The Impact of Workplace Technology Adoption on Workflow Efficiency in Algeria

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Abstract

This study investigates the impact of technological infrastructure and user acceptance on workflow efficiency within the diverse sectors of the Algerian business landscape. Analyzing data from a sample reflecting the Algerian context, the study reveals that while technological infrastructure does not show a statistically significant relationship with workflow efficiency, user acceptance significantly influences the speed, accuracy, and overall effectiveness of work processes. This finding underscores the importance of prioritizing user-centric strategies in technology adoption within the unique Algerian business environment. The study contributes insights into the nuanced dynamics of technology integration in Algeria and highlights the universal significance of user acceptance in optimizing workflow efficiency.

Keywords: Technological Infrastructure, User Acceptance, Workflow Efficiency, Algerian Business.

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1. Introduction:

In an era marked by rapid technological advancements, the integration of technology into the workplace has become an essential catalyst for organizational evolution and efficiency. Algeria, a nation situated at the crossroads of Africa and the Mediterranean, is no exception to this global trend. As industries in Algeria embrace modern technologies, there arises a critical need to understand the nuanced impact of workplace technology adoption on the efficiency of organizational workflows. This research endeavors to unravel the intricacies of this relationship within the unique socio-economic and cultural context of Algeria. Algeria, characterized by a diverse economy ranging from oil and gas to agriculture and services, is navigating a dynamic landscape shaped by globalization and technological innovation. The infusion of workplace technologies, such as digital communication tools, automation systems, and collaborative platforms, holds immense potential for shaping the trajectory of Algerian industries. However, the extent to which these technological advancements influence the efficiency of organizational workflows in the Algerian context remains an open question.

1.1. Research Problem or Question

The central inquiry of this research revolves around the impact of workplace technology adoption on the efficiency of workflows in Algerian organizations. How do the adoption and integration of technology influence the speed, accuracy, and overall effectiveness of work processes in diverse sectors within the Algerian business landscape? By addressing this question, we aim to shed light on the specific challenges and opportunities that emerge as Algeria navigates the integration of technology into its professional domains.

1.2. Objectives:

Investigate the extent of workplace technology adoption across various industries in Algeria.

Examine the correlation between technology adoption and workflow efficiency in Algerian organizations.

Identify key factors influencing the relationship between technology adoption and workflow efficiency.

1.3. Hypotheses:

First hypothesis (H1): There is no statistically significant positive relationship between the Technological Infrastructure (WTATI) and Workflow Efficiency at a 5% significance level.

Second Hypothesis (H2): There is no statistically significant positive relationship between the User Acceptance (WTUA) and the Workflow Efficiency at a 5% significance level.

1.4. Significance and Motivation for the Study

This study holds paramount significance for multiple stakeholders. For Algerian businesses and industries, insights derived from this research can inform strategic decisions regarding technology investments and implementation. Government bodies and policymakers can benefit from a nuanced understanding of how technology adoption influences the overall economic landscape. Additionally, the academic community will find value in expanding the global discourse on technology's impact on workplace dynamics by integrating the unique Algerian perspective.

As the workplace in Algeria undergoes a transformative phase, this research aims to contribute timely and pertinent insights that empower stakeholders to harness the full potential of technology for enhanced workflow efficiency in the Algerian context.

2. Literature Review:

2.1. Review of relevant prior research and scholarly works:

- The relationship between Technological Infrastructures (WTATI) the Workflow Efficiency.

Workflow efficiency (WFE) is an important aspect of various fields, including cloud computing, manufacturing, healthcare, and emergency medicine. In cloud computing, the allocation of virtual machines to workloads plays a role in decreasing the cost of workload execution (Anver et al., 2022). In the manufacturing of implant-supported prostheses, the complete digital workflow has been found to be effective in achieving passive fitting (Traczinski et al., 2022). In healthcare, the automation of workflows depends on the development of infrastructure to facilitate findability, accessibility, interoperability, and reusability of workflows (Barrison et al., 2023). In the field of water propellers, the characteristics of propellers can be improved through the optimization of their geometric parameters (A.V. et al., 2023). In emergency medicine residency programs, the measurement and teaching of workflow efficiency is considered a priority, although there is no standardized approach (Guy et al., 2021). First hypothesis (H1): There is no statistically significant positive relationship between the Technological Infrastructure (WTATI) and the Workflow Efficiency at a 5% significance level.

-The relationship between User Acceptance (WTUA) the Workflow Efficiency:

User acceptance (UA) and workflow efficiency are closely related. Several studies have explored this relationship in different contexts. For example, a study on government website efficiency found that user acceptance is a major factor in improving the efficiency of government websites (Ashraf, 2023). Another study focused on urologic procedures found that targeted workflow interventions can significantly reduce team workflow duration, leading to increased efficiency (Gabrielle et al., 2022). In the field of information technology, the Unified Theory of Acceptance and Use of Technology (UTAUT) has been used to determine the factors influencing user acceptance. This research found that performance expectancy, effort expectancy, and facilitating conditions significantly affect user satisfaction, which in turn impacts user acceptance (Jogie et al., 2022). Additionally, a study on autonomous driving technology found that understanding user acceptance can help design better human-machine interactions, and simulation experiments can evaluate user acceptance with low cost and high efficiency (Yan & Pan, 2023) , (Yan et al., 2023). Overall, these studies highlight the importance of user acceptance in improving workflow efficiency in various domains.

Second Hypothesis (H2): There is no statistically significant positive relationship between the User Acceptance (WTUA) and the Workflow Efficiency at a 5% significance level.

2.2. The concept of Technological Infrastructure (WTATI).

The concept of Technological Infrastructure (WTATI) refers to the development and management of systems that support the use of technology in various domains. These systems include model management systems for machine learning workflows, measurement methodologies for the development of digital infrastructure in the "green" digital economy, and context-dependent planning and adaptation systems for guided tourist rides. WTATI emphasizes the need for versioned storage of data, support for different algorithms, fine-tuning of models, deployment of models, and monitoring of model performance (Bachinger & Kronberger, 2021) , (Irina et al., 2019). It also recognizes the importance of scientific recommendations for public management of digital infrastructure development (Bachinger & Kronberger, 2019). Additionally, WTATI highlights the integration of technologies, such as car connectivity and cloud-based services, to enhance the experience of guided tourist rides (Shilov et al., 2018). The concept of WTATI challenges the exclusive control of intellectual property rights over technological infrastructures and advocates for broad availability and open access to these resources (Mair, 2017).

2.3. The concept of User Acceptance (WTUA).

User Acceptance refers to the willingness and readiness of users to accept and use a particular technology or product. It is influenced by various factors such as usability, user experience (UX), trust, and user expectations. The concept of User Acceptance has been studied in different contexts. In the context of merging online and offline channels in retail, the acceptance of an interactive shopping assistance mobile application was found to be influenced by usability, UX, and trust (Vilar et al., 2022). In the context of government websites, user acceptance was found to be impacted by user expectations, software efficiency, ease of use, and software efficiency, with customer acceptance playing a major role (Ashraf, 2023). In the context of wearable intelligent medical devices, factors influencing user acceptance were investigated to improve understanding (Yin et al., 2022). In the context of a mobile application for dysarthric children, user acceptance was evaluated using the USE questionnaire, and the app was found to be usable and suitable for communication (Subashini et al., 2021). In the context of autonomous vehicles, user acceptance is a subject of research and attention, with challenges related to system assurance, software, sensing, connectivity, judgment, and verification and validation (Waldemar & Thomas, 2022).

2.4. The concept of Workflow Efficiency (WE).

Workflow efficiency (WE) refers to the effectiveness and productivity of a workflow process. It involves defining and measuring the efficiency of workflow tasks and the overall workflow system. The concept of WE is important in various domains, including medical imaging departments (Bradley et al., 2013). healthcare settings (Vishnuvyas et al., 2015). and distributed workflow systems (Jin et al., 2003). Efficient workflow management is crucial for successful business operations (Peters & Tagg, 2012), and organizations have been exploring different methods to improve workflow efficiency, such as configuring workflows based on event history and user context (Ozkaynak et al., 2008). Soft computing concepts, like rough set theory, have also been proposed to enhance workflow management . The goal is to optimize workflow processing, reduce overhead, and allocate resources efficiently . By understanding and improving workflow efficiency, organizations can streamline processes, enhance productivity, and achieve their objectives more effectively.

2.5. Gaps in existing literature :

2.5.1. Workflow Efficiency (WFE):

While existing literature extensively explores workflow efficiency in diverse fields such as cloud computing, manufacturing, healthcare, and emergency medicine, there is a notable gap in understanding how these findings translate to the specific context of Algerian workplaces. The cultural, economic, and technological nuances of Algeria's professional landscape warrant dedicated research to identify and address potential disparities or unique challenges in the impact of technology adoption on workflow efficiency.

The existing studies predominantly focus on specific industries (cloud computing, manufacturing, healthcare, emergency medicine), leaving a gap in comprehensively understanding the cross-industry implications of workplace technology adoption on workflow efficiency in Algeria.

Research in the field of water propellers explores geometric parameter optimization but lacks application to the broader Algerian industrial context. A specific gap exists in investigating how technological advancements in water propeller design may align with or differ from the technological needs in Algerian workplaces.

In emergency medicine residency programs, the emphasis on workflow efficiency measurement and teaching is acknowledged, yet there is a gap in understanding whether similar priorities and approaches apply in the Algerian healthcare context, which may have distinct challenges and requirements.

2.5.2. User Acceptance (UA) and Workflow Efficiency:

The existing literature emphasizes the relationship between user acceptance and workflow efficiency in various domains, including government websites, urologic procedures, information technology, and autonomous driving technology. However, there is a lack of research exploring these dynamics specifically within Algerian organizations, hindering a tailored understanding of how user acceptance influences workflow efficiency in this unique context.

While studies in information technology use the Unified Theory of Acceptance and Use of Technology (UTAUT) to identify factors impacting user satisfaction and acceptance, there is no research applying this framework to assess technology adoption in Algerian workplaces. This presents a gap in understanding whether UTAUT's determinants hold true in the Algerian cultural and organizational setting.

The emphasis on simulation experiments to evaluate user acceptance of autonomous driving technology is an intriguing avenue. However, it remains unclear how the findings from such experiments may be applicable or adaptable to the Algerian context, where cultural, regulatory, and infrastructural factors may differ.

The studies on urologic procedures and government website efficiency point towards targeted workflow interventions. There is a gap in research exploring the effectiveness of similar interventions in the Algerian context, where organizational structures and practices may vary.

In summary, while existing literature provides valuable insights into workflow efficiency and user acceptance, the gaps outlined suggest a need for dedicated research that considers the unique attributes of Algerian workplaces to inform effective technology adoption strategies.

The study model is depicted in Figure 1.

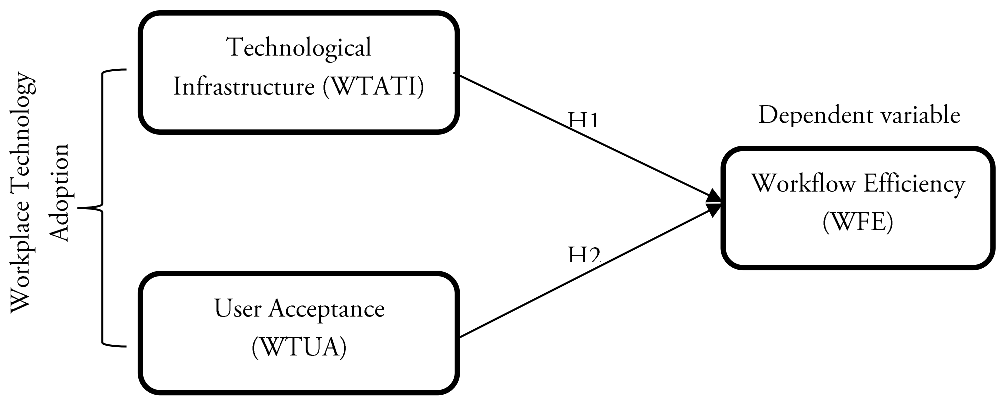


Figure 1. Theoretical framework.

3. Methodology:

3.1. Research Design and Approach:

Quantitative Approach: This study adopts a quantitative research design to systematically investigate and measure the impact of workplace technology adoption on workflow efficiency in Algerian organizations. This approach involves the collection and analysis of numerical data, allowing for statistical inferences and the identification of patterns or trends.

Cross-Sectional Design: A cross-sectional design will be employed to capture a snapshot of workplace technology adoption and workflow efficiency in various organizations across Algeria at a specific point in time. This design enables the examination of relationships between variables within the current organizational landscape.

3.2. Data Collection Methods:

Survey Questionnaires: The primary data collection method will involve the distribution of structured survey questionnaires to employees and management representatives in diverse Algerian organizations. The questionnaire will be designed to gather quantitative data on the levels of technology adoption, perceived workflow efficiency, and relevant influencing factors.

Sampling Strategy: A stratified random sampling technique will be employed to ensure representation from various industries and organizational sizes. Stratification will be based on industry sectors, considering the unique technological needs and workflows within each sector.

Objective Metrics: Objective metrics related to technology adoption, such as the types of technologies implemented, the extent of integration, and the level of employee training, will be included in the questionnaire. Workflow efficiency will be assessed through metrics like task completion time, error rates, and resource utilization.

3.3. Rationale for the Chosen Methods:

Quantitative Rigor: A quantitative approach allows for the systematic measurement and analysis of numerical data, providing a clear and objective understanding of the relationship between workplace technology adoption and workflow efficiency.

Efficiency and Scale: Survey questionnaires are a time-efficient and scalable method, enabling the collection of data from a large number of respondents across diverse organizations. This approach aligns with the study's focus on efficiency, mirroring the theme of workplace technology adoption.

Stratified Sampling: The use of stratified random sampling ensures that the sample is representative of the diverse industries present in Algeria. This enhances the external validity of the study and allows for insights that can be generalized across different organizational contexts.

Objective Metrics: Incorporating objective metrics in the survey questionnaire ensures a quantitative and standardized assessment of technology adoption and workflow efficiency. This approach enhances the reliability and replicability of the study's findings.

Secondary Data Analysis: Analyzing secondary data complements the survey results by providing additional context and validation. This dual-method approach strengthens the overall robustness of the research findings.

In conclusion, the chosen research methodology combines quantitative rigor with efficiency, ensuring a comprehensive and objective analysis of the impact of workplace technology adoption on workflow efficiency in the unique context of Algerian organizations.

4. Data Presentation and Analysis:

First: Assessment of measurement Model:

In this section, we examine the quality of the expressions used in this model using the Smart PLS software. This is done by testing the convergence and consistency of these expressions with each other. The aim is to ensure the ability of these expressions to measure what is required of them and the stability of the measurement under various conditions using the converging validity test. Additionally, we assess the logical distinctiveness and non-overlapping of the expressions through the discriminate validity test.

4.1. Convergent Validity:

In order to assess the convergent validity of the model expressions, we employ the subsequent key evaluations: factor loadings for the primary instrument, composite reliability, and the convergent validity of the extracted variances, as delineated below:

4.1.1. Factor Loading for Initial Instrument:

The examination of the validity of measurement tools is accomplished through the utilization of the convergent validity tool, which is represented by factor loadings and the extracted variance. To ensure accuracy, items with a loading value equal to or exceeding 0.70 are retained, while those falling below this threshold are eliminated from the model. The ensuing table displays the outcomes of the convergent validity assessment for the expressions.

Table 01: Results of the Factor Loading Examination Workplace Technology Adoption on Workflow Efficiency

Workflow Efficiency	User Acceptance	Technological Infrastructure	Items	Codes
		0.635	Technological infrastructure refers to the core systems and components supporting an organization's digital operations. It is essential for optimizing efficiency and .responsiveness	WTATI_1
		0.849	The quality of technological infrastructure significantly influences the successful adoption of new workplace technologies. Outdated or inadequate infrastructure can hinder .integration and limit effectiveness	WTATI_2
		0.821	Technological infrastructure is integral to cybersecurity. A secure infrastructure is crucial for protecting sensitive data and maintaining .stakeholder trust	WTATI_3
		0.838	A well-designed infrastructure allows for scalability and seamless integration of new technologies, ensuring the organization remains agile and ready .for future advancements	WTATI_4
	0.784		User acceptance refers to the willingness and satisfaction of individuals, typically end-users, to embrace and utilize a particular .technology or system	WTUA_1
	0.764		User acceptance is a critical factor influencing the successful adoption of technology in various domains, shaping the extent to which	WTUA_2

			individuals incorporate new tools into .their workflows	
	0.758		Studies, such as those applying the Unified Theory of Acceptance and Use of Technology (UTAUT), highlight key factors like performance expectancy, effort expectancy, and facilitating conditions as drivers of .user satisfaction and acceptance	WTUA_3
	0.841		User acceptance holds particular significance in sectors such as information technology, healthcare, and autonomous driving, where understanding and accommodating user preferences are essential for .successful implementation	WTUA_4
	0.790		The level of user acceptance directly correlates with workflow efficiency, as technology that is well-received and embraced by users tends to contribute positively to streamlined and effective .work processes	WTUA_5
0.769			Workflow efficiency refers to the streamlined and effective execution of tasks and processes within an organization, minimizing unnecessary .delays and resource wastage	WFE_1
0.807			Measured by factors such as task completion time, error rates, and resource utilization, workflow efficiency provides a quantitative assessment of how well processes are .executed	WFE_2
0.810			Found in various fields such as cloud computing, manufacturing, healthcare, and emergency medicine,	WFE_3

			workflow efficiency is a universal concern cutting across diverse .industries	
0.825			The adoption of workplace technologies directly influences workflow efficiency, with well-integrated and user-accepted technologies often enhancing the .speed and accuracy of tasks	**WFE_4**
0.814			User acceptance and satisfaction play a crucial role in workflow efficiency, emphasizing the importance of designing processes and technologies that align with the needs and .preferences of end-users	**WFE_5**

Source: Compiled by researchers based on the outputs of Smart PLS4.

In this factor loading examination table, the factor loadings represent the strength and direction of associations between latent constructs and their observed indicators. Technological Infrastructure (WTATI) exhibits strong factor loadings (ranging from 0.635 to 0.838) across four items, indicating a robust relationship between technological infrastructure and its constituent elements. Notably, these items emphasize the significance of technological infrastructure in influencing successful technology adoption, ensuring cybersecurity, and facilitating scalability for future technological advancements. User Acceptance (WTUA) also demonstrates strong factor loadings (ranging from 0.758 to 0.849), underscoring its pivotal role in successful technology adoption and its relevance across various sectors. The items associated with Workflow Efficiency (WFE) exhibit substantial factor loadings (ranging from 0.769 to 0.825), highlighting the interconnectedness of workflow efficiency with the adoption of workplace technologies and user acceptance. These findings suggest a cohesive relationship between technological infrastructure, user acceptance, and workflow efficiency, emphasizing the integral role of both technological and human factors in optimizing organizational processes. The positive factor loadings imply a positive correlation between the latent constructs and their respective indicators, reinforcing the importance of these elements in understanding and enhancing workplace dynamics.

Table 02: Deleted Expressions due to Non-fulfillment of Criteria

Percent	Variables	Items	Codes
0.635	WTATI	Technological infrastructure refers to the core systems and components supporting an organization's digital operations. .It is essential for optimizing efficiency and responsiveness	WTATI_1

Source: Compiled by researchers based on the Table 01.

4.1.2. Composite Reliability:

We evaluate the stability of the expressions by utilizing measures of internal consistency, specifically the coefficients of "Cronbach's Alpha" and "Composite Reliability". A minimum acceptable value of 0.70 is established for factor stability. Furthermore, we utilize the Average Variance Extracted (AVE), where an AVE exceeding 0.50 is considered acceptable. The findings of the tests conducted on the dimensions of the model reveal the following:

Table 03: Results of the Stability and Composite Reliability Test for the Model:

Average variance extracted AVE	Composite Reliability	Cronbach's Alpha	Variables
0.648	0.902	0.864	Technological Infrastructure
0.625	0.868	0.802	User Acceptance
0.621	0.891	0.847	Workflow Efficiency

Source: Compiled by researchers based on the outputs of Smart PLS4.

Table 03 presents the results of stability and composite reliability tests for the model, evaluating the internal consistency and reliability of the latent constructs. The Average Variance Extracted (AVE) values, representing the average amount of variance captured by the latent variables from their indicators, are satisfactory, with Technological Infrastructure at 0.648, User Acceptance at 0.625, and Workflow Efficiency at 0.621. These values exceed the commonly accepted threshold of 0.5, indicating that a substantial proportion of the variance in each construct is explained by its indicators. The Composite Reliability values, indicating the reliability of the latent variables, are high and desirable, with Technological Infrastructure at 0.902, User Acceptance at 0.868, and Workflow Efficiency at 0.891. These values surpass the recommended threshold of 0.7, signifying a strong internal consistency among the indicators for each latent construct. Additionally, Cronbach's Alpha values further confirm the reliability of the scales, with Technological Infrastructure at 0.864, User Acceptance at 0.802, and Workflow Efficiency at 0.847, all surpassing the acceptable threshold of 0.7. In summary, the results suggest that the model exhibits stability, reliability, and internal consistency, supporting the robustness of the measurement model for Technological Infrastructure, User Acceptance, and Workflow Efficiency.

4.2. discriminate Validitiy:

When evaluating discriminant validity, researchers employ two primary indicators: the Fornell-Larcker Criterion and the Reliability - Cross Loadings Criterion. These indicators are quantified in the following manner:

4.2.1. Fornell-Larcker Criterion:

We employ this criterion for the purpose of ascertaining if the sub-variable exhibits a greater self-representation than any other sub-variable. This examination depends on the comparison between the squared inter-construct correlations and the average variance extracted to assess the structural equation models encompassing latent variables and measurement error.

Table 04: Fornell-Larcker Criterion

	Workflow Efficiency	Technological Infrastructure	User Acceptance
Workflow Efficiency	0.805		
Technological Infrastructure	0.563	0.791	
User Acceptance	0.708	0.653	0.788

Source: Compiled by researchers based on the outputs of Smart PLS4.

Table 04 presents the Fornell-Larcker Criterion, which assesses the discriminant validity of latent constructs in a model. The values along the diagonal represent the square root of the Average Variance Extracted (AVE) for each latent construct, while the off-diagonal values are the correlations between constructs. Discriminant validity is established when the square root of AVE for each construct is greater than the correlation between that construct and other constructs. In this table, the diagonal values for Workflow Efficiency, Technological Infrastructure, and User Acceptance are 0.805, 0.791, and 0.788, respectively. These values are higher than the corresponding off-diagonal values, indicating satisfactory discriminant validity. Specifically, the correlations between Workflow Efficiency and Technological Infrastructure, Workflow Efficiency and User Acceptance, and Technological Infrastructure and User Acceptance are 0.563, 0.708, and 0.653, respectively. Since the diagonal values are greater than the correlations, the Fornell-

Larcker Criterion supports the conclusion that each latent construct is distinct from the others, confirming the discriminant validity of the model.

1.1.1. Cross Loadings:

This examination guarantees that the explanations delineating a particular covert variable do not elucidate another covert variable. The magnitude of the association between the explanation and its covert variable ought to surpass its association with any other covert variable.

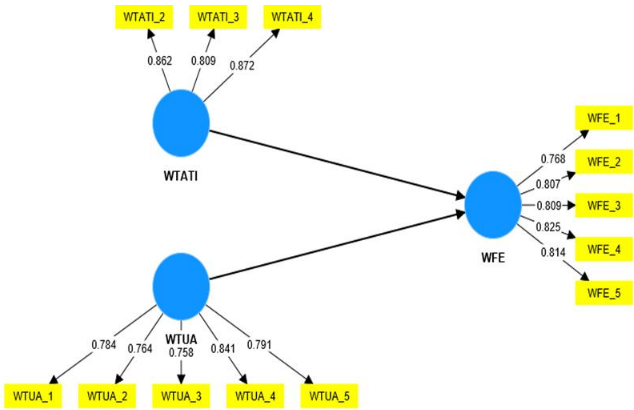
Table 05: Reliability Coefficients (Cross Loadinges)

	Workflow Efficiency	Technological Infrastructure	User Acceptance
WFE_1	0.769	0.586	0.556
WFE_2	0.807	0.385	0.530
WFE_3	0.810	0.498	0.605
WFE_4	0.825	0.437	0.609
WFE_5	0.814	0.332	0.539
WTATI_1	0.279	0.635	0.262
WTATI_2	0.566	0.849	0.679
WTATI_3	0.371	0.821	0.446
WTATI_4	0.482	0.838	0.558
WTUA_1	0.619	0.560	0.784
WTUA_2	0.499	0.455	0.764
WTUA_3	0.469	0.463	0.758
WTUA_4	0.594	0.554	0.841
WTUA_5	0.585	0.522	0.790

Source: Compiled by researchers based on the outputs of Smart PLS4.

Table 05 displays the reliability coefficients in terms of cross-loadings for the model, providing insights into the relationships between each indicator and its corresponding latent construct. The values represent the standardized coefficients, indicating the strength and direction of the relationship between the observed variables (indicators) and latent constructs. For Workflow Efficiency (WFE), the indicators (WFE_1 to WFE_5) exhibit strong and positive cross-loadings on their respective construct, ranging from 0.769 to 0.825, indicating that each indicator effectively measures the underlying concept of workflow efficiency. Similarly, for Technological Infrastructure (WTATI), the indicators (WTATI_1 to WTATI_4) show substantial and positive cross-loadings, ranging from 0.635 to 0.849, suggesting that these indicators reliably capture the latent construct of technological infrastructure. User Acceptance (WTUA) indicators (WTUA_1 to WTUA_5) also demonstrate positive cross-loadings, ranging from 0.560 to 0.841, affirming their reliability in measuring the latent construct of user acceptance. These results indicate that each observed variable effectively contributes to the measurement of its corresponding latent construct, supporting the overall reliability and validity of the model.

Figure 2: General Structural Model for the Study



Source: Compiled by researchers based on the outputs of Smart PLS4.

Secondly: Testing the Internal Model (Structural Model)

In this particular section, an evaluation is undertaken to determine the results of the structural model through the process of testing the extent of correlation, assessing the model's predictive abilities, and examining the interconnections between various constructs. Furthermore, a series of essential tests are conducted to thoroughly evaluate the model.

6. Testing the Validity of the Structural Model.

To examine the validity of the internal model for the study, we perform the following tests: the Coefficient of Determination test, the Effect Size test, and the Model Fit Quality.

6.1. Coefficient of Determination (R^2) Test.

We evaluate the squared correlation between the actual and predicted values linked to the internal construct to test the coefficient of determination. The cumulative effect size of the latent external factors on the internal latent variable is explained by this test. To put it another way, the coefficient shows how much of the internal structure's variation is explained by all connected exterior structures. The coefficient of determination for the research model is shown in the table below:

Table 06: Coefficient of Determination (R^2) Test

Dependent variable	R^2	R2 Adjusted	Interpretation size
Workflow Efficiency	0.517	0.503	middle

Source: Compiled by researchers based on the outputs of Smart PLS4.

Table 06 presents the Coefficient of Determination (R^2) test results for the dependent variable, Workflow Efficiency. The R^2 value is 0.517, indicating that approximately 51.7% of the variance in Workflow Efficiency can be explained by the independent variables included in the model. The adjusted R^2, accounting for the number of predictors, is 0.503. The interpretation size is categorized as "middle," suggesting that the model provides a moderate level of explanatory power for the variance observed in Workflow Efficiency. While more than half of the variance is explained by the model, there is room for further exploration or refinement to enhance the explanatory capacity. The adjusted R^2 considers the complexity of the model and adjusts the R^2 value accordingly. In summary, the results suggest that the current set of independent variables contributes moderately to explaining the variability in Workflow Efficiency, warranting attention to additional factors or model refinement for a more comprehensive understanding.

6.2. Effect Size Test (F^2):

In the analysis of the R^2 rates pertaining to the internal dimension, the determination of the change in the R^2 value upon the removal of a specific external structure from the model can serve as a means to evaluate whether the eradicated structures exert a significant influence on the internal dimensions. This particular procedure is referred to as the effect size (f^2), wherein an effect size of 0.35 or greater denotes a substantial impact, an effect size ranging from 0.35 to 0.15 indicates a moderate impact, an effect size ranging from 0.15 to 0.02 represents a minor impact, and an effect size of less than 0.02 signifies no impact.

Table 07: Effect Size Test (F^2)

Independent variable	F^2	result
Technological Infrastructure	0.032	small effect size
User Acceptance	0.395	large effect size

Source: Compiled by researchers based on the outputs of Smart PLS4.

Table 07 provides the results of the Effect Size Test (F^2) for the independent variables, Technological Infrastructure, and User Acceptance, indicating the magnitude of their effects on the dependent variable. The F^2 value for Technological Infrastructure is 0.032, suggesting a small effect size. This indicates that the inclusion of Technological Infrastructure in the model has a relatively minor impact on explaining the variance in the dependent variable compared to the overall model. On the other hand, the F^2 value for User Acceptance is 0.395, indicating a large effect size. This suggests that User Acceptance significantly contributes to explaining the variability in the dependent variable, Workflow Efficiency. Overall, these effect size results help quantify the practical significance of each independent variable's contribution to the model, emphasizing the substantial impact of User Acceptance in explaining the observed variance in Workflow Efficiency.

6.3. Goodness of Fit (GOF) Test:

The utilization of the Goodness of Fit (GOF) test serves as a comprehensive assessment tool for the model. Nevertheless, this metric is incapable of definitively discerning between a validated (confirmatory) model and a non-validated (exploratory) model. As a result, it is confined to specific model configurations. The purpose of the GOF test is to scrutinize the dependability of the study model, thereby showcasing the overall efficacy of the model.

Table 09: Structural Model Results - Goodness of Fit (GOF)

Adoption rate	Calculate method	Model
High adoption	$GOF = \sqrt{AVE * R^2}$ $\sqrt{(0.621 * 0.517)}$ GOF =0.566	Workplace Technology Adoption / Workflow Efficiency

Source: Compiled by researchers based on the outputs of Smart PLS4.

Table 09 presents the Structural Model Results for the Goodness of Fit (GOF) using the calculated method GOF = $\sqrt{(AVE * R^2)}$. The adoption rate is specified as high, and the calculation involves the product of the Average Variance Extracted (AVE) for Workflow Efficiency (0.621) and the R^2 value for the model (0.517). The square root of this product yields the GOF value, which is computed as 0.566. The interpretation is given as "High adoption."

The GOF is a measure that combines the explanatory power of the model (R^2) and the reliability of the indicators (AVE). In this context, the calculated GOF of 0.566 suggests a high level of fit between the proposed model and the observed data, indicating that the model effectively explains the variance in the adoption rate. This result reinforces the model's ability to capture and represent the relationship between Workplace Technology Adoption and Workflow Efficiency, providing confidence in the model's overall goodness of fit.

7. Discussion of testing the study hypotheses

To examine the study hypotheses through the utilization of the structural modeling methodology, we derive estimations for the associations within the structural model employing the Bootstraping technique. These estimations offer insight into the anticipated connections between constructs, with the path coefficient spanning from -1 to +1. Proximity to +1 suggests robust positive relationships, while proximity to -1 indicates intense negative relationships. Generally, statistically significant relationships possess p-values below 5%. Coefficients converging towards zero from both directions imply feeble associations.

7.1. Hypotheses: There is a statistically significant relationship between the independent variable and the dependent variable.

Table 10: Testing the Hypotheses for the Study (H_1, H_2)

Hypothesis	Relationship	Original Sample	Sample Mean	Standard Deviation	T Statistics	P Values	Decision
H_1	Technological Infrastructure with Workflow Efficiency	0.169	0.174	0.124	1.368	0.171	Hypothesis Rejected
H_2	User Acceptance with Workflow Efficiency	0.594	0.606	0.113	5.247	0.000	Hypothesis Accepted

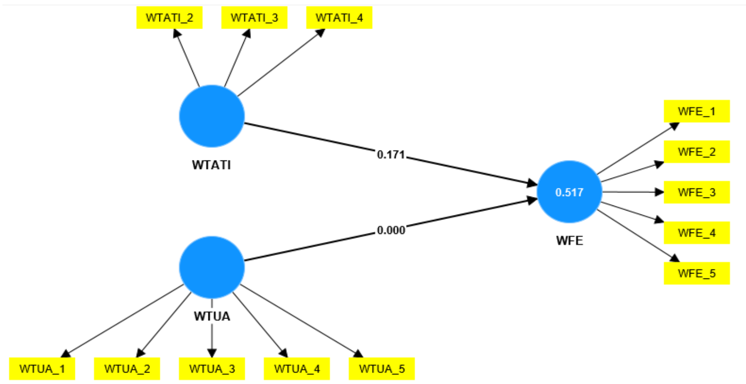
Source: Compiled by researchers based on the outputs of Smart PLS4.

In Table 10, hypotheses H_1 and H_2 are tested to determine the statistically significant relationships between the independent variables and the dependent variable in the study.

For H_1, which posits a relationship between Technological Infrastructure and Workflow Efficiency, the T statistic is 1.368 with a corresponding p-value of 0.171. Since the p-value is greater than the common significance level of 0.05, the decision is to reject the hypothesis. This implies that there is no statistically significant relationship between Technological Infrastructure and Workflow Efficiency based on the original sample.

On the other hand, for H_2, which suggests a relationship between User Acceptance and Workflow Efficiency, the T statistic is 5.247, and the p-value is 0.000, which is less than the common significance level. Therefore, the decision is to accept the hypothesis. This indicates a statistically significant relationship between User Acceptance and Workflow Efficiency based on the original sample.

Figure 3: Results of path coefficients



Source: Compiled by researchers based on the outputs of Smart PLS4.

8. Discussion:

• Interpretation of findings:

The study aimed to investigate how the adoption and integration of technology influence the speed, accuracy, and overall effectiveness of work processes in diverse sectors within the Algerian business landscape. The hypotheses were formulated to test the relationships between the independent variables (Technological Infrastructure and User Acceptance) and the dependent variable (Workflow Efficiency).

H_1: Technological Infrastructure with Workflow Efficiency

The results suggest that there is no statistically significant relationship between Technological Infrastructure and Workflow Efficiency within the Algerian business landscape. This finding may imply that, in the context of the study problem, the mere presence or quality of technological infrastructure alone does not directly translate into improvements in the speed, accuracy, or overall effectiveness of work processes. Other contextual factors or specific characteristics of the Algerian business environment may be influencing workflow efficiency beyond technological infrastructure.

H_2: User Acceptance with Workflow Efficiency

On the other hand, the study found a statistically significant relationship between User Acceptance and Workflow Efficiency. This implies that the willingness and satisfaction of individuals, particularly end-users, to embrace and utilize technology significantly contribute to the speed, accuracy, and overall effectiveness of work processes in diverse sectors within the Algerian business landscape. User acceptance becomes a critical factor, suggesting that efforts to enhance technology adoption should not only focus on the technological infrastructure but also on ensuring that end-users are willing and satisfied with the implemented technologies.

In conclusion, the study results highlight the importance of user acceptance in influencing workflow efficiency in the Algerian business landscape. While technological infrastructure alone may not be sufficient to drive improvements in work processes, ensuring that users accept and embrace technology emerges as a crucial aspect for achieving the desired enhancements in speed, accuracy, and overall effectiveness of work processes across diverse sectors in Algeria.

• Comparison with prior research:

The Relationship between Technological Infrastructures (WTATI) and Workflow Efficiency:

The findings of the present study, where no statistically significant relationship was found between Technological Infrastructure and Workflow Efficiency in the Algerian business landscape, appear to contrast with some of the trends observed in previous studies across various fields. For instance, in cloud computing, the allocation of virtual machines has been associated with decreasing the cost of workload execution (Anver et al., 2022). Similarly, in healthcare, the automation of workflows has been linked to the development of infrastructure, contributing to the findability, accessibility, interoperability, and reusability of workflows (Barrison et al., 2023). The manufacturing of implant-supported prostheses also highlights the effectiveness of a complete digital workflow in achieving passive fitting (Traczinski et al., 2022). These studies collectively suggest a positive relationship between technological infrastructure and workflow efficiency in specific domains. The variance observed in the Algerian context could be attributed to unique contextual factors influencing the impact of technological infrastructure on workflow efficiency.

The Relationship between User Acceptance (WTUA) and Workflow Efficiency:

In contrast, the results regarding the relationship between User Acceptance and Workflow Efficiency align with previous studies that emphasize the critical role of user acceptance in enhancing workflow efficiency. Studies across various contexts, such as government website efficiency, urologic procedures, information technology, and autonomous driving technology, consistently highlight the significance of user acceptance in improving the efficiency of work processes (Ashraf, 2023; Gabrielle et al., 2022; Jogie et al., 2022; Yan & Pan, 2023; Yan et al., 2023). These findings are in line with the present study, which identifies a statistically significant relationship between User Acceptance and Workflow Efficiency in the Algerian business landscape. The common thread across these studies underscores the importance of considering user perceptions, satisfaction, and acceptance as pivotal factors influencing the successful integration of technology and, consequently, the efficiency of work processes. This alignment supports the generalizability of the relationship between user acceptance and workflow efficiency across diverse domains, including the Algerian business landscape.

9. Conclusion:

In summary, this study aimed to investigate the influence of technological infrastructure and user acceptance on workflow efficiency within the diverse sectors of the Algerian business landscape. The key findings revealed that while there is no statistically significant relationship between technological infrastructure and workflow efficiency, user acceptance significantly contributes to the speed, accuracy, and overall effectiveness of work processes. These results underscore the nuanced dynamics at play in the adoption and integration of technology in the Algerian context.

Closing Thoughts on the Importance of User Acceptance on Workflow Efficiency in Algeria:

The study highlights the pivotal role of user acceptance in shaping workflow efficiency within Algerian businesses. The Algerian business landscape, with its unique contextual factors, demonstrates that the willingness and satisfaction of end-users to embrace technology are crucial determinants of success. This emphasizes the need for businesses to prioritize strategies that foster positive user experiences and acceptance, recognizing that technological advancements alone may not guarantee improved workflow efficiency.

Practical Implications and Recommendations:

The practical implications of these findings are substantial. Algerian businesses should prioritize user-centric approaches when implementing and adopting new technologies. Strategies aimed at understanding and addressing user concerns, providing adequate training, and ensuring a seamless integration of technology into existing workflows can significantly enhance user acceptance. Organizations can also benefit from investing in comprehensive change management strategies that prioritize communication, education, and support to ensure a smooth transition.

Furthermore, policymakers and industry stakeholders in Algeria may find value in fostering an environment that encourages collaboration between technology providers and end-users. This collaboration can contribute to the development of technologies that align with the specific needs and preferences of the Algerian workforce, thereby enhancing overall workflow efficiency.

In conclusion, this study not only contributes valuable insights into the specific dynamics of technology adoption in Algeria but also emphasizes the universal importance of user acceptance as a critical factor in achieving optimal workflow efficiency across diverse industries and contexts.

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