

# Effect of Innovation Adoption, Digital Competences and Digital Literacy on Effective Management Information System: Moderating Role of Organizational Support

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## Abstract

The current manufacturing era demands small and medium sectors to enrich and imbue digitalization at each node of supply, production, services, and operations to achieve the desired performance-related outcomes. Chinese manufacturing industries emphasize adopting and implementing the latest digitalized practices to reduce costs and increase operational efficiency and effectiveness. This study incorporated the role of innovation adoption, digital competencies, and digital literacy with the moderation effect of organizational support to explain the phenomenon of the effectiveness of management information systems. The data was collected from SME firms in China and 305 responses were analyzed on Smart-PLS. The study revealed that innovation adoption had no impact on the effectiveness of management information systems; however, competencies and digital literacy have a significant relationship with the effectiveness of management information systems. Further, no moderation effect of organizational support has been observed between innovation adoption, digital literacy and the effectiveness of management information systems. This research suggests the Chinese SME sector should increase the awareness of digitalization among employees and the general public to shift from existing practices on emerging paradigms. The study proposes to adopt and implement on a continuous basis to attain a competitive advantage. Transformation can only be placed in the presence of a suitable plan to adopt and implement digitalization. The study also records practical implications and future research avenues.

## Keywords

Effectiveness of Management Information Systems, Innovation Adoption, Digital Competencies, Digital Literacy, Organizational Support.

## 1. Introduction and Background of the Study

There are various benefits of digitization and advancement of technology. Digitization enhances performance, facilitates precise and faster production, ensure accurate implementation of strategies and higher productivity. Technological advancements significantly impact operational activities through faster processing, maintaining efficiency and effectiveness for ensuring optimal outcomes. In addition, IT capacities have enabled firms to develop modern business models according to requirements for achieving strategic objectives. Informational technology is an umbrella term that covers and encompasses emerging, rapidly developing and innovative technologies that contribute to the production, storage, manipulation, communication and dissemination of information to support electronic government services, e-commerce, e-education, e-lab and business task (Sahusilawane, 2020).



The collection of tools, equipment, procedures, systems, and people that connect for a common purpose to achieve a higher level of process, storage, and production of useful commodities and serve the organization in various perspectives is known as a management information system (MIS). It is a system that enables businesses to plan their internal operations by strategizing their business entities comprising people, documents, and technology, setting prices for products or services, and utilizing information technology for decision-making. MIS is a study of connected devices utilized by employees in firms for the collection, filtration, processing, creation and communication of data and useful information for decision-making. The latest technological equipment forms information processing systems to support organizational management activities (**Hakimpoor; Khairabadi, 2018**).

The MIS also provides facilities at different hierarchies of the firm, including top management, managers, branch managers and utilization at the operational core. By effectively utilizing of such technological equipment, and firms contribute to longevity, improvements, and profitability at the operational core. Several procedures and processes are required at the managerial level for information processing and decision-making, tactical planning to inquiry response, and management information systems for strategic policy and decisions. It assists in running the process smoothly, and it facilitates communication, information sharing and record keeping. The role of a MIS is thus not only to advise decision-makers on strategic decision making but also to provide several other facilities. It provides the risk assessment tools for organizations to conduct market analysis, budget analysis, feedback, and costing (**El-Ebiary et al., 2020**). These multiple roles of MIS are depicted in Figure 1.



Figure 1: Role of MIS.  
Source: El-Ebiary et al. (2020)

Technology has become significantly important in life and an essential element of business and other aspects of firms for achieving of effectiveness and efficiency through utilizing the latest technology developments. The purpose is to achieve efficiency and effectiveness in production and services through innovative initiatives in business and non-business units. Information technology has altered business functions such as human resource management, fixed with major terms including information, technology and communication, which consists of hardware, software and network communication. The data is processed into meaningful information that facilitates firms' management to make quick decisions regardless of time, place, size or distance (**Hamid et al., 2022**).

The revolution in the IT sector has emerged with internet-based technologies that influenced our society, economy, manufacturing and education. The significant influences of technologies on HR processes and practices have been observed and it has moved to new and modern directions. HRM department has faced great changes due to the emergence of web-based HRM systems and the replacement of existing and conventional activities. The extensive use of innovative IT solutions in HR and different sections of the firm increased the performance. It led to the standardization of diverse administrative aspects of different business units (**Marler; Parry, 2016**). The involvement of software, hardware and digital technologies has contributed to economic life and business management. The technological equipment and utilization of digital technologies instigate various strategic, effective business opportunities and integrate and respond to market situations for products and services. Digital technologies affect the workforce and working patterns, and the way of communication influences the behavior of customers and their choices. An integrated sophisticated system is required for effective business management for the achievement of competitive performance (**Ngo; Smith, 2020**).

Digital technologies are continuously changing and influencing business management. These rapid changes in the market require specific changes in the systems to cope with external changes to remain in competition and to maximize business performance. Digitalization impacts business practices and involves risk and updated information for strategic decision-making. Due to higher competition, business management faces the maximum risk of failure and is required to process the information quickly for making such strategic decisions that influence the changes. The capabilities of

digital innovativeness and the occurrence of transformation of existing practices are prime concerns for achieving organizational goals (Piccinini *et al.*, 2015).

The economic boost requires empowering technology, capital, knowledge development, quality, efficiency, and human resources with digital transformation. Extensive integration is required between digital equipment while avoiding disruption and reinvention of existing practices of business units. The opportunities must be grabbed, and challenges have to be met for the successful transformation of existing business practices with the involvement of emerging technological advancements (Litvinenko, 2020; Teece, 2018). In the Chinese manufacturing industry approximately 84.9% of firms initiated a digital transformation process for profitability achievement and productivity increments in recent years. Various challenges and limitations have been faced by firms, such as limited skills to adopt digitalization, as 24.4% of firms faced a shortage of skills, and abilities to adopt the digital transformation. Further, 14% of firms were restricted due to a lack of mindset in adopting digitalization. The firms strive to enhance the performance with two categories including the improvement of existing value volumes and the creation of new elements. Digital technologies are the external source and transformation absorbs digitalized sources to respond to dynamic industrial changes (Shen *et al.*, 2022).

The development of new products, establishing new processes, restructuring firms, business model upgradation, and offering emerging services are referred to as 'Innovation'. It has been argued that digital transformation is considered a complex process, and firms have to develop digital capabilities to take advantage of digitalization and emerging technologies (Li *et al.*, 2019). There are multiple purposes of building digital capabilities to initiate research & development activities, improve production processes, and enhance control mechanisms. Various business-related activities such as supply chain management, financial perspective and control, decision-making centered, and customer services centered influenced by the effective use of technologies. Digital innovation contributes in value creation in two categories, including increasing existing value and creating new elements (Kraus *et al.*, 2019).

Digital innovations and innovativeness enable firms to redesign processes that reduce cost, and increase efficiency at all nodes of business units, gain efficiency in the supply chain, and increase the research and development activities, production process, management and sales by effective implementation of digital technology. Digital innovation assists in initiating various elements such as products, services, new business ventures, and architectures to take advantage through the successful implementation of digital technological equipment (Endres *et al.*, 2022; Berawi *et al.*, 2020).

The term 'digital literacy' involves implementing successful digital actions required in firms to learn and leisure situations. It is the awareness, attitude, and abilities of individuals by using digital tools and facilities to identify, analyze, evaluate, manage, integrate and synthesize digital resources that help in constructing new knowledge, creating media expression and communicating among stakeholders. Further, it has been explained that digital literacy is an ongoing lifelong process. The digital literacy is considered as an integration of information technology literacy, technological literacy, information literacy, media literacy, and visual literacy (Statti; Torres, 2020). The researchers have explained the essential competencies of digital and media literacy, as shown in Figure 2. Digital literacy enables students to learn research-based skills and encourages innovation and design to address the issues, challenges and problems (Churchill; Barratt-Pugh, 2020).

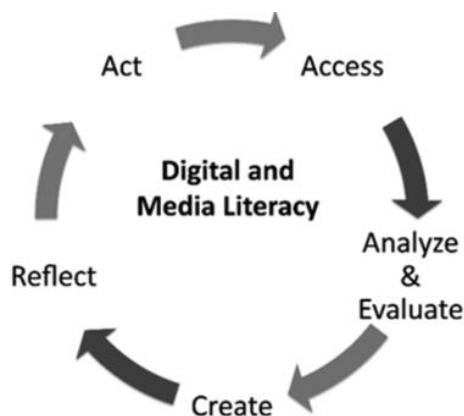


Figure 2: Competencies of Digital Literacy.  
Source: Hobbs (2017)

Figure 2 demonstrates various stages of digital and media literacy in a circular form: creation, reflection, action, access, analysis, and evaluation. In a rapidly changing business environment due to higher competition, firms strive to acquire digital competencies to face challenges and seize opportunities. The concept has been expressed in wider sense. Efforts have been made to express digital competence identified: 1) information and literacy, 2) communication and collaboration, 3) digital content creation, 4) safety and, 5) problem solving (Carretero *et al.*, 2017). The critical component for enterprises is innovation, which leads the firm to a competitive position in the market while ensuring the implementation of technological and industrial integration. Infrastructural support is necessary for economic

development through the implementation of technological developments (**Zhang et al.**, 2023). It has been reported that the Chinese SME sector faces a lack of core technologies and the digital divide further increases the resistance to adopting the latest technological development as existing practices are mature. There is a dire need for deep integration of technologies into operational activities for growth through transformation and gain required performance. digital platforms enable firms to align business ecosystems and it has gained the attention of researchers (**Maysami; Mohammadi Elyasi**, 2020).

There is a dearth of empirical studies that would determine the relationship and influence of innovation adoption, digital competencies and literacy on the effectiveness of information systems. This study thus bridges the research gap in determining the effectiveness of MIS as a great need was felt to conduct such a study. This study also intends to determine the effectiveness of MIS and IT technologies influenced by innovation adoption, digital competencies, and digital literacy.

## 2. Literature Review

### 2.1 Innovation Adoption and Effectiveness of MIS

The innovation or digital adoption has gained attention of researchers due to its crucial significance in today's highly competitive business environment. The relationship between digital technology and production performance in the manufacturing industry has realized the potential of technology adoption. Digital innovation enables firms to gain a competitive advantage. The mainstream research on digital technologies is divided into three subcategories: 1) the legal perspective of process innovation, 2) the digital technology adoption considered as a source that contributes in to the life of a firm, and 3) one that relates to incremental innovation.

The first category explains that in the manufacturing industry, digital technology adoption is an external act and technology adoption is an autonomous decision that leads to innovation. Firms opt for digital technologies as second category to enhance operational performance and excellence. The resource-based view theory emphasizes on the resources of firms utilized for attaining competitive advantage. Digital technology adoption is also considered as an internal resource that contributes in performance. The corporate strategy focuses on knowledge acquisition, creation and utilization from diverse sources for innovation (**Blichfeldt; Faullant**, 2021; **Al Doghan; Abdelwahed**, 2023; **Parbuntari et al.**, 2023). Innovation theory underpins the third category of incremental innovation. The third category has commonalities with the second category, but innovation theory emphasizes on technology adoption as an antecedent of incremental innovation.

Innovation is further divided into three subcategories: original, incremental and radical. The strategic approach of firms entails the digital adoption for radical innovation that must be supported by the appropriate capabilities that drive innovation and digital technology. Renewal of knowledge, maintenance, and stock innovation comes under incremental innovation that is aligned with digital adoption and notion of a resource-based view of the firm (**Zhang et al.**, 2021). Previously, literature has expressed the phenomenon of digital transformation performance influenced by digital technology adoption, with the mediating effect of digital dynamic capabilities and the moderation effect of digital innovation orientation. The results revealed that digital technology adoption significantly influences transformation performance, and digital dynamic capabilities mediate the relationship between digital technology adoption and transformation performance. Moreover, digital innovation orientation moderates the relationship between digital technology adoption and transformation performance and between digital dynamic capabilities and digital transformation performance (**Shen et al.**, 2022).

Additionally, firm performance has been measured on the base of market performance, and innovative performance influenced by innovation capabilities and mediated by organizational innovation, product innovation, process innovation, market innovation. The results revealed that innovation capabilities significantly influence innovations that further predict firm performance (**YuSheng; Ibrahim**, 2020). Based on the above discussion, the first hypothesis of the study was developed.

H1: Innovation adoption tends to predict the effectiveness of information systems.

### 2.2. Digital Competencies and Effectiveness of MIS

A lot of changes have taken place with the latest rapid developments in digital technologies and their application in formal settings (**Heidari et al.**, 2023). Several emerging and affordable technologies are available in the world that are associated with digital informal learning that increase performance based on digital competencies (**Hubbard**, 2019). Digitalization is considered as a key competency for learning and is supported by digital literacy. The higher the literacy, the stronger is the competency which leads to higher performance-related outcomes. Importantly, previous studies have highlighted the role of culture in adopting digital competencies and performance. Previous studies have incorporated the role of culture as a mediator between digital competency and information learning (**Han; Yi**, 2019). Further, it has been reported that digital competencies have a positive relationship with performance; moreover, it has

been stated that there is a lack of research evidence to examine the relationship between digital competency and performance (**Pagani et al.**, 2016). Digital competency enables firms to utilize electronic media for information acquisition and acquire cyberspace; it also enables firms to enhance the communication between stakeholders and social media (**van Laar et al.**, 2017).

Digital competencies have gone through various stages namely, Digcomp 1.0, 2.0, and 2.1 that address the improvement in citizen's digital competence, consisting of five dimensions, information and literacy, communication, collaboration with the creation of digital content, safety, and problem-solving techniques. Digital competencies have eight proficiency levels including knowledge acquisition, skills, and attitudes (**Carretero et al.**, 2017; **Abdullah et al.**, 2022; **Escandell-Poveda et al.**, 2022). Previous literature has embarked on the relationship between digital competencies and performance with the mediating effect of digital informal learning. The results have revealed that digital competencies influence informal learning and lead to performance as an indirect effect significantly (**Mehrvarz et al.**, 2021). Another research effort has been made on the relationship between digital competency belief, and behavioral intention with mediating effects of perceived usefulness and perceived ease of use. The study revealed a significant relationship between digital competencies and behavioral intention (**Antonietti et al.**, 2022). The international digital competence has been focused on by prior literature that predicts the expansion and non-equity investments with the moderation role of international orientation (**Cahen; Borini**, 2020). Thus, this discussion leads to development of the second hypothesis of the study.

H2: Digital competencies tend to predict the effectiveness of information systems.

### 2.3. Digital Literacy and Effectiveness of Management Information Systems

The application of digital technologies to support the economy and society is expressed as digitalization, which can become more complex by adding new challenges for transforming existing practices. During the COVID-19 period, firms faced complex situations in adopting emerging technologies to cope with rare scenarios and execute operations according to new technological-based practices. Technological adoption is a major challenge for firms to execute operations according to new practices and a shift from traditional to emerging practices (**Iivari et al.**, 2020). Literacy is the number of competencies, knowledge, and skills possessed by individuals who perform tasks at the workplace while interacting with others. Employers strive to hire a workforce with a higher degree of literacy, such as information literacy, digital literacy and media literacy (**Collard et al.**, 2017). Literacy is an essential element of personal attributes in the digital age, the efficient transformation requires a literate workforce that can perform tasks to achieve performance and evaluate productive employees (**Bowen; Johnson**, 2019; **Razzaiq et al.**, 2022).

The abilities of individual employees to recognize the situation where and when the information is required to take the initiative for locating, evaluating, assessing, analyzing, and effectively using of such information for decision-making in formal or informal contexts at the workplace. Digital literacy is referred as the ability of utilize information and communication technologies at appropriate places and times with accurate measures while using technical skills to achieve organizational performance. information literacy relates to information processing, while digital literacy is related to the awareness, attitude, and abilities for proper utilization and interaction through digital technologies for effective outcomes in a digital environment (**Cetindamar Kozanoglu; Abedin**, 2021). Digital literacy is considered as critical for establishing the dynamic capabilities for ensuring the digital transformation based on skills to acquire knowledge, perception and attitudes (**Gui; Argentin**, 2011; **Lin; Zhang**, 2024; **Dung; Hoa**, 2023; **Jeyaraman et al.**, 2022).

The intention to use digital technologies has been assessed to be influenced by information and digital literacy, perceived ease of use, perceived usefulness and attitude towards digitalization. The study established that information and digital literacy can influence in the intention to use digital technology in the presence of perceived ease of use and perceived usefulness (**Nikou et al.**, 2022). Another study has reported that digital literacy is multidisciplinary that embraces the literacy, information and communication technologies, proficient computer skills, science, health, nursing, and language education. Digital literacy enables professionals to act distinctively at the workplace (**Park et al.**, 2021). Previously, no research has been conducted before to assess the empirical relationship between digital literacy and effective management information systems. Hence, the third hypothesis of the study was devised.

H3: Digital literacy tends to predict the effectiveness of information systems.

### 2.4. Moderating Effect of Organizational Support

This study incorporated the moderating variable of organizational support, which is necessary for achieving performance-related outcomes. Organizational support is defined as the perception of employees about the employer's support that is being received. Organizational support contributes to the well-being of employees and found to be effective in enhancing the sense of obligation that leads to organizational objectives. Organizational support assists in achieving creativity, increasing job satisfaction, better customer orientation, job performance, and reducing employee turnover (**Vatankhah et al.**, 2017). It has been previously identified that support from a firm reduces job stress, enables effective utilization of resources, motivates positive affectivity and self-efficacy that leads to organizational success

(Hobfoll *et al.*, 2018). Organizational support can reinforce sense of employees to control and alleviate feelings of job insecurity (Bohle *et al.*, 2018).

Previous studies have explained the phenomenon of emotional exhaustion influenced by the fear of COVID, job insecurity and mindfulness, with the moderating role of organizational support. The study revealed that organizational support moderates the relationship between job insecurity and emotional exhaustion (Chen; Eyoun, 2021). Another research study has been conducted to assess the relationship between organizational virtuousness and employee well-being, between organizational virtuousness and performance, and between organizational support and employees' well-being and performance. The results revealed that organizational support predicts performance and employee well-being significantly (Setyoko *et al.*, 2022).

This study claims that digital implementation and transformation cannot be successful without management support. Previously, studies have explained the moderating role of organizational support; hence, the following hypotheses are stated:

H4: Organizational support moderates the relationship between innovation adoption and effectiveness of information systems.

H5: Organizational support moderates the relationship between digital competencies and effectiveness of information systems.

H6: Organizational support moderates the relationship between digital literacy and effectiveness of information systems.

### 3. Research Framework

The research framework demonstrated in Figure 3 presents the hypothesized relationships between the constructs of the study.

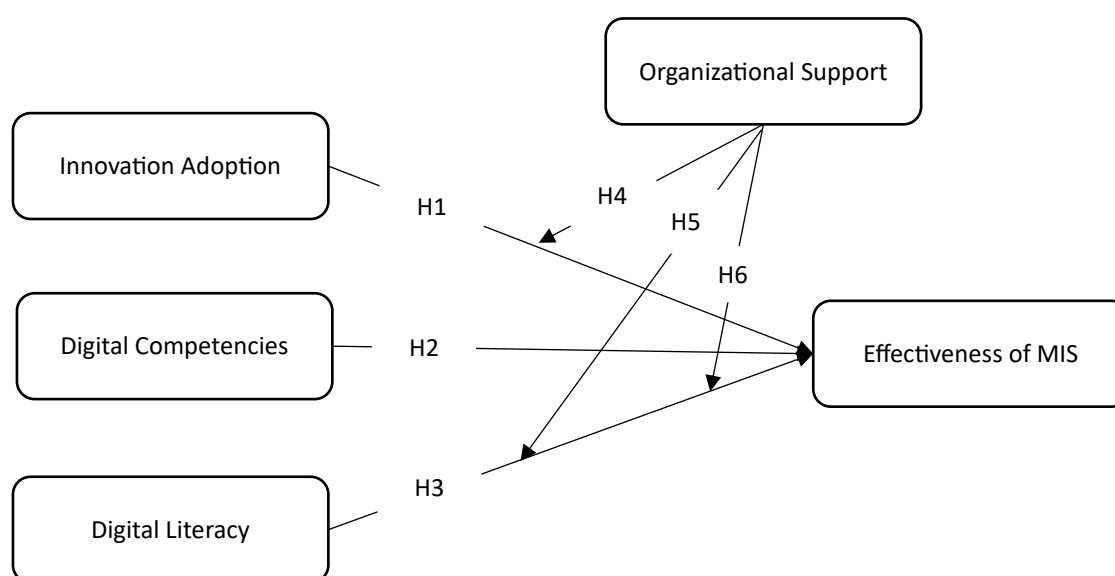


Figure 3: Research Framework.

### 4. Research Methodology

This study utilized a cross-sectional research design as quantitative data was collected from the respondents. The study intends to assess the effectiveness of information systems influenced by innovation adoption, digital competency and literacy with the moderating effect of organizational support. Digitalization is taking place in the SME sector of China, and has been reported that there is a lack in adoption and effectiveness of digitalization at SME sector of China. Hence, there was a dire need to conduct the research of SME sector of China. For this purpose, SMEs in East and West China were considered and four hundred questionnaires were distributed to collect maximum responses. A simple random sampling technique was employed for collecting data. The research methodology had been employed previously by Nguyen Thi Xuan and Tuyen (2021) and Rupeika-Apoga *et al.* (2022).

The measurement scale for each variable was adopted from previous studies, and were measured on the 5-point scale. The 8-item measurement scale of organizational support was taken from the research article of Chen and Eyoun (2021). The 6-item measurement scale of innovation adoption was taken from Shen *et al.* (2022). The 10-item scale of digital literacy was adopted from the study of Nikou *et al.* (2022). The 11-item measurement scale of digital competency was taken from research study of Mehrvarz *et al.* (2021). A 3-item measurement scale of effectiveness of management systems is taken from the study of Wulandari *et al.* (2021).

## 5. Results and Discussion

### 5.1. Measurement Model Assessment

This phase assesses the constructs' reliability and validity, Cronbach alpha, composite reliability and average variance extract (AVE). The values for Cronbach alpha, and CR must remain higher than 0.70 for minimum acceptable reliability. The value for AVE must remain higher than 0.50 to achieve convergent validity (Hair Jr et al., 2014). Table 1 presents the reliability and validity of constructs showing them all within acceptable values.

Table 1: Measurement Model Assessment.

S#	Constructs	Alpha	CR	AVE
1	Effectiveness of MIS (Eff_MIS)	0.839	0.904	0.758
2	Innovation Adoption (IA)	0.931	0.947	0.750
3	Digital Competency (DC)	0.910	0.924	0.525
4	Digital Literacy (DL)	0.936	0.945	0.635
5	Organizational Support (OS)	0.906	0.926	0.614

The values in Table 1 satisfy the required limits of alpha, CR and AVE. Hence, all constructs achieved the reliability and validity. Figure 4 demonstrates the measurement model assessment.

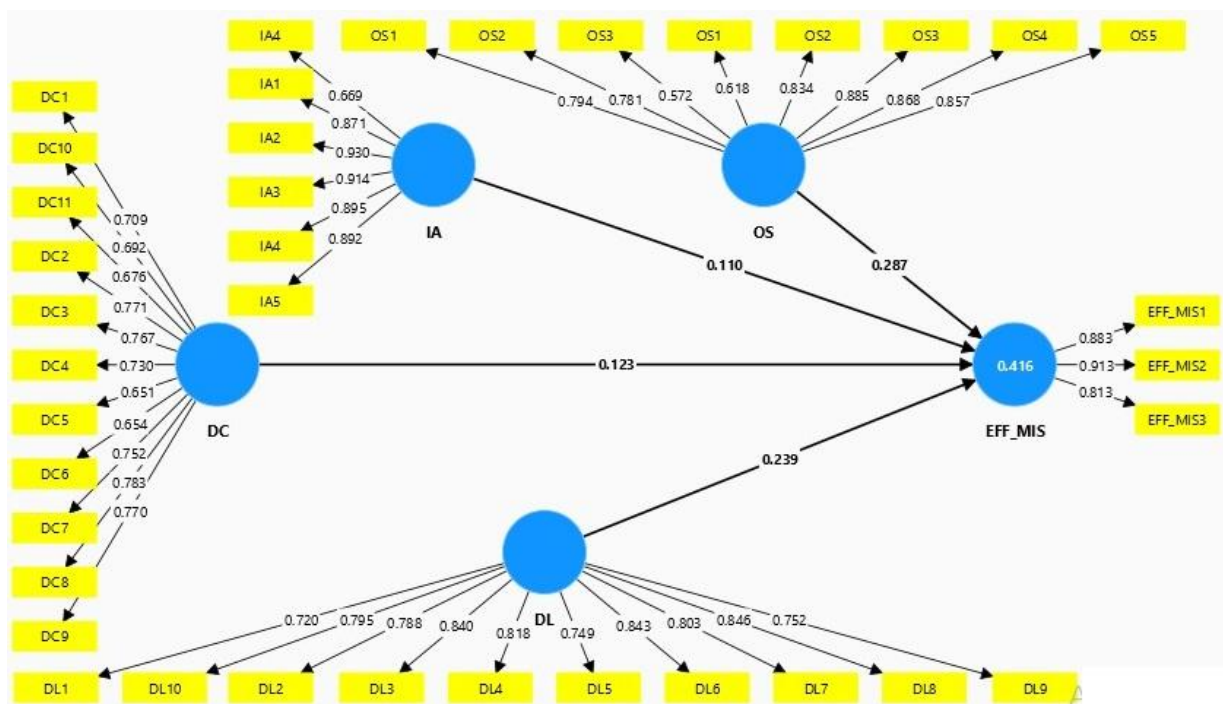


Figure 4 Measurement Model Assessment.

Note: Eff\_MIS: Effectiveness of MIS; IA: Innovation Adoption; DC: Digital Competency; DL: Digital Literacy; OS: Organizational Support

### 5.2. Discriminant Validity

The discriminant validity is determined on **Fornell and Larcker** (1981) criteria. The criteria suggest that the square root of AVE must be higher than the correlational values with other variables. Table 2 suggests that discriminant validity was achieved according to the suggested criteria.

Table 2: Discriminant Validity.

Constructs	DC	DL	EFF_MIS	IA	OS
DC	0.725				
DL	0.586	0.797			
EFF_MIS	0.466	0.560	0.871		
IA	0.477	0.533	0.507	0.866	
OS	0.523	0.663	0.591	0.737	0.784

Note: Eff\_MIS: Effectiveness of MIS; IA: Innovation Adoption; DC: Digital Competency; DL: Digital Literacy; OS: Organizational Support

### 5.3. Structural Equation Model (SEM)

This section investigates the hypothesized relationship as shown in Figure 3 research framework.

The hypothesized relationships are investigated using the bootstrapping method of PLS and assessed on the base of  $\beta$ ,

t-value and p-value. The t-statistics must be higher than 1.96 for acceptable significance with 5% error margin (Hair Jr *et al.*, 2021). Table 3 demonstrates the results of direct hypothesized relationship.

Table 3: Hypothesized Relationship Test.

S#	Relationships	$\beta$	t-value	p-value
H1	IA→EFF_MIS	0.171	1.798	0.072
H2	DC→EFF_MIS	0.145	1.962	0.049
H3	DL→EFF_MIS	0.195	2.500	0.012
H4	IA*OS→EFF_MIS	0.045	0.648	0.517
H5	DC*OS→EFF_MIS	0.183	2.450	0.014
H6	DL*OS→EFF_MIS	0.004	0.048	0.962

Note: Eff\_MIS: Effectiveness of MIS; IA: Innovation Adoption; DC: Digital Competency; DL: Digital Literacy; OS: Organizational Support

## 5.4. Description

Hypothesis 1: This hypothesis investigates the relationship between innovation adoption and the effectiveness of management information systems. The study argues that technological adoption and implementation of the latest systems increase performance-related outcomes. The results revealed that innovation adoption has an insignificant relationship with the effectiveness of management information systems. That means the adoption of the latest technological systems is not enough; successful implementation is required to the achievement of goals. The findings of the study contradict previous study that reported a significant relationship between innovation adoption and performance (Shen *et al.*, 2022).

Hypothesis 2: The second hypothesis examined the relationship between digital competencies and the effectiveness of MIS, it has been stated that employees' competence adopting and implementing the latest technological systems for operational efficiency and gaining competitive advantage are necessary. The results revealed that digital competencies tend to predict the effectiveness of MIS significantly. This suggests that in the presence of digital competencies it becomes suitable for attaining competitive edge and effectiveness. The study is aligned with the finding of the previous study conducted by Mehrvarz *et al.* (2021).

Hypothesis 3: Digital literacy influences the performance-related outcomes. This study intends to investigate the relationship between digital literacy and the effectiveness of MIS. The result revealed that digital literacy is essential in attaining the effectiveness of MIS. The t-value was higher than the cutoff point of 1.96, and the p-value is lower than 0.05, which means the relationship is statistically significant.

Hypothesis 4: Hypothesis H4 investigated the moderation effect of organizational support between innovation adoption and the effectiveness of MIS. This study argues that organizational support is necessary for performance and organizational success. The prior literature has reported that organizational support is required to achieve the goals. The results of the hypothesized relationship test reported an insignificant moderation effect of organizational support between innovation adoption and the effectiveness of MIS. The innovation adoption is not enough to influence the effectiveness of MIS; further, organizational support has no moderating effect on the relationship between innovation adoption and the effectiveness of MIS.

Hypothesis 5: The moderating effect of organizational support is also examined between the relationship of digital competencies and the effectiveness of MIS. Digital competencies are necessary for performance, and the result of this hypothesis reported the significant moderation effect of organizational support on the relationship between digital competencies and the effectiveness of MIS.

Hypothesis 6: This hypothesis examined the moderation effect of organizational support on the relationship between digital literacy and the effectiveness of MIS. The results revealed that organizational support has no moderation effect. Digital literacy is not sufficient to increase performance, but organizational support is necessary and the intention to implement and utilize the latest technologies has to be incorporated for the effectiveness of MIS to be achieved.

## 7. Conclusion Implications and Future Research Avenue

Digital technologies are essential sources for organizations and powerful tools to compete in the digital era. Digitalization has become a necessity in today's competitive world that requires the latest innovative initiatives for the achievement of organizational goals. This research effort has been made to determine the effectiveness of management information systems influenced by innovation adoption, digital competencies, and digital literacy. The study also incorporated the organizational support that has central importance in determining performance-related outcomes. The simple random sampling technique was employed for data collection, and examined on the SMART-PLS. The results revealed that innovation adoption has no direct effect on the effectiveness of management information systems, but significant relationships have been depicted between digital competencies and the effectiveness of management information systems, and between digital literacy and the effectiveness of management information systems. Further, there is no moderation effect of organizational support between innovation adoption and the effectiveness of management



information systems, and no moderation effect has been reported between digital literacy and management information systems. However, a significant moderation role of organizational support has been reported in the relationship between digital competencies and the effectiveness of management information systems. The SME sector should focus on specific technologies that can be implemented to achieve the goals.

This study has various suggestions to achieve the required outcomes related to the effectiveness of adopting and implementing the digital technologies. The SME sector in China is lacking in digitalization and facing various issues and challenges in adoption and implementation of technologies for transformation of operations to sustain the advantage. The firms should take strict measures in selection of technologies and innovative initiatives that must be effective in achieving the goals. Innovation adoption must be prime concern of the firm to achieve the performance and the effectiveness of the systems. Moreover, there is a dire need to develop the digital competencies and need to enhance the capabilities of employees to align with existing systems to gain the required objectives. Digital literacy is an essential element that has great impact on performance and the effectiveness. Hence, there is need to conduct the training sessions for increasing the literacy related to latest available technologies.

Future research studies may be conducted on continuous basis and longitudinal perspective to assess the role of technologies, adopting various other variables such as role of different constructs in different operations. The role of technologies in supply chain, operations, and management functions.

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