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Contextual the technological factors that impact the performance of small and medium enterprises (SMEs) in UAE

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A B S T R A C T

The study relied on analyzing the relationship between several factors that represent technological factors (Technology orientation, Utilizing new knowledge Technology Adoption, Knowledge compatibility, Technological capabilities and Technological collaboration) as independent factors and the level of performance as a dependent factor in medium and small-sized companies in the UAE economy. The inferential approach was followed in the study by analyzing the significance of the sampling results that were reached using structural equations based on the Partial Least Squares method (Pls) using the Smart Plus package, which was used to analyze the path between the six factors as independent factors and the performance factor as a dependent factor. The study applied this methodology to a sample of 250 individuals working in medium and small-sized companies in the UAE economy. The study concluded that the most closely related to performance was Technological Collaboration with an effect size of 72.3%. However, the least related factor was Technology orientation, with an effect factor of 34.4%, while the correlation of the other four factors with performance was medium (between 50% and 63%).

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1. Introduction

According to reports from the International Finance Corporation, small and medium-sized companies (SMEs) account for the largest percentage of companies and projects around the world at a rate of ٩٥%, which has made them absorb a large percentage of workers, more than half (about 60%) (Skafi et al., 2020) Because of this expansion, these institutions play an important role in international economies, especially in the economies of developing countries (Putra & Santoso, 2020).

With the continuous and ongoing progress in technology and the digital revolution that accompanied it, (which has been reflected in all aspects of life), the most important of which is the business sector (especially small and medium-sized companies) that have relied on technology effectively in development, innovation, and building their strategies (Henríquez-Calvo et al., 2024).Technological orientation is considered one of the strategic orientations that is likely to affect the performance and innovation of companies as they (the companies) increase their level of response to technological conditions (Al-Ansari et al., 2013). In addition to the technological orientation affecting the performance of medium and small companies, there are many technological factors that affect the performance of companies and institutions at various levels (factors improving the quality of financing and the availability of human capital, factors enhancing public cooperation, research and development tools, etc.) (Kozubikova & Kotaskova, 2019). With the significant increase in the role of small and medium-sized companies (in both developing and advancing countries' economies) (Ilona et al., 2019). Since the economy of the United Arab Emirates is considered one of the economies that has developed clearly during the last two decades (in conjunction with the rapid development of technology and the intensity of technological capital), this study aimed to analyze the role of technological factors in one of the components of this economy (medium and small companies) To demonstrate

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the extent to which it is affected by technological development. The focus was on a number of technological factors to demonstrate the extent of their impact on this component. These factors are (technological orientation, Utilize new knowledge, Knowledge compatibility, Technological capabilities and Technological collaboration).

2. Literature review & hypotheses development

2.1 Literature review

Despite the large number of theoretical studies that have addressed the importance of adopting technology in small and medium-sized companies, there is a gap in the comprehensive and advanced understanding of this importance (Ofoegbu et al., 2013). One of the most important negative consequences of this gap is the limited concepts about technology and its importance in small and medium-sized companies, and most studies have limited themselves to drawing Random charts and maps of the factors and determinants that affect the adoption of technology in these companies (Zamani, 2022).

Small and medium enterprises represent one of the most vibrant and dynamic economic entities, and information technology is of great importance in raising the efficiency and productivity of these companies, which leads to improving their competitive capabilities (Karuppiah et al., 2023). The flexibility of change in customer preferences and trends due to any changes surrounding them causes flexible change in the regulatory environment of companies that meet the needs of these customers, which is considered one of the important conditions for the continuity of these companies (Ali Qalati et al., 2020). The technologies provided by technological factors (Software and various applications) are an essential component of the components that companies rely on to keep pace with these changes by providing relevant parties (such as end customers) with the most important information they need about the company (Kheni et al., 2010). Despite the importance of technology and technological techniques, their use at the level of small and medium-sized companies is considered to be at low levels because a large number of these companies have not adopted deep investment in these technologies despite their widespread availability with the accelerating technological transformation. Previous literature has shown that the percentage of SMEs that optimally benefit from technological innovations, technologies and factors does not exceed 2% (Skafi et al., 2020).

Information technology enhances the performance of small and medium-sized companies if these companies are able to use the ability provided by this technology to raise the efficiency of cost systems and reduce labor turnover rates, thus raising production efficiency and saving cost and time (Darmaki & Jaafar, 2023). Through the study presented by Darmaki & Jaafar (2023) using a cross-sectional research design, in addition to descriptive statistics tools on a sample of 284 questionnaires. Depending on study population represented by small and medium-sized companies in the United Arab Emirates, it was found that the number of these companies reached (151,875 companies) during the period extending from the beginning of June 2020 until the end of August 2021. It has been shown that technological factors affect, along with other factors (particularly organizational), the performance of medium-sized companies, and multilateral artificial intelligence represents one of the most important technological factors that contribute to raising the performance of these companies. The study also explained that the reason for the importance of the technological factor in raising the level of performance is through the means of accuracy it provides in implementing various activities. In a study conducted by Ilona et al. (2019) using Smart PLS on a sample of the Indonesian economy, it was found that the technological context positively and fundamentally affects the performance of medium and small-sized companies. The same study considered that technological factors are among the external factors that must be monitored permanently to track their effects on both the performance and efficiency of business and management of the company. The study also recommended the necessity of absorbing technology when preparing various strategies in the company. The study stated that the use of technological components by small and medium-sized companies in developing their business in Indonesia is largely focused on what technology provides in terms of social media as an important tool in achieving competitive advantage. In a study analyzing the effects of technology on e-commerce to encourage small and medium enterprises in the United Arab Emirates Almtiri & Miah (2019) showed that although e-commerce is developing in the United Arab Emirates at a higher rate than in many other countries. There are many obstacles that prevent adopting this trade effectively and completely in small and medium-sized companies, the most important of these factors. According to the study, electronic commerce (as one of the electronic technologies) is not clearly defined among workers in these companies in the United Arab Emirates, which makes these workers resist the shift to modern technological techniques in developing E-commerce strategies. In a study of Ali Qalati et al. (2020), depending on structural equation modeling for a sample of 423 responses of small and medium enterprises in Pakistan as an example of developing countries, it was found that technology, (along with organization and environment), plays an effective role in the level of performance in small and medium-sized companies, and the social media provided by technology are considered intermediary tools that have an important positive role between technology, Organization and environment, which has a positive impact on the performance of SMEs.

Schilirò (2015) presented a number of suggestions that would contribute to making greater use of technological transformation in small and medium-sized companies in the United Arab Emirates to raise the degree of performance. The most important of these suggestions is giving priority to innovation and entrepreneurship, as innovation is related to work culture. Also, pioneers Businesses in these companies must believe in their effective role in achieving innovation based on technology, which enables them to be open and embark on innovative practices, especially since medium and small companies in the United Arab Emirates possess great potential that enables them to benefit from technological opportunities to achieve innovation.

According to Zamani (2022) the adoption of technology in small and medium-sized companies must be described as dynamic, so that rapid developments and changes are followed over time, and this dynamism requires the integration of emerging technological technologies permanently, taking into account the internal characteristics of each company. Adopting dynamism in the use of technology and emerging technological techniques (such as blockchain technology) would make the process of switching to technology in raising performance and competitive advantage in small and medium-sized companies an easy, simple and more feasible process (Zamani, 2022).

As a result of a previous literature review that addressed the importance of technology and technological transformation in small and medium-sized companies, the importance of this transformation in these important components was revealed, especially in a country like the United Arab Emirates because of its great potential compared to many developing countries. Therefore, the current study adopts an analysis of the importance of technology. On the performance of small and medium-sized companies in the United Arab Emirates by analyzing the impact of some technological factors (Technology orientation, Utilize new knowledge, Technology Adoption, Knowledge compatibility, Technological capabilities, Technological collaboration) on the performance of these companies.

3.2 hypotheses development

The primary objective of the study was expressed through the formulation of the following hypotheses, which represent sub-objectives that serve the general objective of the study. These hypotheses are as follows (and according to the targeted factors to demonstrate their impact on performance):

H_1: *Technology orientation positively influences the performance of SMEs.*

H_2: *Utilizing new knowledge positively influences the performance of SMEs.*

H_3: *Technology Adoption positively influences the performance of SMEs.*

H_4: *Knowledge compatibility positively influences the performance of SMEs.*

H_5: *Technological capabilities positively influence the performance of SMEs.*

H_6: *Technological collaboration positively influences the performance of the SMEs.*

These hypotheses can be expressed within the proposed model with Fig.1 as follows.

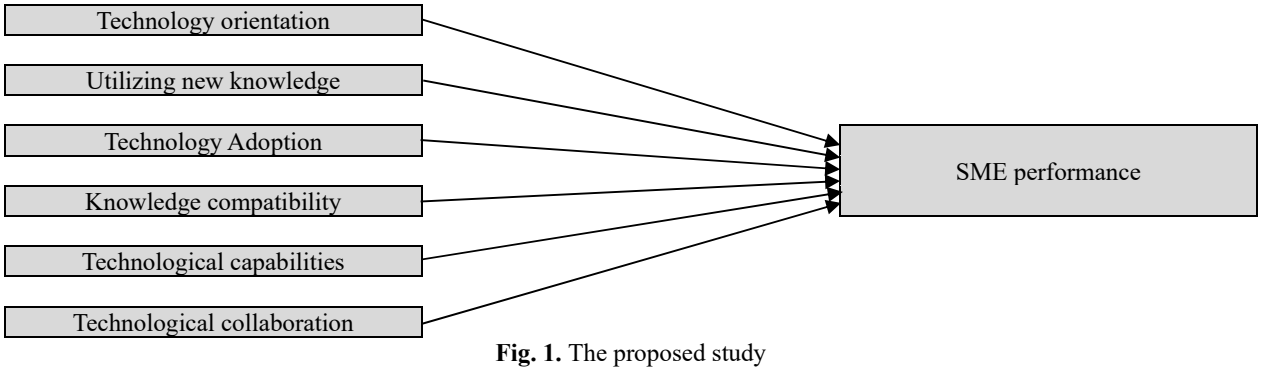

Fig. 1. The proposed study

3. Methodology

To achieve the objectives of the study, we relied on the descriptive approach and the statistical inference approach through primary data obtained using a questionnaire that is distributed to a stratified sample of 250 individuals that represented the responses of employees of a number of small and medium companies in the UAE economy. The sample of companies included companies operating in different sectors in the United Arab Emirates (financial and banking services sector, logistics services sector, manufacturing companies and supply chains). The study included employees from different management levels (lower and middle management positions). The data collection tool was verified through two stages, the first stage by consulting several experts in the fields of administration and statistics, and the second stage is the quantitative verification stage based on tests to verify the validity and credibility of the data based on validity and reliability tests using the Cronbach's Alpha index.

The study questionnaire has been developed based on several research that dealt with the topic or similar topics. The electronic orientation has been proposed through four dimensions, namely Commitment to Change, Commitment to Learning, Management Capability and Technological Capability (Halac, 2015). According to (Allocca & Kessler, 2006; Salavou et al., 2004) electronic orientation consists of five elements related to technology policy, location, and adoption (Al-Ansari et al., 2013). Knowledge utilization is the process of effectively integrating knowledge acquired or transferred during transfer with existing knowledge, generating new knowledge, and improving a company's process or performance. Knowledge was

generally measured through three dimensions (Knowledge acquisition, Knowledge sharing, Knowledge application) and each dimension included a number of statements (Samir, 2020) Perspectives on technology adoption change with the constant change in technological technologies that appear constantly (Zamani, 2022).

The questionnaire included statements measured on a five-point Likert scale, and these statements have been distributed among seven factors (axes), six of which represented independent variables (technological factors), and one of which represented the dependent variable represented by the performance of the medium and small companies that formed the study sample.

4. Data analysis

4.1 Descriptive statistics

Table 1 shows the average answers for each axis (factor) of the seven study factors (mean, upper and lower values, standard deviation and median):

Table 1
Descriptive statistics

Latents	Mean	Median	Min	Max	Standard deviation
t_o	4.487	4.6	2.4	5	0.609
unk	3.277	3.2	1	5	0.912
ta	2.972	3	1	5	1.197
tco	3.312	3.5	1	5	1.108
tca	3.692	3.75	1.5	5	0.857
tcol	3.66	3.75	1.25	5	0.884
pe	3.478	3.5	1.167	5	0.785

Source: by Smart PLs 4 depending on Data.

Note: t_o: Technology orientation, unk: utilizing new knowledge, ta: technology adoption, tco: knowledge compatibility, tca: technological capabilities, tcol: technological collaboration, pe: performance.

Table 1 shows that the average answers of the study sample members to the seven factors were higher than the moderate value (3), except for factor (ta), for which the average answers were equal to the average value (2.97). The highest value appears for the answers (5), which corresponds to the highest value of the five-point scale, while the lowest value differed according to the factor, and the highest was 2.4 for the factor (t_o). It is worth noting that these values are only the average of the answers of the study sample members to the statements corresponding to each of the seven latent factors.

4.2 Hypotheses test

The study was based on testing six hypotheses, each of which tests the significance of the relationship between one of the independent variables (technological factors) and the dependent variable (performance in medium and small companies).

4.2.1 First hypothesis

The first hypothesis tests the relationship between (Technology orientations) as independent (Latent), and performance as dependent (Latent). Fig. 2 shows the value of the effect between the two factors (Technology orientation and performance) with the P-value to test the statistical significance of the size of the effect. As it appears from the figure, the value of the effect reached 0.344 with a positive sign and a value of P-value = 0, which technological orientation positively affects (directly) the level of performance in small and medium-sized companies.

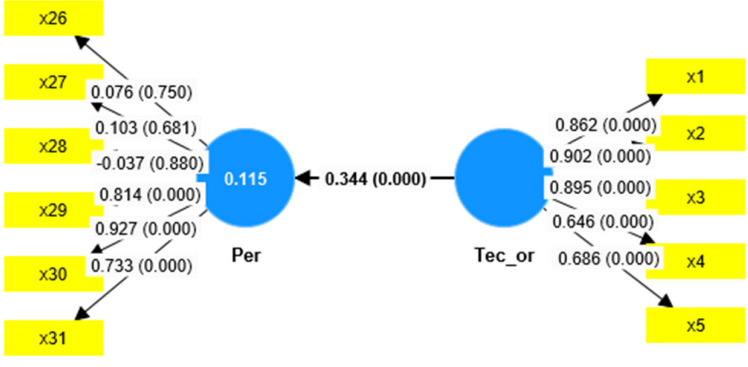

Fig. 2. First Model structure for hypotheses 1

Source: by Smart PLs 4 depending on Data.

The previous chart also shows the loaded values between the variables and the factor associated with it, and through the P-Value it is noted that the variables loaded on Technology Orientation are strongly and significantly related to this factor. As for the variables loaded on performance, only three of them are statistically significantly related to the performance factor (x29, x30, x31)

Model fit

The results of the analysis showed that the adjusted coefficient of determination reached a value of (0.115). This value means that the proposed model enables us to explain only 11.5% of the variance in the performance of small and medium-sized companies in the study population based on the variance in technology orientation; Table 2 shows the tests related to the goodness of fit of the model:

Table 2
First model fit for hypotheses 1

	Saturated model	Estimated model	VFI	Adjusted R- square
SRMR	0.187	0.187		
d_ULS	2.311	2.311		
d_G	0.757	0.757	1	0.115
chi- square	784.472	784.472		
NFI	0.529	0.529		

Source: by Smart PLs 4 depending on Data.

The model test results presented in Table 2 show that the model does not suffer from the problem of multicollinearity. However, the values of other indicators are far from the standard values (NFI < 0.9, d_ULS > 0.08, d_G > 0.1, SRMS > 0.08), so the model must be corrected by deleting the variables that are loaded on the performance factor and that did not show a significant relationship with their factor. These variables are (X26, X27, X28), which express the following expressions:

- My company's customer retention strategy is constantly becoming more effective
- Your company's competitive position in the market is constantly evolving
- Your company introduces innovative practices or products

After deleting these statements and rebuilding the model, the results showed an improvement in the quality of the model fit for most indicators, but the value of the adjusted coefficient of determination decreased slightly to 0.097 and Table 3 shows the results.

Table 3
The second model fit for hypotheses 1

	Saturated model	Estimated model	VFI	Adjusted R- square
SRMR	0.097	0.097		
d_ULS	0.339	0.339		
d_G	0.137	0.137	1	0.097
chi- square	204.774	204.774		
NFI	0.807	0.807		

Source: by Smart PLs 4 depending on Data.

The value of the effect between the technological orientation and performance has decreased to 0.317. Therefore, the correction has caused a change in some indicators and a decline in others, but in both cases the effect caused by the technological orientation on performance is considered a positive and statistically significant effect.

4.2.2 Second hypothesis: The relationship between utilizing new knowledge and the performance of SMEs

The second hypothesis tests the relationship between (Utilize new knowledge) as independent, and performance as dependent (Latent). Fig. 3 presents the results of testing the hypothesis. As we can see, the value of the effect reached 0.597 with a positive sign and a value of P-vale = 0, which means Utilize new knowledge positively affects (directly) the level of performance in small and medium-sized companies.

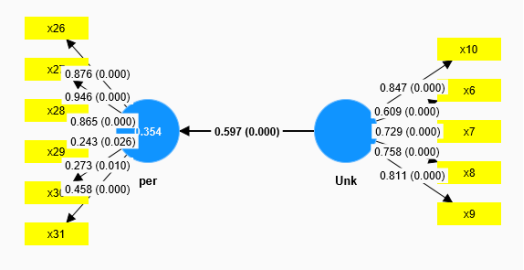

Fig. 3. The first Model structure for hypotheses 2

Fig. 3 shows saturation values between the variables and the factor associated with it. Through the P-Value it is noted that the variables related to utilizing new knowledge are significantly related to this factor. Also, all variables related to performance are significantly related to the performance factor, However, there is a discrepancy in the values of the correlation coefficients between the variables and factors.

Model fit

The results of the analysis showed that the adjusted coefficient of determination reached a value of (0. 354), which means that the proposed model enables us to explain only 35.4% of the variance in the performance of small and medium-sized companies in the study population based on the variance in utilizing new knowledge. Table 4 shows the tests related to the goodness of fit of the model for this hypothesis:

Table 4
The first model fit for hypotheses 2

	Saturated model	Estimated model	VFI	Adjusted R- square
SRMR	0.155	0.155		
d_ULS	1.594	1.594		
d_G	0.472	0.472	1	0.354
chi- square	633.497	633.497		
NFI	0.604	0.604		

Source: by Smart PLs 4 depending on Data.

The model test results presented in the previous table show that the model does not suffer from the problem of multicollinearity. However, the values of other indicators are far from the standard values (NFI < 0.9, d_ULS > 0.08, d_G > 0.1, SRMS > 0.08), so the model must be corrected by removing the variables that are saturated on both factors (performance and the utilizing new knowledge, that did not show a significant relationship with their factor (or with lowest correlations). After removing these statements and rebuilding the model, the results showed an improvement in the quality of the model fit for most indicators, but the value of the adjusted coefficient of determination decreased slightly to 0.097 and the results are summarized in Table 5.

Table 5
The second model fit for hypothesis 2

	Saturated model	**Estimated model**	**VFI**	**Adjusted R- square**
SRMR	0.076	0.076		
d_ULS	0.121	0.121		
d_G	0.073	0.073	1	0.394
Chi- square	113.015	113.015		
NFI	0.875	0.875		

Source: by Smart PLs 4 depending on Data.

Also, the value of the effect between the utilizing the new knowledge and performance has increased to 0.630. Therefore, the correction has caused a positive improvement in most of the indicators presented in Table 5. Anyway, the effect caused by the utilizing new knowledge on performance is considered a positive and statistically significant effect. Fig. 4 presents the summary of the results.

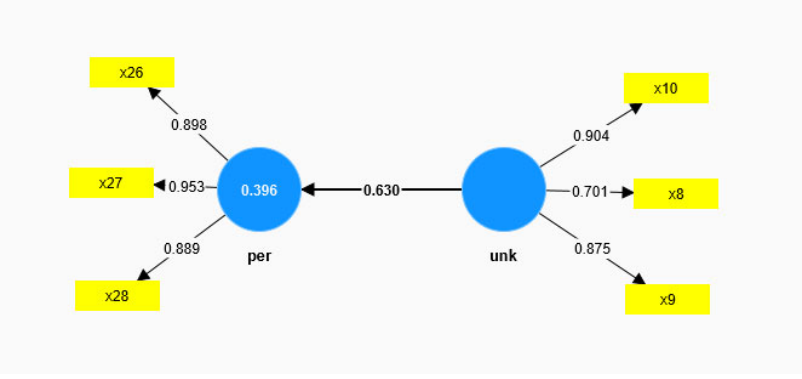

Fig. 4. The summary of the results

Removed variables: (X29, X30, X31 from performance latent) which are:

- The reliability of the products or services provided by your company is constantly increasing

- Your company's data storage capacity is efficient

- Your company's performance has improved over previous years

(x6, x7 from Utilizing new knowledge latent) which are:

- I gain new knowledge from training or professional development in my work.

- I always benefit from new knowledge to solve professional problems while working.

4.2.3 Third hypothesis: The relationship between technology adoption and the performance of the SMEs

The third hypothesis tests the relationship between (Technology Adoption) as independent, and performance as dependent (Latent). The first model (with all variables and two factors) showed results like the previous results in terms of the goodness of model fit. The coefficient of determination showed a relatively high value (0.407). Fig. 5 shows the structural model between two factors (Technology Adoption and performance). As it appears from the graph, the value of the effect reached 0.638 with a positive sign and a value of P-vale = 0, which means Technology Adoption positively affects (directly) the level of performance in small and medium-sized companies.

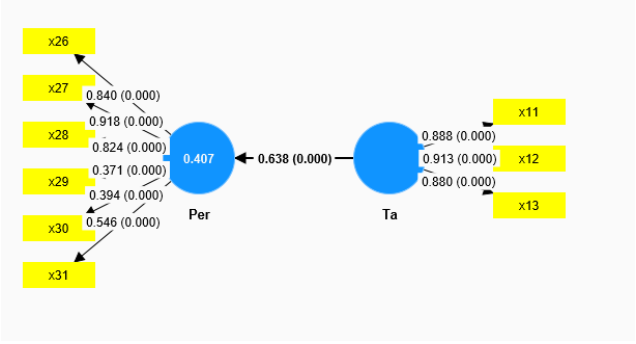

Fig. 5. The first model for testing the third hypothesis

Depending on P-Value, it is noted that the variables related to Technology Adoption are significantly related to this factor, in addition to its high values. In addition, performance indicators show different levels of correlation to performance latent.

Model fit

Adjusted coefficient of determination reached a value of (0. 407), which means that the proposed model enables us to explain about 40.7% of the variance in the performance of small and medium-sized companies in the study population based on the variance in Technology Adoption. The following table shows the tests related to the goodness of fit of the model for this hypothesis:

Table 5
First model fit for testing the third model

	Saturated model	Estimated model	VFI	Adjusted R- square
SRMR	0.15	0.15		
d_ULS	1.014	1.014		
d_G	0.313	0.313	1	0.407
chi- square	421.439	421.439		
NFI	0.694	0.694		

The model test results show that the model does not suffer from the problem of multicollinearity (VFI =1). The values of other indicators are far from the standard values (NFI < 0.9, d_ULS > 0.08, d_G > 0.1, SRMS > 0.08), so the model must be corrected by removing the variables that are saturated on both factors (removing variables with lowest correlations). After removing, the results showed an improvement in the quality of the model fit for all indicators, but the value of the adjusted coefficient of determination decreased slightly to 0.381 (See Table 6).

Table 6
The second model fit for testing hypotheses 3

	Saturated model	Estimated model	VFI	Adjusted R- square
SRMR	0.061	0.061		
d_ULS	0.078	0.078		
d_G	0.081	0.081	1	0.381
chi- square	121.992	121.992		
NFI	0.884	0.884		

Source: by Smart PLs 4 depending on Data.

The value of the effect between the Technology Adoption and performance has decreased to 0.619. Therefore, the correction has caused an improvement in goodness of fit, however it has small negative effects on both correlation and coefficient of determination Table 6. As a result, the effect caused by the Technology Adoption on performance is considered a positive and statistically significant effect. Next diagram illustrates these results (after correction):

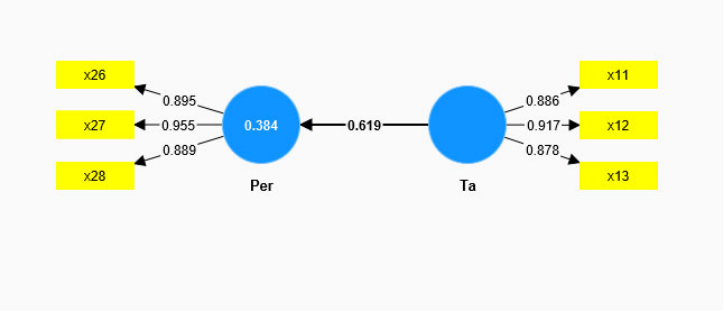

Fig. 6. The results of the modified model

4.2.4 *Fourth hypothesis: The relationship between compatibility and the performance of the SMEs*

The fourth hypothesis tests the relationship between (Knowledge compatibility) as independent, and performance as dependent (Latent). Fig. 7 also shows the results of testing between knowledge compatibility and the performance. The value of the effect reached 0.702 with a positive sign and a value of P-vale = 0, which means Knowledge compatibility positively affects (directly) the level of performance in small and medium-sized companies.

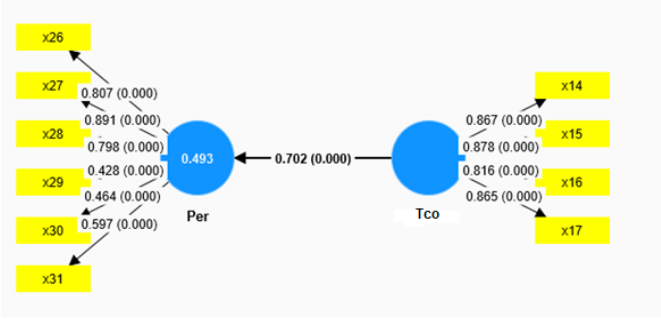

Fig. 7. The first model for testing the fourth hypothesis

All variables that loaded on Knowledge compatibility are significantly related to this factor, in addition to its high values. Also, performance indicators show different levels of correlation to performance latent.

Model fit

Adjusted coefficient of determination reached a value of (0. 491), which means that the proposed model enables us to explain about 49.1% of the variance in the performance of small and medium-sized companies in the study population based on the variance in Knowledge compatibility. The following table shows the tests related to the goodness of fit of the model for this hypothesis:

Table 7
The summary of the first model fit for this hypothesis

H4	Saturated model	Estimated model	VFI	Adjusted R- square
SRMR	0.142	0.142	1	0.491
d_ULS	1.108	1.108		
d_G	0.347	0.347		
chi- square	481.66	481.66		
NFI	0.691	0.691		

The results show that the model does not suffer from the problem of multicollinearity (VFI =1). The values of other indicators are far from the standard so the model must be corrected by removing the variables that are loaded on performance factor (removing variables with lowest correlations). The results showed an improvement in the quality of the model fit for (SRMR, d_ULS, d_G, NFI) indicators, but the value of the adjusted coefficient of determination decreased slightly to 0.422. The following (Table 8):

Table 8
The second model fit for the hypothesis

	Saturated model	Estimated model	VFI	Adjusted R- square
SRMR	0.07	0.07		
d_ULS	0.138	0.138		
d_G	0.091	0.091	1	0.422
chi- square	139.426	139.426		
NFI	0.885	0.885		

The value of the effect between the Knowledge compatibility and performance has decreased to 0.651. Therefore, the correction has caused an improvement in goodness of fit, however it has negative effects on both correlation and coefficient of determination Table 8. As a result, the effect caused by the Knowledge compatibility on performance is considered a positive and statistically significant effect. Next diagram illustrates these results (after correction):

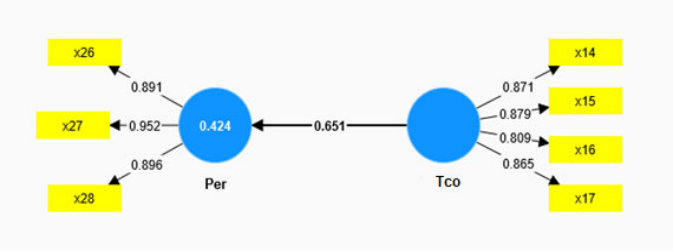

Fig. 8. The results of the testing the fourth hypothesis

4.2.4 Fifth hypothesis: The relationship between technological capabilities and the performance of SMEs

The Fifth hypothesis tests the relationship between (Technological capabilities) as independent, and performance as dependent (Latent). Fig. 9 shows the results of testing the fifth hypothesis. The value of the effect is about 0.655 with a positive sign and a value of P-vale = 0, which means Technological capabilities positively affect (directly) the level of performance in small and medium-sized companies.

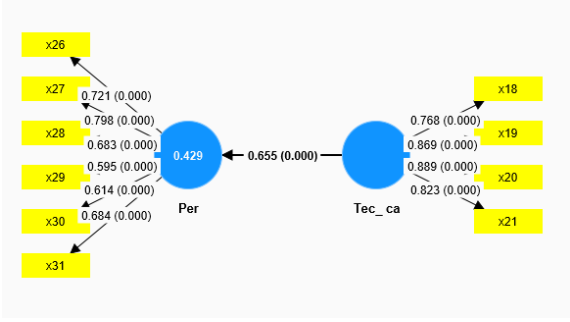

Fig. 9. The first model structure for testing the fifth hypothesis

All variables loaded on Technological capabilities are significantly related to this factor, with high values of correlation. In addition, performance indicators show different levels of correlation to performance latent.

Model fit

Adjusted coefficient of determination value is (0. 429), which means that the proposed model enables us to explain about 42.9% of the variance in the performance of small and medium-sized companies in the study population based on the variance in Technological capabilities. Table 9 shows the tests related to the goodness of fit of the model for this hypothesis.

Table 9
The first model fit for testing the fifth hypothesis

H51	Saturated model	Estimated model	VFI	Adjusted R- square
SRMR	0.153	0.153		
d_ULS	1.286	1.286		
d_G	0.438	0.438	1	0.429
chi- square	614.447	614.447		
NFI	0.587	0.587		

This model does not suffer from the problem of multicollinearity (VFI =1). The values of other indicators are difference from the standard, removing variables with lowest correlations will correct this model and goodness of it. The results show an improvement in the quality of the model fit for (SRMR, d_ULS, d_G, NFI) indicators, but the value of the adjusted coefficient of determination decreased to 0.0.248 (See Table 10).

Table 10
The second model for testing the fifth hypothesis

H52	Saturated model	Estimated model	VFI	Adjusted R- square
SRMR	0.066	0.066		
d_ULS	0.122	0.122		
d_G	0.076	0.076	1	0.248
chi- square	119.198	119.198		
NFI	0.89	0.89		

The value of the effect between the Technological capabilities and performance has decreased to 0.501. Therefore, the correction has caused an improvement in goodness of fit, however it has small negative effects on both correlation and coefficient of determination Table 10. As a result, the effect caused by the Technological capabilities on performance is considered a positive and statistically significant effect. Next diagram illustrates these results after correction:

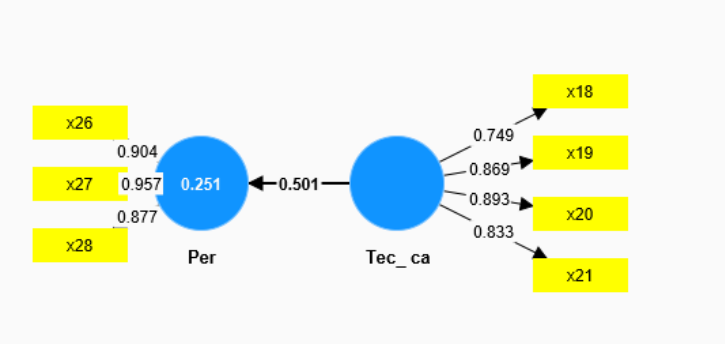

Fig. 10. The second model structure for testing the fifth hypothesis

4.2.5 Sixth hypothesis: The relationship between technological collaboration and the performance of SMEs

The sixth hypothesis tests the relationship between (Technological collaboration) as independent, and performance as dependent (Latent). Fig. 11 shows the results of testing the last hypotheses, (Technological collaboration and performance). The value of the effect is 0.723 with a positive sign and a value of P-vale = 0, which means Technological collaboration positively affects (directly) performance in small and medium-sized companies.

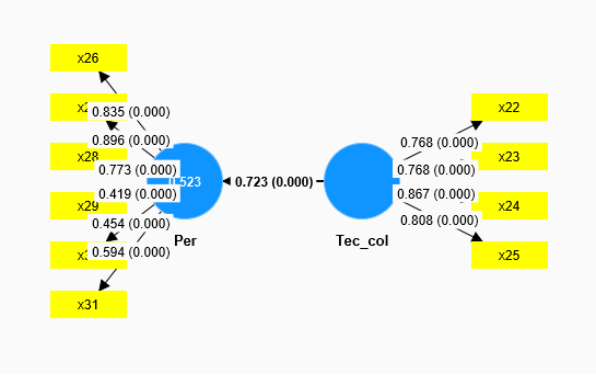

Fig. 11. The summary of testing the last hypothesis of the survey

All variables In Technological collaboration affects in it significantly, with high values of correlation. In addition, performance indicators show different levels of correlation to performance latent.

Model fit

Adjusted coefficient of determination value is (0. 52), which means that the suggested model enables us to explain about 52% of the variance in the performance of small and medium-sized companies in the study population based on the variance Technological collaboration. Table 11 shows the tests related to the goodness of fit of the model for this hypothesis:

Table 11
The model fit for the sixth hypothesis

H61	Saturated model	Estimated model	VFI	Adjusted R- square
SRMR	0.157	0.157		
d_ULS	1.347	1.347		
d_G	0.401	0.401	1	0.521
chi- square	565.802	565.802		
NFI	0.619	0.619		

This model does not suffer from the problem of multicollinearity (VFI =1). The values of other indicators are different from the standard, removing variables with lowest correlations will correct this model and goodness of it. The results have shown an improvement in the quality of the model fit for (SRMR, d_ULS, d_G, NFI) indicators, but the value of the adjusted coefficient of determination decreased to 0.0.248. The following (Table 12):

Table 12
The second model fit for the sixth hypothesis

H52	Saturated model	Estimated model	VFI	Adjusted R- square
SRMR	0.066	0.066		
d_ULS	0.122	0.122		
d_G	0.076	0.076	1	0.248
chi- square	119.198	119.198		
NFI	0.89	0.89		

The value of the effect between the Technological capabilities and performance has decreased to 0.501. Therefore, the correction has caused an improvement in goodness of fit, however it caused negative effects on both correlation and coefficient of determination Table 12. As a result, the effect caused by the Technological capabilities on performance is considered a positive and statistically significant effect. The result of testing the six hypotheses showed that all the factors that were reported to be related to each other showed a significant correlation with variation in both the size of the correlation and the value of the coefficients of determination. The following table summarizes the results of testing these hypotheses:

Table 13
The summary of testing the hypotheses

Hypothesis	Latent	Correlation	Coefficient of determination	P-value for the effect
H1	Technological orientation → SME performance	0.317	0.097	**
H2	Utilize new knowledge → performance	0.63	0.394	**
H3	Technology Adoption → performance	0.619	0.381	**
H4	Knowledge compatibility →performance	0.561	0.422	**
H5	Technological capabilities → performance	0.501	0.248	**
H6	Technological collaboration → performance	0.501	0.248	**

** Sig. < 0.01

5. Results and discussion

5.1 Results

The study concluded that the largest correlation was between the two factors (Utilize new knowledge -- performance), where the value of the correlation coefficient was 0.63, however The lowest correlation was between the two factors (Technology orientation and performance), where the correlation coefficient value was 0.317). The correlation between the factors (Technology Adoption and performance) also showed a good value with a correlation coefficient (0.619), but the other three factors have medium related to performance. The correlation coefficients were between 0.501 and 0.56. It is noted that there is an equal correlation between the level of performance and both of two factors (Technological capabilities and Technological collaboration) with a correlation coefficient value of 0.501.

5.2 discussion

The previous results show that there is a difference in the level of correlation between the technological factors studied as independent latent variables on the one hand and the level of performance in medium and small companies in UAE on the other hand, but the correlation at its best did not exceed 63% (between performance and utilizing new knowledge). The variables loaded on the factors, some of them were statistically significant related, and others were not, which made the models used need to be improved by excluding those variables that do not show high loading degree with their factors. After removing some variables that were slightly related or not statistically significant, the models showed an improvement in model quality indicators. After the development that occurred in the models because of deleting these variables, there remains the possibility of developing these models through depending on other variables that may have a greater impact on each of the six factors (especially the independent factors). It was noted that deleting loaded variables on the factors caused an improvement in the model quality indicators, but it caused a decline in the correlation values and the iron coefficient in many cases.

6. Implications and recommendations

As a result, reached by the study, the relationship between technological factors and the level of performance in UAE's SMEs is not commensurate with the capabilities available in these companies. Therefore, small, and medium-sized companies in the United Arab Emirates must pay greater attention to technological factors, with priority given to the factor (Technology orientation) and then the factors (Technological capabilities and Technological collaboration). It can also enhance the role of the factor (Technology Adoption and Utilize new knowledge) in the level of performance of these companies. The study also recommends that other technological factors be addressed in the study, such as making use of social media, artificial intelligence, or using robots in supporting tasks in these companies, and other factors that can contribute to improving the level of performance by saving effort and time. Several other variables loaded on each of the technological factors examined in the study can be addressed, so that this contributes to further improving the models used. The results of the study can also be expanded to other sectors, even large or very small companies (Micro economic).

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