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Understanding ICT Adoption Among Entrepreneurs: A Technology Acceptance Model Perspective

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Abstract :

This study aims to evaluate the factors influencing the adoption of Information and Communication Technology (ICT) among entrepreneurs in Ouargla, based on theoretical and applied literature and relying on the Technology Acceptance Model (TAM). A questionnaire was designed and distributed to 312 entrepreneurs in the region. The results showed that all internal and external determinants significantly affect entrepreneurs' acceptance of ICT. Structural Equation Modeling (SEM) results confirmed that government support has a strong impact on both perceived usefulness and perceived ease of use, while ease of use influences perceived usefulness, which in turn affects behavioral intention leading to actual ICT usage. The findings also revealed varying levels of influence for other determinants, such as risk, reliability, and attitude toward usage.

Keywords: (ICT), Technology Acceptance Model (TAM), Entrepreneur, Perceived Ease of Use, Perceived Usefulness

JEL Classification : M13, O14, M40

Introduction:

Algeria has a longstanding history of investing in technological development, beginning in the 1970s with a series of national reforms and strategic plans aimed at improving its international standing in the field of Information and Communication Technologies (ICT). Despite these efforts, the adoption and effective use of ICT by entrepreneurs remain limited, with significant disparities observed across geographic regions and between small and large enterprises. These gaps suggest the presence of

structural, organizational, and contextual barriers that hinder the integration of digital technologies into entrepreneurial activities.

Understanding the factors that influence ICT adoption among entrepreneurs is therefore crucial for enhancing both business efficiency and economic development. The Technology Acceptance Model (TAM) provides a suitable theoretical framework for this purpose, as it explains technology adoption through two main constructs: perceived usefulness the degree to which a technology enhances performance and perceived ease of use the degree to which a technology is user-friendly and requires minimal effort. These perceptions are shaped by internal and external determinants, including reliability, efficiency, government support, perceived risk, and external pressures, which collectively influence entrepreneurs' attitudes, behavioral intentions, and actual use of ICT.

Against this backdrop, the present study aims to identify and analyze the determinants affecting ICT adoption among entrepreneurs in Ouargla, Algeria, providing empirical insights into how both internal and external factors influence technology acceptance and usage in a regional entrepreneurial context. Based on this framework, the following hypotheses are proposed:

1. Reliability has an effect on both perceived ease of use and perceived usefulness among entrepreneurs.
2. Efficiency in using ICT affects perceived ease of use and perceived usefulness.
3. Government support influences perceived ease of use and perceived usefulness.
4. Risk affects perceived ease of use and perceived usefulness.
5. External pressures affect perceived ease of use and perceived usefulness.
6. Perceived ease of use influences perceived usefulness and entrepreneurs' attitudes toward ICT use.
7. Perceived usefulness affects entrepreneurs' attitudes toward ICT and their intention to use it.
8. Attitude toward ICT use influences entrepreneurs' intention and actual use of ICT.

Given the importance of the research topic, multiple research methods were employed, including the deductive approach for formulating the research problem, the inductive approach for establishing the theoretical framework, and the historical approach for reviewing previous literature to identify external determinants, while internal determinants were derived from the TAM. Data was collected using a structured questionnaire.

I. Conceptual Framework of the Study

The Technology Acceptance Model is one of the most prominent frameworks for studying the acceptance and use of ICT, due to its simplicity, accuracy, and ability to explain and predict user behavior. It asserts that technology adoption is directly related to users' perception of its ease of use and usefulness, which ultimately influences their decision to adopt or reject it.

I-1 Beginning and Historical Context:

The Technology Acceptance Model (TAM) was first developed by Fred Davis in December 1985 as part of his doctoral thesis at the Massachusetts Institute of Technology (MIT), USA[1].

I-2 TAM Model:

Davis et al. (1989) developed the model further through experimental studies and introduced external variables as factors influencing individuals' perceptions and behaviors. They also found that the main challenge faced by researchers in the field of information systems management is to understand the reason for technology acceptance or rejection, regardless of the type of technology.

This model can be understood by studying the relationship between perceived external determinants, which in turn influence the user's attitude and intention toward the final decision whether to adopt or reject the technology. This acceptance, for example, could involve the use of electronic devices such as computers, printers, and other systems, and relies on two main determinants: perceived usefulness (PU) and perceived ease of use (PEOU), defined as follows**.**[2] :

- **Perceived Usefulness (PU):** The degree to which a user believes that using a technology will enhance their performance when relying on a system, thereby improving their effectiveness in completing assigned tasks.
- **Perceived Ease of Use (PEOU)**: The degree to which a user believes that using a technological system or device requires minimal effort.

These two main determinants allow the user to form an attitude, which then leads to the actual decision to use or not use the technology. The reliability of this model stems from its ability to explain the usage of any information system, with approximately 40% of changes explained by the relationship between attitude and intention, while actual usage accounts for about 30%.

[1] Henderson, R. and Divett, M.J., 2003. « **Perceived usefulness, ease of use and electronic supermarket use ».** International Journal of Human-Computer Studies, 59(3), Australia, p 384
[2] Davis, F, 1985, Op Cit P 11

Davis explains that external variables (VE), such as system design, hardware, and specific methods of using information technologies, influence the two main determinants PU and PEOU which in turn affect the actual use of technology (AU). In the model:

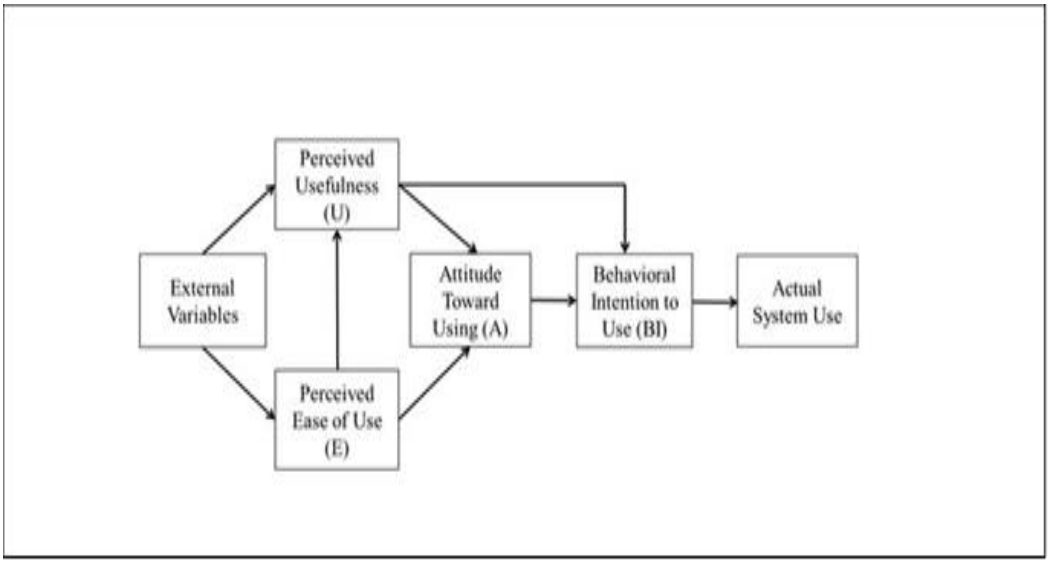
1. Perceived Usefulness (PU) is influenced by Perceived Ease of Use (PEOU) and external variables.
2. Both PU and PEOU influence the attitude toward use (A), representing the user's readiness to engage with the system and predict a certain behavior over time:
3. The attitude toward use (A) then influences the behavioral intention (BI), reflecting the user's perception of the quality of the information systems, which increases their willingness to adopt the system. Additionally, perceived usefulness directly affects behavioral intention

Finally, the cumulative effect of these relationships determines actual usage (AU):

$$\boldsymbol{AU = PU + PEOU + A + BI}$$

This model received recognition from IBM Canada, which signed a contract to design software implementing the TAM model in 1989.

Figure No. (1-1):Technology Acceptance Model



Source: Davis Fred and al, 1989, " User acceptance of computer technology: a comparison of two theoretical Models " , Article, Journal of management science, USA, P 985

I. LITERATURE REVIEW

There are several studies that have focused on identifying external determinants and measuring their impact on internal determinants based on the TAM model. We find the study (Bachtiar, 2019) on 54 women entrepreneurs in Indonesia. Using TAM, the study found trust strongly affects actual ICT use, risk decreases with assistive technologies, and behavioral intention opens new opportunities.

TAM linked external factors to ICT adoption[3]. And we have study (Wiradinata, 2017) on (387 young entrepreneurs in e-marketplaces) where personal traits (intuition, competitiveness) and functional traits (self-efficacy, education) significantly influenced perceived ease of use, usefulness, intention, and actual ICT use[4]. In another hand we find study (Fahriawan, 2020) on **(**234 SMEs in Indonesia (m-commerce). Behavioral intention strongly impacted perceived usefulness; ease of use and availability of devices/networks increased adoption. TAM effectively identified adoption determinants, and we have study (Zaremohzzabieh, 2015) on 400 rural Malaysian entrepreneurs. Perceived ease of use and usefulness strongly predicted adoption; TAM explained 50% of variance in behavioral intention and actual ICT use[5]. Also, we have study of (Oly, 2001) where he study on 472 Malaysian entrepreneurs. TAM reliably predicted technology adoption: support funds and logistical aid enhanced perceived usefulness, ease of use, and behavioral intention[6]**.**

III METHODOLOGY

In the first phase, the structural model of the study was constructed based on the conceptual model derived from the theoretical framework, using Smart PLS v4.0 software, with the aim of testing the model's explanatory and predictive power. This model consists of latent variables representing theoretical constructs, indicators reflecting these variables, and paths or path models illustrating the relationships between them. It includes an outer (measurement) model that measures the relationships between variables and their indicators, and an inner (structural) model that shows the relationships between the latent variables.

This phase also involved testing the reliability and validity of the model by evaluating outer loadings, the average variance extracted (AVE), and composite reliability (CR). Outer loadings were used to measure the degree to which indicators reflect their variables, based on a threshold of 0.708, ensuring the statistical significance and strength of the constructs.

III-1 Analysis of Outer Loadings

The measurement model was assessed by examining the outer loadings of the indicators associated with each latent construct. In accordance with PLS-SEM methodological guidelines, a threshold value of 0.70 was adopted to evaluate indicator reliability, while indicators with loadings between 0.40 and 0.70 were assessed cautiously before removal. As shown the result most indicators recorded outer loadings above the recommended threshold of 0.70, indicating adequate indicator reliability and saturation. Moreover, all indicators exceeded the minimum acceptable level of 0.40,

[3] Suhaeli, D. and Bachtiar, N.K., 2019. Why do (not) woman entrepreneurs jump into technology-based business?. Bizinfo (Blace) Journal of Economics, Management and Informatics, 10(2), pp.95-109.
[4] WIRADINATA, Trianggoro. Nascent entrepreneurs in e-marketplace: the effect of founders' self-efficacy and personality. International Journal of Electronic Business, 2017, vol. 13, no 2-3, p. 163-182.
[5] Zaremohzzabieh, Z., Abu Samah, B., Muhammad, M., Omar, S.Z., Bolong, J., Hassan, M.S. and Mohamed Shaffril, H.A., 2015. A test of the technology acceptance model for understanding the ICT adoption behavior of rural young entrepreneurs. International Journal of Business and Management, 10(2), pp.158-169.
[6] NDUBISI, Nelson O., JANTAN, Muhamad, et RICHARDSON, Stanley. Is the technology acceptance model valid for entrepreneurs? Model testing and examining usage determinants. Asian Academy of Management Journal, 2001, vol. 6, no 2, p. 31-54.

confirming a basic level of measurement reliability. For the construct "ICT Reliability of the Contractor", most indicators demonstrated acceptable loadings ranging from 0.667 to 0.814. However, Reliability 6 showed a relatively low loading (0.555), while Reliability 2 (0.699) and Reliability 4 (0.667) were marginally below the recommended threshold and were therefore carefully evaluated based on their impact on composite reliability and AVE.

The construct "Contractor ICT Competency" exhibited strong outer loadings (0.711–0.888), indicating high internal consistency. Although Competency 7 (0.664) fell slightly below the threshold, it was retained due to the overall robustness of the construction. All indicators of "Government Support for ICT Use" showed high loadings (0.732–0.902), confirming excellent reliability and convergent validity. Similarly, the construct "ICT-Related Risk" demonstrated very strong loadings (0.778–0.969), reflecting a high contribution of indicators to the construct.

Overall, indicators with loadings below 0.70 were gradually removed to enhance the credibility of the structural model, while retaining theoretically relevant indicators within the 0.40–0.70 range, in line with the Technology Acceptance Model (TAM). The rejected indicators mainly belonged to external determinants, including reliability, competency, and external pressure factors.

Conversely, some indicators exhibited loadings below the 0.70 threshold, which necessitated their gradual elimination in order to preserve the credibility of the structural model, while retaining as many indicators as possible within the range [0.40, 0.70], in accordance with the Technology Acceptance Model (TAM).
The results further indicate that the rejected indicators belonged to the external determinants, specifically three indicators related to reliability, one indicator related to competency, and one indicator related to external pressure, due to their weak statistical loading values.

Indicators that did not achieve sufficient levels of saturation were removed, while Reliability indicators (2) and (4) were retained after their loading values increased following the deletion of Reliability indicator (6), which recorded the weakest value. Accordingly, the final measurement model stabilized at 49 reflective indicators representing the study variables.

III-2 **Average Variance Extracted (AVE)**

Average Variance Extracted (AVE) is the second criterion used to assess convergent validity, as it measures the amount of shared variance between a latent construct and its indicators. AVE is calculated as the sum of the squared outer loadings divided by the number of indicators, with an accepted threshold value of 0.50.an AVE value greater than the threshold indicates that the latent construct explains more than half of the variance of its indicators, reflecting an acceptable level of convergent validity and a reliable measurement model. AVE assesses the model's ability to explain variance based on the acceptance threshold (0.50). Values exceeding this threshold imply that the latent construct explains 50% or more of the variance in its indicators, whereas constructs with values below this level should be excluded. Based on the AVE calculations in this study, the results presented in the following table were obtained.

The values reported in the table indicate that all AVE values range between 0.561 and 0.927, exceeding the acceptable threshold of 0.50. This confirms that each latent construct explains more than half of the variance of its indicators. In other words, the average variance of the indicators associated with each construct exceeds the average measurement error variance, indicating that the indicators adequately reflect their respective latent constructs. Consequently, convergent validity is established according to the AVE criterion.

III-3 Internal Consistency Assessment Using Composite Reliability (CR)

Composite Reliability (CR) measures the internal consistency of the indicators of a latent construct based on the outer loading weights. Values greater than 0.70 indicate good internal consistency, while values between 0.60 and 0.70 are considered acceptable in exploratory research. CR values ranging from 0.70 to 0.90 indicate satisfactory reliability, whereas values exceeding 0.95 may suggest unnecessary redundancy among indicators, potentially reducing construct validity.

It should be noted that Cronbach's Alpha is commonly used to measure internal consistency and was employed in this study for descriptive analysis using SPSS v26.0. However, its use in PLS-SEM is limited, as it is sensitive to the number of indicators and assumes equal indicator importance, which may reduce measurement accuracy compared to Composite Reliability.

To evaluate the assessment results, the composite reliability (CR) values are presented in the following results Composite Reliability (CR) was used to assess the internal consistency of the latent constructs in the measurement model. As recommended in PLS-SEM literature, a minimum threshold of **0.70** was adopted to establish satisfactory reliability.

The results indicate that all constructs exhibit strong internal consistency, with CR values ranging from 0.850 to 0.948. Specifically, ICT reliability of the contractor (CR = 0.915), contractor competency in using ICT (CR = 0.928), government support encouraging ICT use (CR = 0.929), risk associated with ICT use (CR = 0.948), and external pressure to use ICT (CR = 0.922) demonstrate excellent reliability.

Similarly, the technology acceptance constructs perceived usefulness (CR = 0.865), perceived ease of use (CR = 0.857), attitude toward ICT use (CR = 0.850), intention to use ICT (CR = 0.947), and actual use of ICT (CR = 0.870)all exceed the recommended threshold, confirming adequate internal consistency.

Overall, the composite reliability results confirm that the measurement model is reliable and suitable for subsequent structural model analysis.

As shown in the result above, all Composite Reliability (CR) values are statistically significant, ranging from 0.850 to 0.948, which is higher than the minimum acceptable threshold of 0.70. This indicates strong internal consistency among the indicators representing the latent constructs, thereby confirming the reliability of the measurement model. Accordingly, it can be concluded that the indicators exhibit good internal consistency and that convergent validity is achieved according to the Composite Reliability criterion.

Moreover, based on the results obtained from the three criteria Outer Loadings, Average Variance Extracted (AVE), and Composite Reliability (CR) it is evident that all indicators are consistent with the latent constructs they reflect and demonstrate a high level of reliability. Therefore, the data used in this study exhibit strong internal consistency, and convergent validity is fully satisfied for the study data

III-4 Discriminant Validity Assessment

A. Cross Loadings

The first method for assessing discriminant validity relies on cross loadings in Partial Least Squares Structural Equation Modeling (PLS-SEM).

This criterion evaluates the loading of each indicator on its corresponding latent construct, with the expectation that the loading on its own construct is higher than its loadings on any other construct. This difference reflects the discriminant capability between constructs, ensuring that each indicator uniquely represents its respective latent construct without significant overlap with other constructs.Below, the cross-loading values for both endogenous and exogenous latent constructs are presented for each indicator, along with a comparison to the loadings on other constructs, as shown in presents the cross-loadings results for the exogenous constructs, which were examined to assess discriminant validity at the indicator level. Discriminate validity is established when each indicator loads more strongly on its associated construct than on any other construct.The results show that all indicators exhibit their highest loading on their respective constructs, confirming adequate discriminant validity. Indicators measuring ICT reliability display strong loadings on the reliability construct (0.735–0.905), which are substantially higher than their loadings on external pressure, risk,

government support, and competency. Similarly, indicators related to contractor competency load highly on the competency construct (0.712–0.901), while their loadings on other constructs remain low or negative. This pattern indicates a clear distinction between competency and the other exogenous variables. For the construct government support, all indicators demonstrate high loadings on their intended construct (0.739–0.902), exceeding cross-loadings on external pressure, risk, competency, and reliability. This confirms that the indicators adequately capture the concept of government support.

Indicators associated with ICT-related risk show very strong loadings on the risk construct (0.777–0.968), with minimal cross-loadings on the remaining constructs, indicating excellent discriminant validity. Finally, indicators measuring external pressure exhibit high loadings on their construct (0.727–0.904), which are consistently higher than their cross-loadings on risk, government support, competency, and reliability. Overall, the cross-loadings results confirm that each indicator is more strongly associated with its respective construct than with others, thereby providing strong evidence of discriminant validity for the exogenous measurement model.

From the results it can be observed that the loadings of each indicator on its respective construct are higher than the loadings on other constructs, which confirms discriminant validity. The ranges of the indicators for each construct are as follows:

1. ICT Reliability of the Contractor: 0.735 – 0.905
2. Contractor Competency in Using ICT: 0.712 – 0.901
3. Government Support for ICT Use: 0.739 – 0.902
4. Risk Associated with ICT Use: 0.777 – 0.968
5. External Pressure Motivating ICT Use: 0.727 – 0.904

These results indicate that each indicator is most strongly associated with its own latent construct, confirming that the indicators discriminate well among the study variables

III-5 Fornell-Larcker Criterion for Discriminant Validity

The previous results presents the correlation matrix of all latent constructs in the model and compares them with the square root of the Average Variance Extracted (AVE) for each construct.

Key observations from the results:

- Reliability (ICT Use): √AVE = 0.826; weakest correlation with Competency = -0.198
- Competency (ICT Use): √AVE = 0.828; weakest correlation with External Pressure = -0.281
- Government Support: √AVE = 0.829; weakest correlation with Perceived Ease of Use = -0.299

- Risk: √AVE = 0.888; weakest correlation with Perceived Benefit = -0.178
- External Pressure: √AVE = 0.816; weakest correlation with Perceived Ease of Use = -0.072

For internal constructs:

- Perceived Benefit: √AVE = 0.749; weakest correlation with Perceived Ease of Use = -0.230
- Perceived Ease of Use: √AVE = 0.904; weakest correlation with Actual Use = -0.093
- Attitude Toward Use: √AVE = 0.809; weakest correlation with Actual Use = 0.197
- Intention to Use: √AVE = 0.963; correlation with Actual Use = 0.788
- Actual Use: √AVE = 0.931

All latent constructs are distinct, with no overlap between constructs and their indicators, confirming discriminant validity.

III-6 **Heterotrait-Monotrait Ratio (HTMT)**

The **HTMT criterion** measures the correlation between latent constructs considering their indicators. It calculates the average of both heterogeneous and homogeneous correlations. For discriminant validity: HTMT values should be **less than 0.90**, with more conservative studies recommending a threshold of 0.85 (Henseler et al., 2015).

- All HTMT values are below 0.85.
- The highest value is 0.813 (Intention to Use → Actual Use)
- The lowest value is 0.061 (Risk → Actual Use)

There is no overlap between indicators of different latent constructs, confirming that each indicator reflects only its associated construct.

III-7 Structural Model Assessment

After confirming the reliability and validity of the measurement model, the structural model can be evaluated using the following criteria:

1. Significance testing (t-values and p-values):
    - Path coefficients are tested at $\alpha = 0.05$.
    - t-values should be greater than 1.96 to confirm significant relationships.
2. Coefficient of determination (R^2):
    - Measures the explained variance and predictive capability of the endogenous constructs.
3. Effect size (f^2):
    - Evaluates the impact of exogenous constructs on endogenous constructs.
4. Predictive relevance (Q^2):

- Assesses the model's predictive capability for all constructs.

5. Goodness-of-Fit (GOF):
    - Determines the model's overall validity and suitability for similar studies.

Preliminary Check: Multicollinearity

- Variance Inflation Factor (VIF) is used to detect multicollinearity.
- Acceptable VIF values: $0.20 < VIF < 5$
- Ensures that each path coefficient represents an independent relationship between two constructs.

IV. RESULTS AND DISCUSSION

1- Assessment of Structurel Model the hypotheses will be tested

The P-Value is 0.026, which is less than the threshold of 0.05, indicating a statistically significant effect between the two variables: reliability and perceived benefit. The t-value for this path was 2.220, which is greater than the critical value of 1.96, confirming statistical significance. The path coefficient (β) was 0.137 (positive), indicating a positive and statistically significant effect. This means that a one-unit change in ICT reliability leads to a change of 0.137 in the perceived benefit. Therefore, we accept the hypothesis that supports the presence of an effect of ICT reliability on its perceived benefit among entrepreneurs at a significant level of 0.05, and accordingly. The P-Value is 0.486, which is much higher than the threshold of 0.05, indicating that there is no statistically significant effect between the variables: reliability and perceived ease of use. The t-value for this path is 0.697, which is less than the critical value of 1.96. Although the path coefficient (β) is 0.036 (positive), the results indicate no statistically significant effect between the two variables. Therefore, we accept the null hypothesis which states that there is no effect of ICT reliability on perceived ease of use among contractors at the 0.05 level. Thus, we accept and reject the hypothesis:

H01: There is a statistically significant effect of ICT reliability on its perceived benefit among entreprenrs and perceived ease of use among entrepreneur.

Based on these findings, we confirm the existence of an effect of ICT reliability among contractors in the Wilaya of Ouargla on perceived benefit. This result is consistent with the study by **(Bachtiar, 2019),** which found a positive effect of trust in technology use on perceived benefits among

companies in Indonesia[7]. It is also consistent with **(Fahma, 2020)** who found a strong positive impact of trust on the adoption of e-payment systems and perceived benefits8 among SMEs.
Furthermore, the current study aligns with **(Jaziri R. &., 2019)** who found that trust in ICT use positively affects contractors' intentions and attitudes in Tunisia[9]. Similarly, **(Al Rahbi, 2017)** concluded that ICT reliability is a key factor in the external environment for SMEs to adopt e-commerce in Oman[10].

On the other hand, the absence of a significant effect of ICT reliability on perceived ease of use is in line with the findings of (Lai, 2013) who found no significant relationship between trust and perceived ease of use in the context of e-booking applications.[11].

1-2. Regarding the variable entrepreneur ' Efficiency in Using ICT:

The P-value is 0.028, which is below the threshold of 0.05, indicating a statistically significant effect between the two variables: contractors' efficiency and perceived benefit. The t-value for this path was 2.202, which exceeds the critical value of 1.96. The path coefficient (β) was estimated at 0.108 and is positive, indicating a positive and statistically significant effect. This means that a one-unit change in perceived benefit results from a change in efficiency by 0.108. Therefore, we accept the hypothesis that supports the existence of a significant effect of contractors' efficiency on their perceived benefit from using ICT, at a significant level of 0.05.

H2: There is a statistically significant effect of entrepreneurs efficiency in using ICT on its perceived benefit and on its perceived ease of use.

These findings are consistent with the study by (Wiradinata, 2017)), which found a direct and positive effect of contractor efficiency on perceived ease of use. However, it differs from that study in

[7] Suhaeli, D., & Bachtiar, N. K. (2019). **"Why do (not) woman entrepreneurs jump into technology based business?".** Bizinfo (Blace) Journal of Economics, Management and Informatics, 10(2), 95-109.
[8] Najib, M., & Fahma, F. (2020). **"Investigating the adoption of digital payment system through an extended technology acceptance model: An insight from the Indonesian small and medium enterprises"**. International Journal on Advanced Science, Engineering and Information Technology, 10(4), 1702-1708.
[9] Jaziri, R., & Miralam, M. (2019). **"Modelling the crowdfunding technology adoption among novice entrepreneurs: an extended TAM model"**. Entrepreneurship and Sustainability Issues, 7(1), 353.
[10] Al Rahbi, H. S. A. (2017). **"Factors influencing social media adoption in small and medium enterprises (SMEs)"** (Doctoral dissertation, Brunel University London).
[11] Lai, Y. H., Huang, H. C., Lu, R. S., & Chang, C. M. (2013). **"The effects of website trust, perceived ease of use, and perceived usefulness on consumers' online booking intention: Evidence from Taiwan B&B sector"**. Life Science Journal, 10(2), 1516-1523.

its rejection of the hypothesis stating there is no effect of efficiency on perceived benefit among contractors entering electronic markets in Indonesia[12].

The current results also align with the findings of (Wiradinata, 2017; Sardar T. J., 2021) who found that efficiency has a direct and positive impact on both perceived benefit and perceived ease of use in the use of information technology, especially in the context of the pandemic13. Moreover, the study aligns with earlier findings by (Ndubisi, 2005), who The findings suggest that contractors' efficiency enhances their inclination to increase the use of technology, particularly when they receive training that improves their computer usage skills..[14]

1.3- Regarding the Government Support Variable:

The P-value is 0.000, which is significantly lower than the threshold of 0.05, indicating a statistically significant effect between the two variables government support and perceived usefulness. Additionally, the t-value for this path is 12.009, which is higher than the critical t-value of 1.96. Given that the path coefficient (β) is 0.663, a positive value, this indicates a significant positive effect. This means that a one-unit change in perceived usefulness originates from a change in government support by 0.663

H3: There is a statistically significant effect of government support for contractors in using ICT on its perceived usefulness and on its perceived ease of use in the Wilaya of Ouargla.

This result is consistent with the study by (Nia, 2019), which confirms that government support plays a fundamental role in encouraging enterprises to adopt ICT in their entrepreneurial projects. However, in Indonesia15, trust was found to be a more influential factor than government support in technology adoption among entrepreneurs.

It also aligns with the study by (Nazir, 2022) who emphasize the important role of government support in motivating contractors to use ICT for innovation and enhancing the efficiency of managers in small and medium-sized enterprises (SMEs).16

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[12] Wiradinata, T. (2017). **"Nascent entrepreneurs in e-marketplace: the effect of founders' self-efficacy and personality"**. International Journal of Electronic Business, 13(2-3), 163-182.
[13] Sardar, T., Jianqiu, Z., Bilal, M., & Syed, N. (2021). **"Impact of ICT on entrepreneurial self-efficacy in emerging economy: Sustaining lock-down during COVID-19 pandemic"**. Human Systems Management, 40(2), 299-314.
[14] Nelson Oly and al 2001 ، Op Cit
[15] Suhaeli, D., & Bachtiar, N. K. (2019).Op Cit.
[16] Nazir, M. A., & Khan, M. R. (2022). **" Identification of roles and factors influencing the adoption of ICTs in the SMEs of Pakistan by using an extended Technology Acceptance Model (TAM) "**. Innovation and Development, 1-27.

Additionally, the study by (Fahriawan, 2020) confirms that government support has a direct and positive effect on the use of ICT by SMEs17.

4. Regarding the Risk variable:

The P-Value is 0.633, which is greater than the threshold 0.05, meaning there is no statistically significant effect between risk and perceived usefulness. t-statistic is 0.487, which is lower than the critical t value of 1.96. path coefficient (β) is 0.023, a negative value. Hence, we conclude that there is no statistically significant relationship between risk and perceived usefulness. We accept the null hypothesis and reject the alternative hypothesis at the 0.05 significance level. The P-Value is 0.000, which is less than the threshold 0.05, indicating a statistically significant effect between risk and perceived ease of use. t-statistic is 20.835, much greater than 1.96. path coefficient (β) is –0.623, a negative value. This indicates there is a significant negative effect: a one-unit increase in risk leads to a –0.623 change in perceived ease of use. Accordingly, we accept the hypothesis that risk has a significant effect on perceived ease of use at the 0.05 significance level Thus we reject the hypothesis:

H3: There is a statistically significant effect of entrepreneur's perceived risk in using ICT on its perceived usefulness and on its perceived ease of use in the Wilaya of Ouargla.

This result is consistent with the study by (Yusoff M. N., 2021), who found a direct effect on perceived ease of use18، (though they found no effect on perceived usefulness). It also aligns with (chafik, 2015), who concluded that risk influences perceived ease of use in adopting e-commerce among Moroccan contractors but did not find an effect on perceived usefulness19. It accords with (Millicient, 2019), who found a negative correlation between perceived ease of use and cyberattacks or data breaches, though their study did not show an effect on perceived usefulness20.

5 Regarding the variable External Pressures:

The P-Value is 0.760, greater than 0.05, so there is no statistically significant effect between external pressures and perceived usefulness. t-value is 0.306, less than 1.96. path coefficient (β) is 0.019.

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17 Fahriawan, M. R. (2020, October). "**Determinant factors of m-commerce adoption by sme in Indonesia: The tam model approach**". In SENABISMA: Prosiding Seminar Nasional Bisnis dan Manajemen (Vol. 5, pp. 37-49).

18 Yusoff, M. N. H. B., Zainol, F. A., Hafifi Ridzuan, R., Ismail, M., & Afthanorhan, A. (2021). **"Psychological traits and intention to use e-commerce among rural micro-entrepreneurs in malaysia"**. Journal of Theoretical and Applied Electronic Commerce Research, 16(5), 1827-1843.

19 Chafik and Asmae, 2015, Op Cit.

20 Millicient and al, (2019)." **Impact of technology adoption and its utilization on SMEs in Ghana**". International Journal of Small and Medium Enterprises, 2(2), 1-13.

Therefore, we conclude that there is no statistically significant effect, accept the null hypothesis, and reject the alternative hypothesis The P-Value is 0.420, larger than 0.05, indicating no statistically significant effect between external pressures and perceived ease of use. t-value is 0.806, lower than 1.96. path coefficient (β) is –0.038 (negative). Thus, we conclude there is no statistically significant effect

H5: There is a statistically significant effect of external pressures from stakeholders on the perceived usefulness of ICT by contractors and on perceived ease of use of ICT (rejected).

Rejecting both hypotheses is consistent with (KHALIL Rhaiem, 2014), who found that networks of suppliers/customers do not influence ICT adoption in SMEs in Canada. However, it contradicts (fahriwan, 2020) who showed external pressures as a key motivator for SMEs in Indonesia to adopt mobile commerce (m-commerce). In the present study, the lack of effect of external pressures may be attributed to the ambiguity in administrative and financial procedures; marketing activities are limited to social media, which are not considered formal. Yet during the pandemic, contractors were allowed to use virtual platforms, electronic marketing, e-payments for transactions and supply, etc.

6-Regarding the Perceived Usefulness variable:

The P-Value is 0.000, which is much lower than 0.05, indicating a statistically significant relationship between perceived usefulness and attitude. t-value is 4.141, greater than 1.96. The path coefficient (β) is 0.255, a positive value.This signals a significant positive effect: a one-unit increase in attitude comes from a 0.255 change in perceived usefulness. Hence, The P-Value is 0.000, much less than 0.05, so there is a statistically significant effect between perceived usefulness and intention to use. t-value is 4.971, above 1.96. path coefficient (β) is 0.446, positive. This shows a significant positive effect: a one-unit change in intention to use comes from a 0.446 change in perceived usefulness we accept:

H6: There is a statistically significant effect of perceived usefulness from ICT use on entrepreneur's attitude toward its use and on perceived usefulness of ICT on entrepreneurs' intention to use it.

This result corresponds with (Davis, 1989), who posited a link between perceived usefulness and attitude toward using any information system. It also aligns with (chafik, 2015)who found that attitude toward e-commerce adoption among Moroccan SMEs is positively influenced by perceived usefulness, and with (Xin, 2022), who observed a positive relation between perceived usefulness of

integrated systems and reactive attitudes in virtual kiosks. Also it matches (Wiradinata, 2017)who found that attitude toward use influences perceived usefulness even among new businesses in virtual markets. And it is consistent in magnitude of effect with (Li, 2021)who observed a shift among students toward using virtual media in entrepreneurial education.

7-**Regarding Perceived Ease of Use:**

The P-Value is 0.000, less than 0.05, indicating a statistically significant effect. t-value is 4.520, greater than 1.96. path coefficient (β) is 0.112, positive. Thus, we reject the null hypothesis and accept the alternative: perceived ease of use affects perceived usefulness positively. The P-Value is 0.000, much lower than 0.05, showing a statistically significant relationship between ease of use and attitude. t-value is 7.543, higher than 1.96. path coefficient (β) is 0.443, positive. This indicates a significant positive effect: a one-unit increase in attitude comes from a 0.443 increase in perceived ease of use. So:

H7: There is a statistically significant effect of perceived ease of use of ICT on its perceived usefulness among contractors in the Wilaya of Ouargla.

This result aligns with (Davis, 1989), which posits that perceived ease of use and perceived usefulness have a positive correlation in any information system usage. It also agrees with (chafik, 2015)and with (sandra, 2020)who, during the COVID-19 period, found that ease of use of technological media positively affected perceived benefits even in restricted real markets. It matches (william, 2019)in showing a strong positive effect of ease of use in empowering emerging firms to maximize perceived benefits of ICT, and aligns with (Farah, 2020), who found a strong effect of ease of use on perceived usefulness of electronic payment systems among SMEs in Indonesia.

8-Regarding Attitude toward Use:

The P-Value is 0.000, much lower than 0.05, indicating a statistically significant effect. The t-value is 3.854, greater than 1.96. path coefficient (β) is 0.230, positive. Thus, there is a significant positive effect: a one-unit increase in intention to use arises from a 0.230 increase in attitude. We accept:

H08: There is a statistically significant effect of contractors' attitude toward ICT use on their intention to use it.

This outcome corresponds to (Davis, 1989) which posits a positive correlation between attitude toward use and intention to use in any information system—though the strength of the effect might differ. It also aligns in acceptance and effect magnitude with (Juris, 2018), who found no strong effect of attitude on intention among students in e-entrepreneurship courses in tourism, and with (Batra, 2015)who indicate that environmental/regulatory constraints affect the orientation of small/medium enterprises in Canada, which in turn influence their intention to use ICT. However, it conflicts with (chafik, 2015)in their study, where they rejected a hypothesis of attitude's effect on intention to use.

1. **Model Predictive Power**

Coefficient of Determination (R^2)

The explanatory power of the structural model was assessed using the coefficient of determination (R^2) and the adjusted R^2 values for the endogenous latent variables. In line with PLS-SEM guidelines, R^2 values of approximately 0.75, 0.50, and 0.25 are considered substantial, moderate, and weak, respectively.

The results indicate that perceived usefulness ($R^2 = 0.537$; adjusted $R^2 = 0.529$) and perceived ease of use ($R^2 = 0.531$; adjusted $R^2 = 0.524$) exhibit moderate explanatory power, suggesting that the model explains more than half of the variance in these constructs.

Similarly, actual use of ICT shows a moderate level of explained variance ($R^2 = 0.620$; adjusted $R^2 = 0.619$), indicating strong predictive capability of the model for actual usage behavior.

In contrast, attitude toward ICT use ($R^2 = 0.209$; adjusted $R^2 = 0.204$) and intention to use ICT ($R^2 = 0.284$; adjusted $R^2 = 0.279$) demonstrate low explanatory power, implying that additional factors not included in the model may influence these constructs.Overall, the R^2 results suggest that the structural model provides adequate explanatory power for key technology acceptance outcomes, particularly perceived usefulness, perceived ease of use, and actual use of ICT. So the structural model has acceptable explanatory power.

2. **C. Goodness-of-Fit (GOF)**

GOF formula: $\sqrt{(\text{average } R^2 \times \text{average AVE})}$

Interpretation:

GOF < 0.1 → poor

$0.10 < GOF < 0.25 \rightarrow$ weak

$0.25 < GOF < 0.36 \rightarrow$ moderate

$GOF > 0.36 \rightarrow$ strong

$GOF = 0.563 \rightarrow$ high predictive fit, indicating the model is highly suitable for prediction.

Conclusuion

Grounded in the Technology Acceptance Model (TAM), this study proposes a set of recommendations aimed at fostering the adoption of Information and Communication Technology (ICT) among entrepreneurs. The Structural Equation Modeling (SEM) results reveal that the proposed structural model achieves an acceptable fit with the empirical data. After implementing the necessary model adjustments using SmartPLS v4.0, the findings confirm the robustness of the model and its suitability for explaining and predicting entrepreneurs' acceptance and use of ICT.

The empirical results indicate that ICT reliability significantly influences perceived usefulness but has no significant effect on perceived ease of use. Entrepreneurs' ICT competence exerts a significant positive effect on both perceived usefulness and perceived ease of use. Likewise, government support plays a crucial role by significantly enhancing both perceived usefulness and perceived ease of use of ICT. In contrast, perceived risk does not significantly affect perceived usefulness, although it significantly influences perceived ease of use. Furthermore, external pressure from stakeholders does not have a significant impact on either perceived usefulness or perceived ease of use.

Consistent with TAM assumptions, perceived usefulness significantly affects entrepreneurs' attitudes toward ICT use as well as their intention to adopt ICT. Perceived ease of use also significantly influences perceived usefulness and attitude toward ICT use. Attitude toward ICT use, in turn, has a significant effect on the intention to use ICT, which ultimately translates into actual ICT usage behavior.

Overall, these findings validate the applicability of the TAM framework in the entrepreneurial context and emphasize the importance of competence development, institutional support, and perceived usefulness in promoting ICT adoption.

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