0.92 (2)	.63
	Physicians	37	16.8	17.0		
	Administrative	85	38.6	36.8		
Mean Tenure (Years)*		13.05 (SD = 8.29)				

Note: *Tenure calculated from 214 valid responses. Population tenure statistics were not available; therefore, no comparative test was conducted.

No significant differences were observed in gender or occupation group between the population of Irbid hospital workers and those included in the sample, as revealed by chi-square tests. Although the sample included a slight overrepresentation of female workers, this was not significant and reflected the gender distribution of nurses in the Irbid governorate.

Non-response bias was assessed through early–late comparisons of respondents on the focal constructs, with no significant differences observed. Due to the lack of detailed demographic information for non-respondents, it is possible that non-response bias may still be present.

4.2. Descriptive Statistics and Subgroup Comparisons

Descriptive statistics and normality diagnostics are presented in Table 2. All skewness and kurtosis values fall within ±2.0, supporting approximate multivariate normality.

The average legitimacy-focused PU score (M = 2.81) falls below the scale midpoint, suggesting a moderate level of positive evaluation in the context of mandatory compliance. No statistically significant differences were observed across occupational groups in legitimacy-oriented perceived usefulness (F = 2.11, p = .12), although nurses reported a marginally lower mean level of perceived legitimacy (M = 2.73) compared with administrative staff (M = 2.93). Additionally, correlations between the control variables and the focal constructs were weak and statistically non-significant.

4.3. Measurement Model and Discriminant Validity

Confirmatory Factor Analysis supported the hypothesized four-factor model. Fit indices indicated strong model fit: χ^2/df = 2.41, CFI = 0.957, RMSEA = 0.058, SRMR = 0.047.

Alternative models demonstrated inferior fit. A one-factor model showed poor fit (CFI = 0.71, RMSEA = 0.142), and a two-factor model combining institutional constructs yielded CFI = 0.84. The four-factor model significantly outperformed alternatives ($\Delta\chi^2$ significant at $p < .001$).

Table 2. Descriptive statistics and normality

Construct	Mean	SD	Skewness	Kurtosis
Perceived Ease of Use	3.34	0.79	-0.42	0.61
Trust	3.02	0.83	-0.31	0.48
Perceived Organizational Support	2.95	0.91	-0.18	0.37
Legitimacy-Oriented Perceived Usefulness	2.81	0.88	-0.27	0.52

Table 3. Measurement model results

Construct	Loading Range	CR	AVE
PEOU	.74 – .89	0.92	0.66
Trust	.72 – .87	0.91	0.62
POS	.71 – .88	0.93	0.60
Legitimacy-PU	.78 – .91	0.94	0.70

4.3.1. Distinctness of legitimacy-oriented PU

To test Hypothesis 4, legitimacy-PU and traditional adoption-oriented PU were modeled both as separate and combined constructs. The two-factor model demonstrated superior fit (CFI = 0.956) relative to the single-factor model (CFI = 0.82), with a significant chi-square difference ($\Delta\chi^2 = 178.4$, $p < .001$).

The Heterotrait-Monotrait ratio (HTMT) between the two PU constructs was 0.72, with a 95% confidence interval that did not include 1.00, indicating that the constructs share approximately 52% of their variance while remaining empirically distinct.

To further examine distinctness beyond the measurement level, a separate structural model was estimated in which legitimacy-oriented perceived usefulness and traditional perceived usefulness were each predicted by the same set of antecedents. Perceived Ease of Use exhibited a stronger association with legitimacy-oriented perceived usefulness ($\beta = .52$) than with traditional perceived usefulness ($\beta = .38$). In contrast, Trust and Perceived Organizational Support were weakly related and statistically non-significant predictors of traditional perceived usefulness. These nomological differences between the constructs provide additional support for their theoretical distinction within the context of the current study.

4.4. Correlations and HTMT Matrix

Table 4. HTMT matrix

Construct	PEOU	Trust	POS	Legitimacy-PU
PEOU	,	0.73	0.69	0.78
Trust		,	0.76	0.71
POS			,	0.74

All HTMT values were below the conservative threshold of 0.85. The relatively high association between PEOU and PU of 0.78 aligns with prior literature on the Technology Acceptance Model and reflects the theoretical relatedness of these constructs, rather than suggesting redundancy.

4.5. Common Method Bias

The common latent factor accounted for 9.4% of the total variance. The mean difference between the adjusted and unadjusted structural coefficients was 0.07, with no differences exceeding 0.12.

Finally, a theoretically unrelated marker variable was included to evaluate the extent of method inflation. Correlations adjusted using the marker technique remained substantially unchanged, suggesting that common method variance had little effect on our results. Although diagnostics suggest minimal bias, the fact that data were obtained from a single source warrants caution, and associations should be considered potentially inflated.

4.6. Structural Model

The structural model demonstrated acceptable fit: $\chi^2/df = 2.53$, CFI = 0.951, RMSEA = 0.061, SRMR = 0.052.

Table 5. Structural model results (with and without controls)

Path	β (No Controls)	β (With Controls)	p	f^2
PEOU → PU	0.52	0.50	< .001	0.41
Trust → PU	0.19	0.18	.004	0.06
POS → PU	0.18	0.17	.019	0.05

Note: Perceived Ease of Use exhibited a large effect ($f^2 = 0.41$), whereas Trust ($f^2 = 0.06$) and Perceived Organizational Support ($f^2 = 0.05$) demonstrated small incremental contributions.

Control variables were non-significant and did not materially alter focal path coefficients.

The model accounted for 64.5% of the variance ($R^2 = .645$) in legitimacy-oriented PU within the sample. Excluding Trust reduced the explained variance to 58.2% ($R^2 = .582$), whereas excluding Perceived Organizational Support reduced it to 59.4% ($R^2 = .594$).

4.7. Robustness and Sensitivity Analyses

Table 6. Sensitivity Analyses

Test	Result
Outliers excluded	Coefficients stable
Robust ML estimation	No material change
Marker-variable adjusted model	Stable
Multi-group measurement invariance (configural and metric)	Supported
Trust mediation (bootstrapped)	Not supported
POS moderation	Not supported

Note: Bootstrapped mediation tests failed to reveal indirect effects through Trust. Given the sample size, this study may lack sufficient statistical power to detect small indirect or interaction effects, so insignificant results should be interpreted with caution.

5. Discussion

5.1. Theoretical Contributions

5.1.1 Legitimacy as a distinct evaluative outcome in mandatory contexts

This study advances the body of knowledge in the area of technology acceptance in that it gives a concrete empirical basis for distinguishing legitimacy-based Perceived Usefulness from traditional adoption-based Perceived Usefulness in a mandatory setting. The results of the confirmatory factor analysis suggested that the two constructs had discriminant validity. This indicates that employees distinguish between their beliefs that a system will enhance their work performance and their beliefs that the organization's decision to implement the system on a mandatory basis is justified.

Since Suchman defines legitimacy as a generalized perception or assumption that the actions of an entity are desirable or appropriate within a socially constructed system of norms, legitimacy-oriented Perceived Usefulness (PU) can also be considered a type of pragmatic legitimacy. The employees are not users who may or may not choose to accept the biometric system; this choice is no longer available to them . Instead, they are users who may or may not find the system worthy of their interests and thus are willing to accept it as imposed on them. Instead of reflecting a behavioral intention, PU may capture a sense of evaluative support in a situation of coercion.

In contrast to traditional applications of the Technology Acceptance Model, where perceived usefulness functions as a determinant of voluntary adoption, the present findings indicate that in mandatory settings, the evaluative assessment itself becomes the outcome of interest. This suggests that the belief system may continue to function even when voluntary use is reduced or absent, albeit with a different role within the theory. Studies of mandated technologies may consider evaluative legitimacy as a relevant outcome in itself, rather than solely as a determinant of usage.

5.1.2. The primacy of usability under institutional mandate

The strongest predictor of legitimacy-oriented PU was perceived ease of use (β = 0.52), which is roughly comparable to the meta-analytic effect sizes reported in voluntary TAM studies (King and He, 2006). This suggests that even when an institution is forcing users to adopt the system, the cognitive-effort mechanism appears to play a dominant role.

Such disruption is costly in time-critical hospital settings. Delays caused by authentication, failures in scanning or bottlenecks are all experienced as direct obstructions to the performance of clinical work. When forced to adopt, staff cannot refuse the technology, but they may evaluate it as supportive or obstructive to their work. The strong PEOU-PU correlation suggests that attaining pragmatic legitimacy depends largely on the ability to avoid making trouble in practice. A system that 'fits' into everyday practice is deemed useful even if it's required.

Thus, the theoretical interpretation is adapted to consider the system's institutional context. Legitimacy in a mandatory context may be understood less as an ideological threshold and more as an operational judgment. As long as staff do not experience a negative impact on their performance, they may be more likely to tolerate surveillance systems or management tools, even if they might be deemed illegitimate systems if they were to overtax cognitive and operational resources. In the context of digital innovation driven by governance mandates, usability may represent an important pathway to legitimacy.

5.1.3. The secondary but significant role of trust and organizational support

Trust ($\beta = 0.19$) and Perceived Organizational Support ($\beta = 0.18$) also predicted legitimacy-oriented perceived usefulness, though to a lesser degree. Apparently, institutional integrity and managerial engagement appear to matter, but may not fully compensate for poor technical performance.

Trust covers perceptions of the security, fairness, and reliability of data. Biometric data involves harvesting physiological identifiers, which may provoke concerns about privacy and the extent of surveillance. The salience of trust resonates with recent research that argues that perceptions of privacy risk and the algorithmic transparency shape employee's evaluations of biometric and AI-enabled monitoring technologies (Hamapa et al., 2024; Rukhiran et al., 2023). In a public healthcare context, with strong confidentiality norms and strong expectations of data security, trust may signal moral rather than technocratic notions of defensibility and legitimacy.

The association reflects implementation quality, as communication and training are incorporated into the TAM3 intervention logic (Venkatesh and Bala, 2008) to enhance positive evaluation. While supportive management cannot render a poorly functioning system legitimate, it is significantly less than the effect size observed for usability. Procedural justice, transparency, and legitimacy are important, but ultimately, effectiveness is paramount.

Boundary conditions should be considered. It is possible that in contexts with stronger privacy activism or less labor protection, trust may play a larger role in shaping evaluative outcomes. In the present public healthcare setting with strong institutional authority, it appears that concerns related to usability may play a relatively greater role than surveillance-related concerns in determining pragmatic legitimacy.

5.1.4. Contextual evidence from Arab public healthcare

Based on an empirical investigation of Jordan's public healthcare services, the findings contribute to the still limited body of scholarship on mandatory digital governance in Arab contexts. They align with prior research underscoring the importance of data privacy concerns among nurses in Jordan (Abuhammad et al., 2020) and with evidence highlighting the critical role of interoperability in the adoption of national health information systems (Alsharo et al., 2021).

The findings suggest that although the explanatory power (R^2) is relatively high, the mean legitimacy score is moderate ($M = 2.81$). This suggests that digital governance reforms in developing-country healthcare systems may not yet be fully reflected in their perceived legitimacy, even though the systems are now clear. While institutions enforce compliance, the legitimacy of the system may require time to be reflected in employees' cognitive evaluations. Given that digital transformation is in its early stages, this finding aligns with the probability that although the rationale for systems is clear from an administrative perspective, it may not have been fully internalized in perceptions.

5.2. Alternative Explanations

There are several alternative interpretations. First, the substantial relationship between PEOU and PU may suggest that these constructs are measuring the same underlying beliefs in a halo effect rather than representing a true causal relationship. However, various tests to control for common method bias, including the use of a common latent factor and a marker variable, indicated no serious common method bias. The size of these parameters remained stable across all estimations.

Second, the moderate mean observed for perceived usefulness could be interpreted as a function of measurement error rather than genuine ambivalence. However, evidence from cognitive interviews conducted during the scale development phase suggests otherwise. Participants consistently distinguished between "required use" and "perceived benefit" when reflecting on these constructs, indicating that legitimacy-oriented perceived usefulness captures an evaluative judgment rather than a simple acknowledgment of compliance.

Third, there might be differences in legitimacy perceptions across job positions. However, multi-group analyses comparing nurses and administrative staff showed that all three models were structurally invariant, indicating that all relationships hold across job roles, at least in the hospital where this study was conducted.

5.3. Practical Implications

The following implications are interpretive and derived from observed associations rather than causal relationships.

From the perspective of decision-making in management, the implications suggest possible changes in the assessment and implementation of the required digital systems. Instead of focusing mainly on compliance, managers can shift their attention to ease of use, compatibility with workflows, and the overall user experience when selecting and implementing systems. As regards vendor selection, managers can place greater emphasis not only on technical performance but also on

the issues of usability testing and implementation compatibility. Concerning the implementation process itself, managers can give more importance to training and communication processes as part of ensuring legitimacy perceptions.

System designers should prioritize usability and minimize operational disruptions during system interaction. The biometric terminal could be placed at a logical point of entry to reduce potential bottlenecks. Multiple rounds of usability testing with frontline healthcare workers may be beneficial prior to broader system deployment.

Meeting expectations on transparency regarding biometric data handling is one of the responsibilities of the hospital administrator. This involves ensuring employees are aware of what biometric data is stored, who stores it, for how long, and under what mechanisms to prevent misuse. Training should include live demonstrations of system accuracy and security.

For the digital transformation policymakers working on the Jordan Ministry of Health strategic plan, the policy should be written such that, before the selection of a vendor, the digital transformation program managers must have documented usability and privacy compliance testing. They should also be required to have conducted a phased approach to implementation with pilot programs in selected departments and feedback iterations prior to full deployment. The results indicate that mandating compliance does not ensure legitimacy, and the value in use must be addressed.

This study has several limitations that inform future research. Although discriminant validity supports legitimacy-oriented perceived usefulness as a distinct construct, further validation across sectors and national contexts is needed. First, the cross-sectional nature of the data prevents causal interpretations of the findings, and longitudinal research is needed to assess the impact of usability, transparency, and support on perceived legitimacy over time. Second, the data was collected from a single governorate, and further research is needed on samples collected from multiple public and private hospitals or comparative research from multiple Arab countries to determine the boundary conditions of the results. Third, the model did not account for several key variables, such as the intensity of surveillance or the data privacy concerns, nor did it use any objective measures of behavior (e.g., system logs), which future research should include. Finally, qualitative studies will help advance the theory by investigating how employees perceive legitimacy in mandated digital systems. Future research in any of these directions will enrich our understanding of the development and evolution of legitimacy under coercive institutional mandates.

These interpretations should be considered in light of the cross-sectional design, reliance on self-reported data, and the specific institutional context of the study.

6. Conclusion

As per the findings of this study, despite the fact that an employee-related technological tool is mandated by the organizational context, employee acceptance cannot be assumed despite mandatory use, whether they will consider the enforced technology legitimate or not. Regarding the enforcement of a biometric attendance system in the public hospitals in Jordan, this study shows that TAM constructs are still useful as evaluative constructs, even when there is forced adoption. The variable of ease-of-use was strongly associated with usefulness for legitimacy purposes. Trust and Perceived Organizational Support were also positively associated, though with comparatively smaller effects. The structural model accounted for a notable amount of variance. However, the fact that the mean usefulness scores are moderate indicates that compliance is not always associated with positive ratings.

From a theoretical perspective, this research contributes to the literature by extending the application of the TAM by integrating the legitimacy theory in the context of mandatory technology. It provides empirical support for interpreting PU as an indicator of pragmatic legitimacy in mandatory-use contexts, instead of a predictor of behavioral intentions, when voluntary use is lacking. From an empirical perspective, it provides discriminant validity between legitimacy PU and adoption PU; a distinction that is evidence to the argument that evaluating a technology under coercion is different from evaluating the propensity of adopting technology. From a methodological perspective, this research develops and validates measures adaptations for studying mandatory technology. From a contextual perspective, the study offers empirical data, in the domain of public healthcare in Jordan, that factors related to usability appear to play a comparatively stronger role than trust-related concerns within the variables examined in this study when determining perceptions of legitimacy.

More broadly, these findings contribute to emerging scholarship on digital governance in developing country contexts. As governments turn to fingerprint and biometric monitoring, among other forms of digital oversight, to promote transparency and evidence-based governance, it is critical to understand the perceptual context around mandated technologies. Compliance guarantees usage; legitimacy may contribute to more favorable evaluations beyond mere compliance. Perhaps digital transformation would be more effective if it were not only backed by institutional power but also through mechanisms that conform to professional standards, take into account privacy and equity concerns, and are implemented in ways that inspire trust. Mandating may not be enough for sustainable digital governance by itself; legitimacy can arise where systems exhibit fit, credibility, and transparency in their functioning. Even when enforced top-down, the technology must still prove its worth to those on the ground. A system that works efficiently, a data management institution that acts responsibly, and good administration can affect the perception of legitimacy in any mandated technological interventions. The above findings have to be viewed within the scope of the research methodology employed by this study, which is cross-sectional in nature and relies on self-reported data, as well as within the particular institutional context in which the data were gathered, all of which may shape how the results are interpreted.

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Author Contributions

Alaa Osama Kewan Conceptualization, theoretical framing, methodology, instrument adaptation, validation, formal analysis, investigation, data curation, writing of the original draft, writing of the review and editing, visualization, project administration, ethical approval coordination.

Mohammad Odeh Alshirah Conceptualization, methodology refinement, software (SEM/AMOS analysis support), validation, formal analysis, writing of the review and editing, supervision, technical expertise on digital health systems, critical revision of intellectual content.

All authors have read and approved the final version of the manuscript and agree to be accountable for all aspects of the work.

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Institutional Review Board Statement

Ethical approval was obtained from Al-Balqa Applied University and the Jordanian Ministry of Health Research Ethics Committee (MOH/REC/2026/70). Participation was voluntary, informed consent was obtained, and all data were collected anonymously and handled confidentially in accordance with national ethical standards.

Declaration of Artificial Intelligence (AI) Tools

Minor language and grammar edits were performed using Grammarly. The authors reviewed and take full responsibility for all content.

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