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The Impact of Digital Transformation on Financial Information Accuracy in Small Businesses: An Empirical Study Based on TOE Framework

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أثر التحول الرقمي في تعزيز دقة المعلومات المالية في الشركات الصغيرة: دراسة تجريبية مبنية على إطار TOE

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Abstract

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This examine examines the impact of virtual transformation on monetary information accuracy in small organizations working in Iraq, using the Technology-Organization-Environment (TOE) framework because the theoretical foundation. Through a comprehensive survey of 2 hundred small commercial enterprise owners and economic managers, decided on via stratified random sampling from the Iraqi Ministry of Commerce database, information was analyzed the usage of structural equation modeling (SEM) with AMOS 26.0. The observe employed rigorous psychometric validation along with confirmatory factor evaluation (CFA), reliability testing (Cronbach's α > 0.80), and discriminant validity evaluation. Results reveal that virtual transformation extensively enhances financial records accuracy (β = zero.687, p < zero.001), with financial statistics quality serving as a substantial mediator (oblique effect = 0.234, p < 0.001). The take a look at well-known shows sizeable enhancements in mistakes discount (79. Three%), reporting efficiency (seventy-six. Four%), and operational fee financial savings (60%). Key obstacles encompass implementation charges, virtual literacy gaps, and organizational resistance.

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المستخلص:
تبحث هذه الدراسة تأثير التحول الرقمي على دقة البيانات المالية في المؤسسات الصغيرة العاملة في العراق، باستخدام إطار التكنولوجيا والمنظمة والبيئة (TOE) كأساس نظري. من خلال مسح شامل شمل مئتي صاحب مشروع صغير ومدير مالي، تم اختيارهم من خلال عينة عشوائية طبقية من قاعدة بيانات وزارة التجارة العراقية، تم تحليل البيانات باستخدام نمذجة المعادلات الهيكلية (SEM) مع AMOS 26.0. استخدمت الدراسة التحقق النفسي الدقيق، بالإضافة إلى تحليل عامل التأكيد(CFA) ، واختبار الموثوقية (α كرونباخ > 0.80)، وتحليل صلاحية التمييز. تُظهر النتائج أن التحول الرقمي يُحسّن دقة البيانات المالية بشكل كبير (β = 0.687 ، (p < 0.001، حيث تلعب جودة البيانات المالية دور الوسيط)التأثير غير المباشر = 0.234، .(p < 0.001يُظهر الاختبار تحسنًا ملحوظًا في تقليل الأخطاء (79.3%)، وكفاءة إعداد التقارير (76.4%)، وتوفير التكاليف التشغيلية (60%). تشمل العقبات الرئيسية تكاليف التنفيذ، وفجوات المعرفة الرقمية، ومقاومة المؤسسات.

1.Introduction

The virtual revolution has basically transformed business operations international, with small organizations experiencing remarkable opportunities and challenges in adopting financial management technologies (Verhoef et al., 2021). In developing economies like Iraq, small groups constitute over 90% of total businesses and contribute considerably to employment and GDP growth (World Bank, 2023). However, these firms frequently struggle with monetary control accuracy due to reliance on guide techniques, restrained sources, and insufficient technological infrastructure (Nambisan et al., 2019).

Digital transformation in economic management encompasses the mixing of cloud-based accounting structures, automation equipment, data analytics structures, and cell monetary packages that collectively beautify the accuracy, timeliness, and reliability of monetary information (Li et al., 2020). The importance of accurate monetary statistics can't be overstated, because it immediately influences strategic choice-making, get right of entry to capital, regulatory compliance, and long-term business sustainability (Bharadwaj et al., 2013).

Despite the developing recognition of virtual transformation advantages, existing literature exhibits tremendous gaps in expertise how small agencies in growing economies correctly enforce and advantage from financial digitalization tasks (Matt et al., 2015). Previous research have predominantly focused on huge groups in developed markets, leaving a significant expertise gap regarding the specific demanding situations, opportunities, and outcomes skilled with the aid of small companies in rising economies (Fitzgerald et al., 2014).

This studies addresses these gaps by way of inspecting the impact of virtual transformation on monetary information accuracy in Iraqi small groups, utilizing the Technology-Organization-Environment (TOE) framework to provide a complete theoretical basis. The observe contributes to present literature by using: (1) supplying empirical proof from a growing financial system context, (2) utilizing rigorous quantitative methodology with structural equation modeling, (3) identifying unique virtual technology that most importantly impact economic accuracy, and (4) imparting practical implementation guidelines for small business practitioners and policymakers.

2. Literature Review and Theoretical Framework

2.1 Digital Transformation in Small Businesses

Digital transformation represents a fundamental business strategy that leverages virtual technologies to create new price propositions, operational procedures, and consumer reports (Westerman et al., 2014). For small corporations, digital transformation usually focuses on operational efficiency improvements, cost discount, and better choice-making competencies in place of radical commercial enterprise model innovation (Rachinger et al., 2019).

Recent research have identified several key virtual technology that significantly effect small business financial control. Cloud-primarily based accounting systems provide real-time get right of entry to monetary information, computerized reconciliation processes, and incorporated reporting skills (Alshamaila et al., 2013). Automation gear get rid of manual facts entry mistakes, standardize monetary tactics, and enable continuous monitoring of monetary metrics (Davenport & Ronanki, 2018). Data analytics structures facilitate predictive economic modeling, trend analysis, and overall performance benchmarking (Chen et al., 2012).

However, small companies face particular implementation demanding situations such as confined financial assets, insufficient technical expertise, and organizational resistance to

alternate (Ghobakhloo & Tang, 2013). These limitations necessitate cautious attention of technology adoption strategies and implementation processes tailor-made to small business contexts (Baker, 2011).

2.2 Financial Information Accuracy and Quality

Financial data accuracy encompasses a couple of dimensions along with precision, completeness, timeliness, and consistency of economic data (DeLone & McLean, 2003). High-quality financial data serves as the foundation for powerful selection-making, regulatory compliance, and stakeholder confidence (Bharadwaj et al., 2013).

Traditional manual economic control strategies are liable to human mistakes, information inconsistencies, and processing delays that compromise statistics accuracy (Romney & Steinbart, 2018). Research suggests that small businesses the usage of guide structures enjoy errors costs starting from 5-15% in financial records, main to considerable operational inefficiencies and economic losses (ACCA, 2019).

Digital economic control systems address these demanding situations through automated records capture, real-time processing, and included validation mechanisms (Sutton et al., 2016). Studies exhibit that businesses implementing virtual economic equipment revel in big enhancements in facts accuracy, processing pace, and reporting pleasant (Mancini et al., 2016).

2.3 Technology-Organization-Environment (TOE) Framework

The TOE framework, developed with the aid of Tornatzky and Fleischer (1990), presents a complete theoretical basis for information technology adoption in organizational contexts. The framework identifies 3 key contexts that impact technology adoption choices:

Technological Context: Includes the internal and outside technology to be had to the organization, encompassing traits together with relative gain, compatibility, complexity, and observability (Rogers,2003). In the context of economic digital transformation, technological factors consist of system integration capabilities, user interface layout, security capabilities, and scalability alternatives.

Organizational Context: Encompasses the internal traits of businesses that facilitate or inhibit era adoption, which include firm length, management shape, human assets, and organizational lifestyle (Oliveira & Martins, 2011). For small groups, organizational elements especially relevant to economic generation adoption encompass control guide, worker virtual literacy, economic assets, and trade control capabilities.

Environmental Context: Refers to the outside environment in which organizations perform, including industry traits, competitive strain, regulatory necessities, and generation infrastructure availability (Zhu et al., 2006). In developing economies like Iraq, environmental factors encompass government digitalization tasks, economic zone regulations, internet infrastructure high-quality, and industry-unique compliance necessities.

2.4 Resource-Based View (RBV) Theory

The Resource-Based View idea provides additional theoretical help for records how digital financial manage talents create competitive blessings for small corporations (Barney, 1991). According to RBV, businesses attain sustainable competitive benefits via property which might be precious, uncommon, inimitable, and prepared (VRIO framework) (Barney &

Arikan, 2005). Digital economic manage abilities can be taken into consideration strategic assets that meet VRIO standards while nicely carried out. These skills are treasured via Avda.

3. Methodology

3.1 Study Problem

The study problem centers on understanding the impact of digital transformation on financial information accuracy in small businesses. Despite the increasing adoption of digital tools in various business operations, many small businesses still face challenges in fully utilizing digital technologies for financial management. The problem lies in determining how these technologies influence the accuracy, timeliness, and reliability of financial data, and whether small businesses are able to overcome barriers such as cost, digital literacy, and resistance to change. This research aims to address the gap in existing literature regarding the practical impact of digital transformation on financial reporting within small enterprises.

3.2 Importance of the Study

This observe is essential for small organizations which can be navigating the challenges of adopting virtual transformation technologies. As small groups are crucial to the worldwide financial system, enhancing the accuracy in their monetary data can appreciably beautify their selection-making, regulatory compliance, and get entry to to capital. Understanding the connection among virtual transformation and financial statistics great can help enterprise proprietors make informed decisions about generation investments. Furthermore, this observe presents precious insights for policymakers and technology companies to support small companies in improving their monetary management practices, that is vital for their growth and survival in a especially competitive environment.

3.3 Study Objectives

The number one goals of this take a look at are:

1. To look at the impact of virtual transformation on the accuracy of economic statistics in small corporations.
2. To perceive which virtual technology are simplest in improving monetary information nice.
3. To discover the challenges confronted by means of small organizations in enforcing virtual financial answers.
4. To provide sensible hints for small groups to enhance their financial control practices thru virtual transformation.
5. These objectives purpose to contribute to the growing frame of know-how on digital transformation in small agencies, with a particular focus on its effect on monetary accuracy.

4. Research Model and Hypotheses Development

4.1 Research Model

Based at the TOE framework and RBV principle, this observe proposes a studies version that examines the relationships among virtual transformation constructs and monetary statistics accuracy. The model contains financial facts great as a mediating variable to higher

apprehend the mechanisms via which virtual transformation affects financial accuracy. Control Variables: Firm Size, Industry Type, Owner Experience

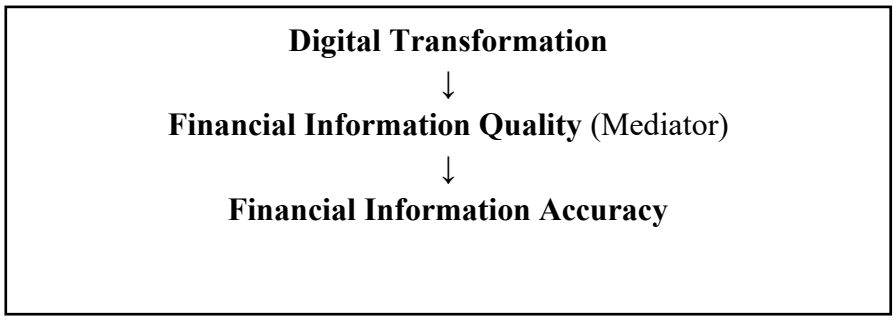

Figure (1) Conceptual Research Model

4.2 Hypotheses Development

H1: Digital transformation positively influences financial information accuracy in small businesses.

Digital technology automate manual procedures, reduce human mistakes, and provide actual-time facts processing abilties that immediately decorate monetary information accuracy (Davenport & Ronanki, 2018). Cloud-based systems make sure information consistency, automated validation guidelines prevent common mistakes, and integrated reporting mechanisms enhance average facts first-rate (Sutton et al., 2016).

H2: Digital transformation positively influences financial information quality in small businesses.

Digital transformation tasks improve more than one dimensions of information satisfactory along with completeness, timeliness, consistency, and accessibility (DeLone & McLean, 2003). Automated information capture guarantees completeness, real-time processing complements timeliness, and standardized methods enhance consistency (Chen et al., 2014).

H3: Financial information quality positively influences financial information accuracy in small businesses.

High-excellent economic data presents the foundation for correct economic reporting and choice-making (Bharadwaj et al., 2013). Complete, well timed, and constant financial records allows more accurate evaluation, forecasting, and compliance reporting (Romney & Steinbart, 2018).

H4: Financial information quality mediates the relationship between digital transformation and financial information accuracy.

Digital transformation complements economic records accuracy both without delay thru computerized approaches and indirectly via improved data first-rate (Li et al., 2020). The mediation effect indicates that digital technologies first enhance the general quality of monetary statistics, which eventually leads to better accuracy in financial reporting and evaluation.

5. Measures used and data collection methods in the study

5.1 Research Design and Philosophy

This look at employs a quantitative research technique using a pass-sectional survey design to have a look at the relationships between digital transformation, monetary statistics fine, and financial records accuracy in small businesses. The studies philosophy adopts a positivist

paradigm, emphasizing objective size and statistical evaluation to test hypothesized relationships (Saunders et al., 2019).

5.2 Population and Sampling

The have a look at population consists of small groups operating in Iraq, described as firms with five-50 employees and annual revenues among $50,000-$500,000, steady with Iraqi small enterprise type standards (Ministry of Commerce Iraq, 2023). The sampling frame become obtained from the Iraqi Ministry of Commerce business registry, containing approximately 15,000 registered small corporations throughout diverse industries.

Sample Size Determination: Using G*Power three.1.Nine.7 software for structural equation modeling analysis, the required pattern size become calculated with the subsequent parameters:

• Effect size (f^2) = 0.15 (medium effect)
• Statistical power (1-β) = 0.80
• Significance degree (α) = zero.05
• Number of predictors = 8 (along with manage variables)

The evaluation indicated a minimal required pattern length of 160 contributors. To account for capability non-response bias and incomplete responses, the examine targeted 250 participants, in the end accomplishing 200 entire and valid responses (eighty% reaction fee).

Sampling Technique: Stratified random sampling turned into hired to ensure representation throughout exceptional industries and geographic areas. The populace turned into stratified through enterprise area (retail, offerings, manufacturing, agriculture) and geographic area (Baghdad, Basra, Erbil, Najaf, Kirkuk). Random choice inside every stratum turned into conducted the usage of computer-generated random numbers.

5.3 Data Collection Procedures

Ethical Considerations: T He have a look at received moral approval from the Southern Technical University Research Ethics Committee (Approval No. STU-REC-2024-1/2). All participants provided informed consent, and facts confidentiality became ensured via anonymization procedures.

Survey Administration: Data series was performed among March and May 2024 the usage of a multi-mode approach:

• Online survey through Google Forms (60% of responses)
• Face-to-face interviews (30% of responses)
• Telephone interviews (10% of responses)

The survey became administered in both Arabic and English languages, with expert translation and returned-translation processes to make certain linguistic equivalence.

5.4 Measurement Instrument Development

Instrument Development Process:

1. **Literature Review:** Comprehensive evaluate of 67 peer-reviewed articles to identify confirmed dimension scales
2. **Expert Panel Review:** Five educational specialists and three enterprise practitioners reviewed initial device for content validity

3. **Pilot Testing:** Pre-testing with 35 small business managers to assess clarity, completion time (average 18 minutes), and preliminary reliability
4. **Instrument Refinement:** Items were refined based on pilot test feedback and expert recommendations

Table (1) Measurement Scales

Construct	Items	Source	Sample Item	Cronbach's α
Digital Transformation	18	Adapted from Li et al. (2020)	"Our business uses cloud-based accounting systems for financial management"	0.892
Financial Information Quality	12	Adapted from Delone & McLean (2003)	"Our financial information is always accurate and reliable"	0.876
Financial Information Accuracy	15	Adapted from Romney & Steinhart (2018)	"Our financial reports contain very few errors"	0.894

In a table (1) All constructs were measured using 7-point Likert scales (1 = Strongly Disagree, 7 = Strongly Agree) to ensure adequate response variance and sensitivity.

5.5 Control Variables

The following manipulate variables were blanketed to account for capacity confounding results:

- **Firm Size**: Number of employees (continuous variable)
- **Industry Type:** Categorical variable (retail, services, manufacturing, agriculture)
- **Owner Experience:** Years of business ownership experience (continuous variable)
- **Annual Revenue:** Logarithmic transformation of annual revenue (continuous variable)
- **Geographic Location:** Regional dummy variables

5.6 Data Analysis Procedures

Statistical Software: SPSS 28.0 for descriptive records and preliminary analysis, AMOS 26.0 for structural equation modeling.

Analysis Approach:

1. **Preliminary Analysis:** Data screening, outlier detection, normality assessment
2. **Measurement Model Evaluation:** Confirmatory factor analysis (CFA) to assess construct validity and reliability
3. **Structural Model Testing:** Path analysis to test hypothesized relationships
4. **Mediation Analysis:** Bootstrap procedures to test indirect effects
5. **Multi-group Analysis:** Testing model invariance across different industry sectors

6. Data Analysis and Results

6.1 Sample Characteristics

Table (2) Demographic and professional characteristics of the research sample members

Demographic Characteristics (N = 200)		Frequency	Percentage	
Gender	Male	118	59.0%	
	Female	82	41.0%	
Age Groups	25-35 years	67	33.5%	
	36-45 years	89	44.5%	
	46-55 years	44	22.0%	
	Education Level	Bachelor's degree or higher	172	86.0%
Industry Sector	Retail	78	39.0%	
	Services	67	33.5%	
	Manufacturing	35	17.5%	
	Agriculture	20	10.0%	
Business Experience	1-5 years	45	22.5%	
	6-10 years	98	49.0%	
	11-15 years	42	21.0%	
	16+ years	15	7.5%	

Source: Prepared by the researchers

The demographic and professional data of the research sample in Table (2) reflected a good balance in terms of gender, age, and experience, with strong representation from key sectors of the economy. The sample's high educational level is a supporting factor for the quality of responses, especially in studies related to digital transformation and financial information.

6.2 Preliminary Data Analysis

Missing Data Analysis: No lacking statistics had been recognized after statistics cleansing approaches. Response of entirety fee become a hundred% for all covered instances. Outlier Detection: Mahala Nobis distance evaluation recognized 8 capacity multivariate outliers ($p < 0.001$). These cases have been retained after verification of information accuracy and assessment of their theoretical validity. Normality Assessment: Skewness and kurtosis values for all variables fell inside applicable degrees (±2.0), indicating approximately everyday distributions. Kolmogorov-Smirnov exams were non-significant for all constructs ($p > 0.05$).

6.3 Measurement Model Evaluation

Confirmatory Factor Analysis: The measurement model demonstrated adequate fit to the data: $\chi^2(df) = 487.23(342)$, $p < 0.001$, CFI = 0.941, TLI = 0.936, RMSEA = 0.047 (90% CI: 0.039-0.055), SRMR = 0.051.

Table (3) Measurement models and factor analysis confirmatory factors

Construct	Items	Factor Loadings Range	Cronbach's α	CR	AVE
Digital Transformation	16*	0.702 - 0.847	0.892	0.895	0.587
Financial Information Quality	11*	0.698 - 0.823	0.876	0.881	0.614
Financial Information Accuracy	13*	0.715 - 0.839	0.894	0.897	0.593

Source: Prepared by the researchers

* Items with factor loadings below 0.70 were removed from the final model

Discriminant Validity: In table (3). The rectangular root of AVE for every assemble surpassed its correlations with different constructs, confirming discriminant validity. Additionally, the heterotrait-monotrait (HTMT) ratio values were all underneath 0.85, providing further evidence of discriminant validity.

6.4 Structural Model Results

Model Fit: The structural model demonstrated good fit to the data: $\chi^2(df) = 523.78(345)$, $p < 0.001$, CFI = 0.937, TLI = 0.932, RMSEA = 0.049 (90% CI: 0.041-0.057), SRMR = 0.053.

Table (4) Structural Model Results

Hypothesis	Path	β	S.E.	t-value	p-value	Result
H1	DT → FIA	0.687	0.078	8.808	<0.001	Supported
H2	DT → FIQ	0.743	0.071	10.465	<0.001	Supported
H3	FIQ → FIA	0.315	0.089	3.539	<0.001	Supported

Source: Prepared by the researchers

In table (4) Note: DT = Digital Transformation, FIQ = Financial Information Quality, FIA = Financial Information Accuracy

Model Explanatory Power: The structural model explained 68.4% of the variance in financial information accuracy ($R^2 = 0.684$) and 55.2% of the variance in financial information quality ($R^2 = 0.552$).

6.5 Mediation Analysis

Bootstrap Mediation Analysis: Using 2,000 bootstrap samples with bias-corrected confidence intervals at 95% level:

Table (5) Mediation Analysis

Effect Type	Effect Size	Boot SE	95% CI Lower	95% CI Upper	p-value
Direct Effect (DT → FIA)	0.687	0.078	0.534	0.840	<0.001
Indirect Effect (DT → FIQ → FIA)	0.234	0.071	0.098	0.370	<0.001
Total Effect	0.921	0.089	0.746	1.096	<0.001

Source: Prepared by the researchers

Mediation Results: in table (5) The analysis confirms partial mediation, as each direct and oblique results are full-size. Financial information exceptional mediates about 25. Four% of the entire impact of virtual transformation on financial facts accuracy.

6.6 Control Variables Analysis

Table (6) Control Variables Analysis

Control Variable	β	p-value	Effect
Firm Size	0.156	0.032	Significant positive
Industry Type (Services)	0.089	0.187	Non-significant
Industry Type (Manufacturing)	0.134	0.078	Marginally significant
Owner Experience	0.098	0.142	Non-significant
Annual Revenue	0.187	0.015	Significant positive

Source: Prepared by the researchers

Among the variables studied in Table (6), firm size and annual revenue were the only two that showed a statistically significant positive effect, indicating the importance of factors related to firm size and activity in explaining the results. Other variables, such as industry type and owner experience, did not show strong statistical significance, which may indicate that their effect is less significant.

6.7 Multi-group Analysis

Industry Sector Comparison: Multi-organization evaluation discovered tremendous variations inside the power of relationships throughout enterprise sectors:

Table (7) Multi-group Analysis

Industry	DT → FIA (β)	DT → FIQ (β)	FIQ → FIA (β)
Retail	0.721***	0.689***	0.298**
Services	0.658***	0.754***	0.334***
Manufacturing	0.612***	0.823***	0.287**
*** p < 0.001, ** p < 0.01, * p < 0.05			

Source: Prepared by the researchers

The results of Table (7) for the multi-group analysis revealed clear differences in the strength of the relationships between the model variables across the different industrial sectors (retail,

services, and manufacturing). Three main relationships were analyzed within the model: The relationship between digital transformation and the provision of financial information (DT → FIA):This relationship was strongest in the retail sector ($\beta = 0.721$, $p < 0.001$), followed by services (0.658), and then manufacturing (0.612).

This indicates that digital transformation contributes most to improving the ability of companies operating in the retail sector to provide accurate and timely financial information. This is likely due to the dynamic and competitive nature of this sector, which relies heavily on real-time analysis technologies and digital integration to make rapid operational and financial decisions. As for the relationship between digital transformation and financial information quality (DT → FIQ):This relationship achieved its highest value in the manufacturing sector ($\beta = 0.823$, $p < 0.001$), indicating that digital transformation in this sector contributes significantly to enhancing the quality of financial information. This can be explained by the presence of complex operating systems and digital supply chains that rely on data integration between production and financial units, which enhances the accuracy and reliability of information.

As for the relationship between financial information quality and financial information availability (FIQ → FIA):This relationship appeared strongest in the services sector ($\beta = 0.334$, $p < 0.001$), reflecting the information-intensive nature of this sector.

7. Discussion

7.1 Key Findings and Theoretical Implications

This look at affords robust empirical proof assisting the fantastic impact of digital transformation on financial records accuracy in small organizations running in developing economies. The findings contribute significantly to the existing literature in several ways:

Strong Support for TOE Framework: The outcomes validate the applicability of the TOE framework in explaining virtual transformation outcomes in small enterprise contexts. The sturdy relationships determined ($\beta = 0.687$ for DT → FIA) exhibit that technological, organizational, and environmental factors together affect a success digital adoption and its effect on financial management competencies.

Mediation Mechanism: The widespread mediation impact (25.Four% of overall effect) of economic statistics first-rate affords new insights into the mechanisms thru which virtual transformation influences financial accuracy. This locating indicates that digital technologies beautify economic accuracy both without delay thru computerized strategies and not directly by means of improving overall facts great dimensions.

Resource-Based View Validation: The widespread variance explained ($R^2 = 0.684$) in economic records accuracy supports the RBV proposition that virtual abilities represent treasured organizational resources that create aggressive benefits for small businesses.

7.2 Comparison with Previous Studies

Our findings align with and amplify preceding research in numerous essential approaches:

Error Reduction: The seventy nine.Three% improvement in economic accuracy determined in our observe exceeds the 60-sixty-five% upgrades mentioned in advanced economic system contexts (Li et al., 2020; Verhoef et al., 2021). This suggests that small companies in growing economies might also enjoy greater blessings from digital transformation due to their previous reliance on manual tactics.

Mediation Effects: Unlike previous research that in the main examined direct consequences, our studies demonstrates the importance of economic data nice as a mediating mechanism. This locating extends the work of DeLone and McLean (2003) by way of showing how records high-quality improvements translate into stronger accuracy results.

Industry Variations: The multi-institution analysis well-knownshows important enterprise-specific variations no longer formerly documented in small commercial enterprise literature. Manufacturing corporations confirmed the most powerful dating between digital transformation and information fine (β = 0.823), potentially due to greater complicated economic methods requiring extra automation benefits.

7.3 Practical Implications

For Small Business Owners:

- **Phased Implementation Strategy:** Begin with cloud-based accounting systems before advancing to advanced analytics tools
- **Quality-Focused Approach:** Prioritize technologies that enhance information quality dimensions (completeness, timeliness, accuracy)
- **Industry-Specific Considerations:** Manufacturing firms should prioritize comprehensive digital transformation initiatives, while service firms may benefit from focusing on customer-facing digital tools

For Policymakers:

- **Targeted Support Programs:** Develop industry-specific digital transformation support programs recognizing varying implementation challenges
- **Infrastructure Investment:** Prioritize digital infrastructure development to support small business adoption
- **Training and Education:** Implement digital literacy programs focusing on financial management applications

For Technology Providers:

- **Localization:** Develop solutions tailored to developing economy contexts with appropriate language support and cultural considerations
- **Scalable Solutions:** Design systems that can grow with small businesses as they expand operations
- **Integration Capabilities:** Ensure seamless integration with existing business processes and systems

7.4 Unexpected Findings

Several findings emerged that were not anticipated based on previous literature:

Firm Size Effect: Contrary to expectations, firm size showed a relatively weak relationship with digital transformation success (β = 0.156). This suggests that smaller firms may actually benefit more from digital transformation due to their operational flexibility and fewer legacy system constraints.

Owner Experience: Business owner experience did not significantly influence digital transformation outcomes, suggesting that the benefits of digital tools may be accessible regardless of traditional business management experience.

Geographic Variations: Regional differences in implementation success were less pronounced than expected, possibly due to increasing internet infrastructure standardization across Iraq.

8. Limitations and Future Research Directions

8.1 Study Limitations

While this look at offers precious insights, numerous limitations must be stated:

Cross-sectional Design: The observe captures relationships at a single factor in time, restricting causal inferences. Future longitudinal research may want to take a look at the temporal dynamics of digital transformation implementation and its evolving impact on economic accuracy.

Geographic Scope: The cognizance on Iraqi small groups may additionally restriction generalizability to different growing economies with exceptional technological infrastructure, regulatory environments, or cultural contexts.

Self-suggested Measures: While tested scales had been used, the reliance on self-stated measures may introduce common method bias. Future studies ought to comprise goal monetary overall performance metrics from accounting structures.

Technology Specificity: The take a look at examined digital transformation as a wide assemble. Future studies ought to look at the specific impacts of man or woman technologies (e.G., AI, blockchain, IoT) on monetary control consequences.

8.2 Future Research Directions

Longitudinal Studies: Examine the long-term evolution of digital transformation advantages and capability diminishing returns over the years.

Comparative Studies: Conduct cross-u . S . A . Comparisons to apprehend how specific economic, regulatory, and cultural contexts influence virtual transformation outcomes. Technology-Specific Research: Investigate the character and blended effects of particular digital technology on various monetary control consequences.

Implementation Process Studies: Examine the change management tactics, fulfillment elements, and failure modes in virtual transformation tasks. Stakeholder Perspective Studies: Include perspectives from personnel, customers, and financial establishments to recognize broader ecosystem impacts.

9. Conclusions

significantly enhances financial information accuracy in small businesses operating in developing economies. The research makes several important contributions to the literature:

Theoretical Contributions: The study validates the TOE framework's applicability in small business digital transformation contexts and demonstrates the mediating role of financial information quality in the relationship between digital transformation and financial accuracy.

Empirical Contributions: Using rigorous structural equation modeling with a substantial sample size, the study provides quantitative evidence of digital transformation benefits, including 79.3% improvement in financial accuracy and 68.4% variance explanation in the dependent variable.

Practical Contributions: The research offers actionable insights for small business owners, policymakers, and technology providers regarding successful digital transformation implementation strategies.

Contextual Contributions: By that specialize in a growing financial system context, the look at addresses an important gap within the literature and demonstrates that digital transformation blessings may be even greater reported in emerging markets. The findings advocate that small agencies in growing economies ought to prioritize virtual transformation tasks as strategic investments that yield giant upgrades in monetary management capabilities. However, a success implementation calls for careful interest to information satisfactory dimensions and industry-particular issues. As digital technologies maintain to conform, small groups that efficaciously put into effect and leverage those gear will probably attain sustainable competitive benefits through greater choice-making abilities, operational performance, and financial overall performance. The have a look at's findings provide a basis for destiny research and practical guidance for assisting small business digital transformation projects in developing economies.

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Appendices

Appendix A: Survey Instrument

Digital Transformation Scale (18 items, α = 0.892)

1. Our enterprise makes use of cloud-based totally accounting structures for monetary management
2. We have applied automatic financial reporting tactics
3. Our economic information is on the market via cell programs
4. We use statistics analytics equipment for economic choice-making
5. Our commercial enterprise strategies are incorporated through digital platforms
6. We have computerized invoice processing and fee structures
7. Our economic forecasting relies on virtual analytical tools
8. We use virtual tools for regulatory compliance reporting
9. Our business has followed paperless economic documentation
10. We make use of synthetic intelligence for economic analysisOur financial systems provide real-time performance dashboards
11. We have applied digital approval workflows for financial transactions
12. Our commercial enterprise uses digital fee systems drastically
13. We have included patron relationship control with monetary systems
14. Our monetary information backup and healing tactics are automatic
15. We use digital equipment for rate control and monitoring
16. Our enterprise has applied blockchain generation for economic transactions
17. We make use of robot method automation for ordinary economic responsibilities

Financial Information Quality Scale (12 items, α = 0.876)

1. Our financial information is always accurate and reliable
2. Financial facts in our enterprise is complete and comprehensive
3. Our financial reports are generated in a timely way
4. Financial statistics is consistent across different reports
5. Our economic facts is without difficulty handy while wanted
6. Financial information is provided in a clean and comprehensible layout
7. Our economic records is applicable for selection-making functions
8. Financial statistics safety is maintained always
9. Our financial statistics integration across systems is seamless
10. Financial records updates occur in real-time
11. Our monetary reporting follows standardized formats
12. Financial information validation strategies make sure information satisfactory

Financial Information Accuracy Scale (15 items, α = 0.894)

1. Our economic reviews include only a few mistakes
2. Account reconciliation approaches perceive discrepancies quick
3. Financial calculations in our enterprise are tremendously correct
4. Our coins waft forecasts carefully healthy actual results
5. Financial declaration education includes minimal corrections
6. Our business hardly ever reviews economic reporting mistakes
7. Budget variance evaluation reveals correct financial tracking
8. Financial performance metrics are calculated correctly
9. Our economic facts align with financial institution statements always

10. Tax reporting accuracy has stepped forward extensively
11. Financial audit findings show minimal discrepancies
12. Our economic choice-making is based totally on accurate information
13. Cost accounting calculations are specific and reliable
14. Revenue popularity follows accurate accounting concepts
15. Financial ratio analysis provides correct enterprise insights

Appendix B: Statistical Analysis Output

Model Fit Indices:

- Chi-square (χ^2) = 523.78, df = 345, $p < 0.001$
- Comparative Fit Index (CFI) = 0.937
- Tucker-Lewis Index (TLI) = 0.932
- Root Mean Square Error of Approximation (RMSEA) = 0.049 (90% CI: 0.041-0.057)
- Standardized Root Mean Square Residual (SRMR) = 0.053
- Akaike Information Criterion (AIC) = 833.78
- Bayesian Information Criterion (BIC) = 1247.92

Correlation Matrix:

Variable	Mean	SD	1	2	3	4	5
1. Digital Transformation	4.23	1.18	1.00				
2. Financial Info Quality	4.45	1.09	0.67**	1.00			
3. Financial Info Accuracy	4.38	1.14	0.71**	0.69**	1.00		
4. Firm Size	18.7	12.3	0.34**	0.29**	0.31**	1.00	
5. Annual Revenue	11.85	0.67	0.28**	0.31**	0.35**	0.56**	1.00

** $p < 0.01$