



Assessing the Perceived Impact of Digital Transformation on the Efficiency of Sales Growth in Nepal

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Abstract

Digital transformation (DT) involves a broad range of advancements in information and communication technology aimed at optimizing limited resources and driving competitive advantage in the business world. The aim of the paper is to assess the perceived impact of DT on the efficiency of sales growth among small and medium scale enterprises (SMEs) in Nepal. Technology–Organization–Environment (TOE) framework was adopted to fulfil the aim of the research ensuring theoretical relevance and justification. This study is based on the primary data collected from study site during January to April 2025 using purposive sampling within selected strata to fulfil research objective. The analysis involved cross-sectional survey data from 384 SMEs of Kailali and Kanchanpur District of Nepal, and a regression model was estimated to calibrate efficiency in sales growth as the dependent variable. The estimated regression results show that the level of digitization, firm size, adoption of digital payments, age of firm, and cost efficiency all have positive and statistically significant impacts on sales growth efficiency. Moreover, cost efficiency exhibited the largest effect (0.412, $p < 0.01$),



highlighting the importance of cost management in driving revenue growth. Similarly, adoption of digital payments (0.160, $p < 0.05$) and level of digitization (0.235, $p < 0.01$) demonstrated significant contributions, reflecting how technology adoption enhances customer experience and operational capabilities. However, SMEs face notable barriers to DT, including poor internet access and high cost, limited technical expertise, and high costs of digital tools. The findings suggest that DT enhances sales performance, its benefits depend on firm-specific resources, readiness, and infrastructure availability. The study provides empirical evidence that supports policy efforts aimed at improving digital infrastructure, lowering adoption costs, and enhancing digital skills and aligns with Sustainable Development Goal 9 (SDG9). Therefore, strengthening these areas could accelerate sales growth efficiency and competitiveness of Nepalese SMEs in an increasingly digital economy.

Keywords: Digital Transformation, sales growth efficiency, regression analysis, SMEs, Nepal

JEL Classification: O33, M15, L25

Introduction

The concept of digital transformation (DT) encompasses a wide range of technological advancements, including social media engagement, e-commerce platforms, cloud computing, data analytics, and mobile applications meant for resource optimization. This paper examines how DT, characterized by the integration of digital technologies into business performance in terms of sales growth of small and medium scale enterprise (SMEs) in Nepal. In other words, this is a research output based on the cross-sectional analysis meant for assessing the impact of DT on sales revenue growth in the study area. Intuitively, DT significantly is expected to raise sales volume for SMEs when adoption aligns with the strategy, capability, and market access. In this regard, evidence from regional and global studies shows digital tools increase market reach, lower transaction costs, and improve customer engagement leading to measurable sales revenue gains for SMEs (Adhikari & Molla, 2024). Recent literature links firm-level digitalization to sales growth through three mechanisms: expanded market access via e-commerce and social platforms; improved demand capture through digital marketing and analytics; and efficiency gains that free resources for sales activities (Wei & Shen, 2025). Moreover, studies across developing and developed countries contexts report positive associations between digital adoption and revenue or profitability, conditional on firm capabilities and external infrastructure (Wang & Xia, 2024).

The DT of SMEs is a topic of increasing importance in today's global economy. In the last two and half decades or so, DT has transformed all sectors of economy due to the penetration of information and communications technology (ICT) notably via the internet (Affandi et al., 2024). As SMEs intensify the DT, understanding the impact of digital transformation on SMEs becomes crucial for policymakers, business owners, and researchers alike (Mishrif & Khan, 2023). Therefore, DT has emerged as a critical factor shaping the contemporary business landscape worldwide. Essentially, SMEs are regarded as the backbone of local economies, are increasingly embracing digital technologies to enhance their



competitiveness, efficiency, and sustainability. In Nepal digital uptake accelerated during COVID-19 as firms shifted sales online to survive throughout the lockdown period. Several systematic reviews report a curvilinear or contingent relationship: returns rise with digital intensity up to a point and depend on complementary assets such as skills, logistics, and managerial routines (Bhandari et al., 2023). Obviously, local studies find Nepalese SMEs benefit from digital tools for customer outreach and continuity, but face barriers: low digital skills, limited broadband in some districts, payment frictions, and financing constraints. These constraints moderate the revenue impact of digital investments in peripheral districts such as Kailali and Kanchanpur.

The main thrust of the study was to assess the perceived impact of DT on the efficiency of sales growth of SMEs and facilitating a comprehensive exploration of the phenomenon and its implications for organizational practice and strategy in the study area. Here, perceived impact refers to the impact as reported by the respondents based on their intuition and lived experience. This strategy of eliciting data was adopted by the researcher to overcome the issue relating to getting real and objective financial data from the respondent SME owners. It is to be noted that the researcher is not in the position to compel them to show real financial documents. These were the reasons why; researcher was to depend on this soft side of getting reliable data relating to variables of interest to fulfil the aim of this research. Therefore, the pertinent research questions of the study were to: What are the DT systems used by SMEs in the study area in terms of level of digitization? How is the impact of DT on sales revenue growth within SMEs operated in the study area? What challenges and barriers do SBFs encounter in the process of DT.

Review of Related Literature

Theoretical Review

The theoretical perspectives need to focus our explanation on how DT influences overall resources optimization in general and efficiency on sales growth in particular. In this regard, the Resource-Based View (RBV) postulates that firms achieve competitive advantage by deploying valuable, rare, inimitable, and non-substitutable resources (Barney, 1991). The Dynamic Capabilities Theory underscores that a firm's ability to sense, seize, and reconfigure resources to respond to market shifts (Teece, 2018). But the most pertinent theory that underpins this study is Technology–Organization–Environment (TOE) framework. As TOE framework highlights that DT adoption outcomes depend not only on technological readiness but also on organizational characteristics and environmental context (Tornatzky & Fleischer, 1990). To align with the TOE framework, the variables in this research are categorized to reflect their theoretical relevance and justification. In other words, the technological context includes the level of digitization and the use of digital payments, which capture the extent of digital adoption and integration within firms. Similarly, the organizational context comprises firm size, age of the firm, and efficiency in cost reduction, representing internal resources, operational efficiency, and experience, that shape the capacity of SMEs to leverage digital technologies. Likewise, the environmental context is represented by the challenges faced by



the SMEs. Finally, the efficiency in sales growth serves as the dependent variable. Essentially, it reflects the overall performance outcome of DT.

Therefore, the TOE framework is found to be a suitable approach to carry on the research. It is so because the focus of this study is on the *perceived* impact of DT on sales growth efficiency, which is not merely determined by technology alone but also by organizational readiness (e.g. skills, size, management support) and environmental context (e.g. infrastructure, regulation, customer digital literacy). Moreover, the TOE framework explicitly integrates the above mentioned three dimensions, making it more comprehensive than single-resource or innovation-focused theories. Similarly, in Nepal's case, external constraints like poor internet connectivity, weak digital payment systems, and regional disparities are critical factors that influence more importantly whether digital adoption translates into revenue growth for SMEs. Thus, the aforementioned theoretical lens on DT enables SMEs to develop such dynamic capabilities by facilitating agility, flexibility, and continuous learning in the face of DT. These theoretical lens provided better and precise understanding and guidelines for selecting overall design and analysis techniques for assessing the impact of DT for sales revenue growth of SMEs in Kailali and Kanchanpur district, Therefore, by adopting TOE, the analysis is expected to capture a holistic view of how firms *perceive* DT's effect on sales growth, aligning well with Nepal's heterogeneous SME landscape.

Empirical Review

DT has become a vital driver of competitiveness and sales growth of SMEs and integrates national, regional and global economy. Several empirical studies emphasize that adopting digital tools improves operational efficiency, innovation capacity, market reach, and customer engagement. Li and Liu (2014) examined SMEs in China and their study found that digital adoption significantly enhanced firm performance through improved supply chain integration and better customer relationship management. Moreover, empirical research has provided valuable insights into the drivers, challenges, and outcomes of DT initiatives within small business firms. For example, studies have identified leadership support, organizational culture, and employee skills as critical determinants of DT success (Avgerou et al., 2016).

DT has become a central theme of firm strategy for driving sales revenue growth. Empirical research shows a positive association between DT and firm performance but also shows that the effect on sales depends on which digital practices are adopted, firm capabilities, and local context (Verhoef et al., 2021; Kane et al., 2015). Studies that focus specifically on firm-level outcomes identify clear mechanisms through which digital tools create effect on sales revenue through expanded market access, reduced transaction costs, improved customer acquisition and retention, and enhanced sales processes (Duch-Brown et al., 2017; Teng et al., 2022). Moreover, cross-country enterprise surveys and microdata analyses repeatedly find that SMEs using digital technologies revealed higher net sales and output after controlling for size and sector (Seclen-Luna et al., 2022). Simple use of isolated digital tools produces weaker or inconsistent revenue effects. Remarkably, the critical differentiator is whether digital technologies and systems are embedded into business processes and supported by



complementary assets such as skilled human resources with analytical capabilities, and process redesign (Bharadwaj, 2000; Kraus et al., 2021). These results enhance digital investments in SMEs and develop rare, valuable, and inimitable IT capabilities that align them with business strategy (Bharadwaj, 2000).

Digital financial services and payment innovations are a prominent channel in developing economies of scale in overall SMEs performance. Empirical evaluations of mobile money rollouts and digital payment adoption find increases in firm turnover and local economic activity (Patnam & Yao, 2020; Shaikh et al., 2023).

Mishrif and Khan (2023) study examines the technological transformations and challenges faced by SMEs during the COVID 19 pandemic, focusing on the logistics and supply chain sector in Oman and the findings have practical implications for policy making and company executives, highlighting the importance of adopting innovation and technology increasing competitiveness for market expansion and sales growth. Essentially, these effects operate through faster transactions, reduced cash-handling costs, and easier access to credit and broader customer bases. Mobile payments and digital wallets are increasing in recent times in Nepal, and this literature suggests payment integration is likely to raise perceived sales growth for many SMEs, and conditional on customer acceptance. Some studies document net market expansion and higher revenue shares from online channels particularly for consumer-facing retail firms. Others find short-term substitution from offline channels that dampens aggregate sales growth or creates distributional shifts across channels (Duch-Brown et al., 2017; Lorça et al., 2019). Sectoral heterogeneity perspectives, retail and services firms often gain more from online sales and digital marketing than capital-intensive manufacturers. Likewise, meta-analyses and systematic reviews show consistent links between digital marketing practices and improved customer metrics that feed into revenue growth when measurement and follow-through occur (Verhoef et al., 2021; Tang et al., 2025). However, studies differ in outcome measures such as revenue, and online-sales share.

Several firm-level moderators recur across empirical work, where digital maturity and strategic alignment are primary moderators to determine whether DT investments translate to sales (Kane et al., 2015). In this regard, complementary human capital and analytics capability amplify benefits. Nevertheless, infrastructure and market conditions moderate country-level effects; outcomes are larger where internet penetration with logistics, and digital finance are robust (Kraus et al., 2021; Seclen-Luna et al., 2022).

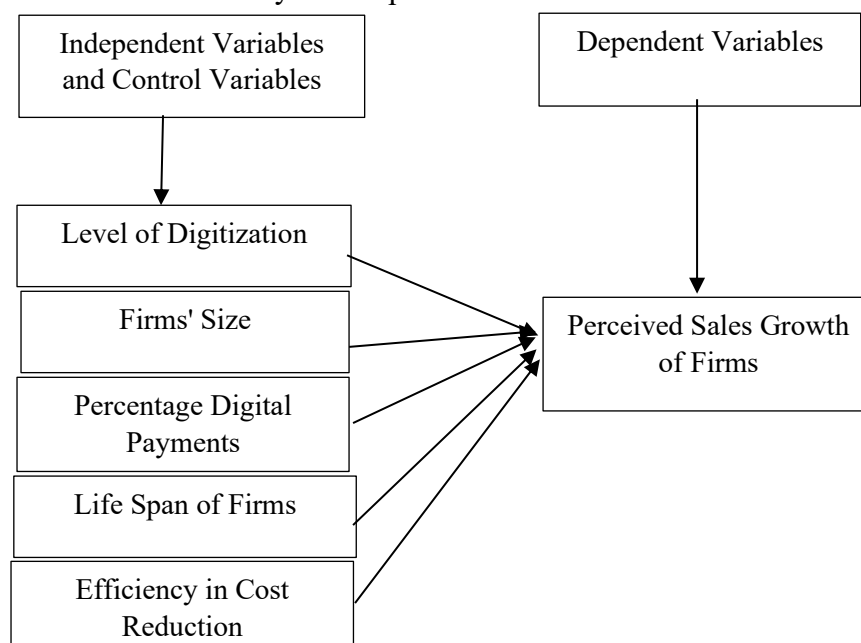
Methodological gaps and measurement issues remain relevant for the study like this in Nepal. Firstly, many studies rely on self-reported measures of digital adoption and perceived impact. In this regard, perceived impacts are valuable but can diverge from objective revenue measures. It is to be noted that the best practice is triangulation: combine survey-based perceived impact with objective indicators such as perceived changes in recorded sales, share of revenue from online channels and so on (Ferrantino & Koten, 2022). Secondly, heterogeneity across different sectors and firm size suggests interaction effects should be tested rather than estimating average treatment effects only. Thus, overall literature provides insights

that there would be a positive average association between DT and perceived sales growth but significant variation across firms driven by capabilities and context.

Despite the growing body of literature on DT and its contribution of overall SMEs performance, there remains a notable gap in our understanding of its specific implications for SMEs sales growth based on perceived change as reported by the respondents. In other words, the global and regional studies confirm the performance-enhancing effects of DT in SMEs, there is limited empirical evidence, particularly in under-researched districts such as Kailali and Kanchanpur. This literature is expected to fill an evidence gap by assessing the impact of DT with other selected control variables on sales outcomes in the study area. Likewise, findings are expected to guide targeted interventions that maximize sales volume per rupee invested in DT of SMEs. Moreover, it is important to address policy gaps related to digital skills development, affordable connectivity, and logistics partnerships in the market-place to ensure that digital adoption translates into sustainable sales growth.

Conceptual Framework

Based on the literature review, researcher have drawn insights to draw conceptual framework for the analysis that presented below:



Source: The Researcher has developed the conceptual framework based on the literature review.

The framework presented above clearly displays the various elements that contribute to DT within SMEs, highlighting how these factors interact to impact both operational and market performance in Nepalese context. Similarly, the conceptual framework also considers moderating variables that could influence the DT process.



Research Methodology

Research Design

The paper primarily adopts a quantitative research approach followed by the qualitative interpretation estimated result. Likewise, it follows cross-sectional research design based on the times of contact with the respondents of the study. A structured survey questionnaire for a representative sample of SMEs across various sectors in the Kailali and Kanchanpur district was selected for data collection. Moreover, it was focused on gathering quantitative data on factors such as the perceived contribution of DT for perceived sales growth efficiency and overall business performance. Likewise, data regarding level of digitization, firm size, efficiency in operational cost reduction and life span of selected firms.

Research Philosophy

The research adopts a pragmatic realist stance to examine the impact of DT on SMEs in the context of efficiency of sales growth. It recognizes both objective outcomes such as level of digitization, firm size, percentage of digital payments, age of firms and operational efficiency cost reduction, and sales growth and subjective dimensions, including challenges experienced during adoption. Hence, by integrating objectivism perspectives, the study employs a quantitative approach to generate reliable, valid, and actionable knowledge with practical relevance for business owners, policymakers, and stakeholders. Likewise, ontologically, it assumes that DT is a real phenomenon reflected in measurable changes while also shaped by individual perceptions. Moreover, epistemologically, the study combines positivism, which emphasizes quantifiable impacts, with interpretivism, which captures perceptions and contextual factors. In Axiological perspectives, it values ethical responsibility, ensuring accuracy, confidentiality, and respect for participants while producing socially relevant insights. Finally, methodologically, the research emphasizes quantitative analysis of data collected through surveys and structured questionnaires.

Population Sample Size and Sampling Strategy

The study focused on SMEs in Kailali and Kanchanpur districts of Far Western Province in Nepal, where DT is emerging but unevenly adopted. These districts represent a mix of growing urban centers and rural markets, providing a realistic setting to examine how digital tools influence sales growth efficiency. For sampling purpose, the study stratified SMEs in Kailali and Kanchanpur by the sectors they operate to capture variation in digital adoption and sales growth efficiency. The key strata include hotel and restaurant, retail grocery, garment clothing, hardware business, healthcare service, education sector, agro-processing, kitchen utensil and manufacturing related SMEs. Essentially, this stratification is expected to ensure representation across diverse operational contexts and allows comparison of how DT affects different business types. Within the strata, a purposive sampling strategy was adopted to target SMEs actively engaged in or exposed to digital practices, ensuring data relevance and depth. In this way, by combining purposive sampling with stratification, the study maintains both focus and diversity, enhancing the reliability and generalizability of findings on the perceived impact of DT on sales growth efficiency in the Far Western Province. Therefore, this approach

allows for meaningful insights into the perceived impact of DT in regions that are developing but not yet fully digitized. According to Carrier et al. (2004) formula for determining sample size(n) when population size (N) is large and the desired level of precision (margin of error, M is specified) is given by:

$$n = \frac{Z^2(p)(1-P)}{M^2} \quad \dots(1)$$

In the equation (1) above, 'n' denotes sample size and Z stands for Z-score corresponding to the desired level of confidence (usually based on the standard normal distribution, e.g., for a 95 % confidence level, $Z = 1.96$). Likewise, p stands for estimated proportion of the population with the characteristic of interest (if unknown, a common practice is to use 0.5, which maximizes the sample size for a given margin of error) and desired margin of error(M) is 0.05 (expressed as a proportion) respectively. This formula provides the minimum sample size required to estimate a population proportion with a specified level of confidence and precision. The calculation procedure of the formula of equation (1) is presented as:

$$n = \frac{(1.96)^2(0.5)(1-0.5)}{(0.05)^2} = 384.16$$

Where, the rounded figure 384.16 is considered as 384.

Methods of Data Collection

The structured questionnaire was administered to collect relevant data to fulfil the research objectives. The structured questionnaire was used to survey SME owners to understand their experiences, perceptions, and operational efficiency, cost reduction and sales growth of SMEs. The structured questionnaire was administered via Google form.

Methods and Tools of Data Analysis.

The data collected using Google form were recorded in excel for further analysis. The study has collected predominantly quantitative data using close ended questions followed by the open ended questions were also used to collect relevant data relating to open view of SBFs entrepreneur regarding digitization experience. Therefore, quantitative data are analyzed using quantitative tools followed by the qualitative discussion. The proposed regression models were estimated to draw inference from the data.

Variables and Their Measurement

The operational definitions of the variables and their measurements that are used in the analysis process are discussed here under.

Table 1

Operational Definition of the Variables Used in the Analysis

Code	Operational Definition	Nature of Variables	Measurement Scale
logESG	Efficiency in Sales Growth	Outcome Variable	Ratio
LD	Level of Digitization	Independent Variable	Categorical
logFS	Number of Employee	Independent Variable	Ratio

logDP	Overall percentage digital payments in the business	Independent Variable	Ratio
Log AF	Age of SMEs	Control Variable	Ratio
logECR	Efficiency in Cost Reduction	Control Variable	Ratio

Note. Table 1 provide detail description about variable code, operational definition, nature of variables and measurement of variables.

Specification of Regression Model

The basic linear regression model in matrix form to assess the contribution of DT on the operational cost reduction SBFs of Nepal could be specified as:

$$ESG_i = X_i\beta_i + Z_i\gamma_i + \mu_i \quad \dots(2)$$

In the equation (2) above ESG_i refers to the efficiency in sales growth of i th SMEs. Likewise, X_i and Z_i refers to the vector of independent variables and vectors of control variables relating to ' i ' th SMEs. Moreover, β_i , γ_i , and μ_i refers to estimated coefficients of the independent, control variables and error term respectively.

The regression equation specified in equation (2) can be presented in logarithmic form as follows:

$$\ln ESG = \beta_0 + \beta_1(LD) + \beta_2 \ln(FS) + \beta_3 \ln(DP) + \beta_4 \ln(AF) + \beta_5 \ln(ECR) + \varepsilon \quad \dots(3)$$

In equation (3) above, β_0 denotes intercept and $\beta_1, \beta_2, \dots \beta_5$ are the slope coefficients to be estimated. Likewise, stands for residual error term. The acronyms given in the model are defined in Table 1 above. All the ratio scale variables were transformed into log value other than categorical variable level of digitization for the meaningful interpretation of estimated coefficients.

Estimated Result and Discussions

The estimated result and discussions are presented with Table 2 to Table 6 subsequently.

Estimated Result of Empirical Model

Table 2 below summarizes an estimated regression model to investigate the determinants of Efficiency in Sales Growth (logESG) among SMEs of the study area. Likewise, it also presents various diagnostic results such as coefficient of variation, F-statistics reflecting the explanatory power of variables included in the model, Durbin-Watson statistical test results that indicate an acceptable range for autocorrelation issues.

Table 2

Estimated Result of Regression Equation

Dependent Variable: Efficiency in Sales Growth			
Variable	Coefficient	Std. Error	t-Statistic
LD	0.235***	0.069	3.405
logFS	0.155**	0.061	2.541
logDP	0.160**	0.063	2.525
logAF	0.175***	0.047	3.741
logECR	0.412***	0.049	8.448

Constant	0.169**	0.084	2.024
R-squared	0.429		
Adjusted R-squared	0.421		
F-statistic	56.557		
Prob(F-statistic)	0.000		
D-W Statistics	1.59		

Note. Table 2 above shows the estimated output of regression model 4.

Data Source: Field Survey, 2025. Significance Levels: *** $p < 0.01$; * $p < 0.05$; $p < 0.10$.

Evidently, the regression model explains approximately 42.9 percent of the variation in perceived efficiency sales growth of the business, as indicated by the R^2 value. Likewise, the adjusted R^2 42.1 confirms a moderate fit after accounting for degrees of freedom. The adjusted R^2 value 0.421 is moderate. In social science and firm-level studies, especially involving cross-sectional SME data, R^2 values between 0.3 and 0.5 are typical and acceptable and suggest a reasonably good fit without being too high which could be inferred as overfitting. Therefore, the adjusted R^2 value of 42.1 percent indicates a reasonably strong explanatory power for cross-sectional firm-level data, suggesting the model is statistically acceptable and robust if other diagnostic tests confirm no major violations of regression assumptions (Hair et al., 2019; Cohen, 2013). Moreover, the F-statistic of 56.557 with a $p < 0.01$ indicate that the model is statistically significant, reflecting that the explanatory variables jointly have a meaningful impact on operational efficiency of cost reduction of the SMEs in the study area. Finally, the Durbin-Watson statistic of 1.59 indicates that this is within an acceptable range and does not raise serious issues regarding the independence of errors in the model.

Table shows that the positive and statistically significant coefficient for level of digitization(LD) (0.235, $p < 0.01$) indicating a higher level of digitization is associated with increased efficiency in sales growth of small business growth in the study area. The coefficient for the variable firm size as measured by number of employees (logFS) is statistically significant (0.155, $p < 0.05$) suggests that an increase in the number of employees leads to efficiency in sales growth of the SMEs in the study area. The positive and significant coefficient for the percentage of digital payments of total transactions (logDP) is also statistically significant (0.160, $p < 0.05$). The coefficient (0.175, $p < 0.01$) for the age of the SMEs (logAF) shows that older firms tend to have better sales growth efficiency in the study area. The highest positive and highly significant coefficient (0.412, $p < 0.01$) for the variable log ECR suggests that firms that are more cost-efficient also achieve higher efficiency in sales growth in the study area.

Test for Multicollinearity

Table 3 correlation matrix value reveals a weak correlation amongst the explanatory variables included in the model implying that there is no issue of multicollinearity. In other words, result shows the estimated result the correlation matrix and reveals that none of the independent variables are highly correlated ($|r| < 0.8$) except principal diagonal, suggesting the absence of multicollinearity issues. Hence, this indicates that the estimated coefficients in the

logistic regression model provides stable and reliable coefficients, and the relationships among predictors do not distort the model's estimations.

Table 3

Correlation Matrix of the Explanatory Variables

Variables	LD	logFS	logDP	logAF	logECR
LD	1.000				
logFS	0.108	1.000			
logDP	0.384	0.330	1.000		
logAF	0.284	0.275	0.272	1.000	
logECR	0.409	-0.030	0.460	0.277	1.000

Note. Table 3 above shows the estimated result of correlation matrix as test for multicollinearity. of the explanatory variables included in the regression model 3. Data Source: Field Survey, 2025.

The Table 3 below shows variance Inflation Factor (VIF) values for the estimated model. The centered VIF values for all variables LD (1.309), log FS (1.257), log DP (1.561), log AF(1.220), log DP(1.561), and log ECR (1.499) and all are well below the critical threshold of 10, suggesting no serious multicollinearity issues. Therefore, the centered VIFs confirm that the estimated regression coefficients are stable, and the model does not suffer from any issue of multicollinearity that would distort the interpretation of the variables.

Table 4

Variance Inflation Factors

Variables	Coefficient Variance	Centered VIF
LD	0.005	1.309
logFS	0.004	1.257
logDP	0.004	1.561
logAF	0.002	1.220
logECR	0.002	1.499

Note. Table 4 above shows the estimated VIF for regression model 3.

Data Source: Field Survey, 2025.

Challenges Faced by Firms in Adopting Digital Technologies

Table 5 below gives scenarios about the challenges faced by the firms in adopting digital technology. Obviously, the sample size of the study was 384. In this regard, each respondent has a chance of expressing more than one challenge. Therefore, the frequency of Table for data shows more than sample size.

Table 5

Challenges Faced by SMEs in Digital Transformation

Challenges Identified	Frequency
Lack of reliable internet access	185
Lack of technical expertise	163

High costs of digital tools	148
Resistance to change within the organization	95
Others	34

Note. Table 5 shows a summary of challenges faced by the small business.

Data Source: Field Survey, 2025.

Table 5 above shows that SMEs are suffering from lack of reliable internet access (48.17%) is the most reported challenge, indicating infrastructural inadequacy is a widespread issue, followed by lack of technical expertise (42.44%) comes second, showing a strong need for digital skills training, high costs of digital tools (38.54%) remain a significant third financial barrier. Likewise, resistance to change (24.74%) is also a major organizational challenge, reflecting cultural and attitudinal obstacles. Moreover, other reasons (8.85%) such as lack of management support, lack of awareness about digital tools, cybersecurity concerns, uncertainty about return on investment, unreliable power supply as challenges to adopt digitization.

Level of Digitization Adopted by Respondent Firms

The Table 6 below presents the level of digitization categorized based on digitization tools used by the respondent SMEs in the study area. In other words, items are converted into categorical variables based on the digital tools adopted. To operationalize it, value 1 is allotted for the form using basic levels of tools such as calculators, mobile banking, and computers. Including this first level, if other tools such as social media marketing, digital wallets (e.g. IME pay, E-Sewa) is used, then it is categorized level 2. Moreover, including these two, additional digital systems such as business software, accounting software, website. Furthermore, this conventional ordinal categorization level of digitization is made based on the insight from previous work of Mick et al. (2024).

Table 6

Level of Digitization by the Respondent SMEs

Level	Label	Description	Frequency
1	Basic Digitization	Calculators, Mobile phone communication & banking and Excel for record-keeping.	224
2	Intermediate Digitization	Social media promotion (Facebook, Instagram), digital payments (eSewa, IME Pay, Khalti), with inclusion of above basic level	211
3	Advanced Digitization	E-commerce platforms, Accounting Soft-ware, customer relationship management (CRM) systems with inclusion of intermediate level.	65

Note. Table 6 shows frequency table for level of digitization of respondents firms.

Data Source: Field Survey, 2025.

Table 6 Amongst respondent small business firms, most businesses (224) are in the early stage of digitization, using only basic tools such as calculator, mobile phone communication, and excel for record-keeping. Likewise, a significant portion of businesses (211) are adopting additional tools and strategy such as social media marketing, digital wallets



(e.g. E-Sewa, IME pay) with inclusion of basic level. Finally, of 384 only 65 SMEs found to be adopting additional digital systems such as business software, accounting software, website, with inclusion of intermediate level.

Discussion

This research carried out assessment of efficiency in sales growth among SMEs in Nepal through an econometric model incorporating digitization level, size of SMEs, percentage digital payment adoption, age of SMEs, and cost-efficiency. In this context, this section discusses what these econometric analysis results imply, how they align or contrast with existing body of literature and evidence, and why they matter for policy and practice, particularly under Nepal's ongoing digital transformation in the digital economy Nepal. The estimated regression results show that all these factors have significant positive influence on sales growth efficiency, explaining about 42.1 percent of its variation as reflected by coefficient of variation.

The positive coefficient of Level of Digitization (LD) ($\beta = 0.235$, $p < 0.01$) demonstrates that digital adoption significantly enhances sales growth efficiency among SMEs. This is consistent with prior studies of Nambisan et al. (2019) showing that digital technologies improve information flow, marketing reach, and customer responsiveness, thereby fostering higher sales performance. Obviously, for SMEs, adopting mobile-based business applications, digital tools like social media marketing, and e-commerce platforms can create efficiency in converting inputs into sales. However, the findings of Verhoef et al. (2021) suggests that the extent of digital benefit depends on internal absorptive capacity SMEs without adequate digital skills and integration strategies may not fully capture these advantages.

The SMEs size, namely firm size (logFS) ($\beta = 0.155$, $p < 0.05$) supports the argument that larger SMEs achieve better sales efficiency due to economies of scale, stronger financial capacity, and more structured processes (Coad et al., 2014). Moreover, bigger SMEs can invest in staff training, marketing, and distribution giving them a competitive edge in sales conversion. Yet, evidence from Haltiwanger et al. (2013) also argued that small and young SMEs can outperform large ones in relative growth rates when they are more flexible and innovative. This implies that size of SMEs strengthens growth potential only when accompanied by better and effective management and digital adaptability.

The positive effect of the proportion of digital payment adoption (logDP) of total transactions ($\beta = 0.160$, $p < 0.05$) confirms that financial digitalization also keys to fostering business efficiency. Moreover, integrating online payment gateways, mobile wallets, and POS systems reduces transaction costs and increases liquidity turnover, enhancing customer convenience (Ferrantino & Koten, 2022). In the Nepalese context, where mobile banking and QR-based transactions have grown rapidly in recent times, this shift contributes to formalization and transparency of business operations. Nevertheless, limited financial literacy, inconsistent internet connectivity, and trust issues in digital systems can restrict its benefits (Hasan et al., 2017). Hence, intensity and magnitude of digital payment adoption should be reinforced through better infrastructure and training programs.



The positive relationship between age of the SMEs (logAF) ($\beta = 0.175$, $p < 0.01$) indicates that older SMEs tend to achieve higher efficiency in sales. Moreover, matured enterprises benefit from accumulated established networks, market knowledge, and process experience that contribute to steady performance (Coad et al., 2013). Yet, scholars opined that excessive maturity can lead to inertia, reducing innovation and adaptability (Evans, 1987). Therefore, while the age of SMEs signifies stability, maintaining efficiency in sales growth requires continuous innovation and openness to technological change.

Finally, among all predictors, efficiency in cost reduction (logECR) shows the strongest impact ($\beta = 0.412$, $p < 0.01$) on the sales growth, underscoring that operational efficiency remains central to sales growth. This result aligns with Porter's (2008) argument that cost leadership improves competitiveness. Likewise, efficient resource management allows SMEs to allocate savings toward market expansion and product improvement (Demirbag et al., 2006). Moreover, previous studies such as Kurniasari et al. (2023), Bouwman et al. (2018), and Gathmann and Schönberg (2010) and asserted that cost efficiency significantly enhances SMEs' financial performance by improving competitive positioning, digital payment adoption, facilitates market expansion and customer convenience, boosting sales performance in small business firm. However, Bharadwaj et al. (2013) found contrasting results and stated that without organizational readiness and strategy alignment, digital tools alone may not translate into sales or operational efficiency. Likewise, Hitt et al. (1996) and Acs and Audretsch (1990) asserted that overly large firms may suffer from bureaucratic inefficiency, reducing innovation and adaptability.

Conclusions and Policy Implications

The study finds that digital transformation (DT) has a clear and positive impact on the efficiency of sales growth of SMEs in Nepal. SMEs using advanced digital tools and payment systems attract more customers and expand their market reach, showing that DT improves both operational efficiency and responsiveness to changing consumer preferences. Firm size and age also matter, as larger and more experienced firms gain greater benefits from digital initiatives. Yet, barriers persist. Most SMEs remain at a basic level of digitization, relying on simple tools such as calculators and mobile banking. Weak internet infrastructure, high costs of digital technologies, limited technical expertise, and organizational resistance further constrain adoption. These results suggest that the advantages of DT are not automatic but depend on overcoming structural and institutional challenges. Overall, DT offers strong potential for enhancing SME competitiveness and sustainable sales growth in Nepal, providing supportive policies addressing infrastructure, costs, and digital skills.

Policy Implications

The results provide strong policy insights for fostering SME competitiveness and resource optimization in Nepal. First, DT policies should move beyond infrastructure provision to focus on enhancing the digital capability of SMEs. Hence, government and business associations can provide targeted training on e-commerce integration, digital marketing, and cybersecurity.



Second, digital payment expansion aligns with Sustainable Development Goal 9 (SDG9) that covers industry, innovation, and infrastructure. In this regard, for countries like Nepal, SDG 9 means investing in digital connectivity, local manufacturing capacity, renewable energy and so on to enhance productivity and reduce inequality between urban and rural areas.

Third, cost-efficiency strategies can be encouraged through incentives for adopting productivity-enhancing technologies such as inventory management tools, accounting software, and energy-efficient machinery. Finally, the study supports integrating digitalization and operational efficiency into the SME development policy framework in Nepal. Moreover, sustainable business growth requires that digital investments translate into real productivity and market expansion. As the regression model shows, digital tools, financial technologies, and cost management collectively determine sales efficiency. Therefore, policymakers should promote a holistic SME digitalization roadmap that combines technological, financial, and managerial capacity-building measures.

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