

## The role of digital literacy and knowledge management on process innovation in SMEs

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### ABSTRACT

Research on digital literacy, knowledge management and process innovation variables has not been widely carried out in Indonesia, therefore more studies need to be carried out immediately since small and medium enterprises (SMEs) play an important role in economic activities. The purpose of this research is to investigate the effect of digital literacy on knowledge management, digital literacy on process innovation and financial management on process innovation. The research method is quantitative using partial least square structural equation modeling (SEM) analysis with data analysis tools using SmartPLS 3.0 software. The study involved 489 respondents who owned SMEs and it was determined using simple random sampling. The type of variable scale used is the ordinal scale. The rating scale for each statement uses a rating scale technique with a Likert scale type. Online questionnaires are distributed through online media, the data analysis stage is the outer model test, namely the validity and reliability test and the inner model test, namely the hypothesis test or significance test. The independent variable of this research is digital literacy, the mediating variable is knowledge management, and the dependent variable is process innovation variable. Based on the results of research data analysis it was found that digital literacy had a positive and significant relationship on knowledge management, digital literacy had a positive and significant relationship on process innovation, knowledge management had a positive and significant relationship on process innovation. Knowledge management played as full mediators in the relationship between digital leisure variables and process innovation.

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## 1. Introduction

Knowledge management has become the focus of organizational development as a strategic means of creating innovation and competitive advantage (Bastidas et al., 2023). Various studies have shown that knowledge management is an important factor for achieving superior organizational performance. Knowledge management is defined as a framework for designing organizational strategies, structures, and processes so that an organization can use what it knows to learn and to create economic and social value for its customers and communities (Awad, 2007). Organizations need a good capacity to maintain, develop, manage and utilize the abilities of their employees in order to remain at the forefront and have an advantage over competitors (McInerney, 2002). Knowledge management is considered an important feature for organizational survival, while the key to understanding the success and failure of knowledge management in organizations is the identification of resources that enable organizations to recognize, create, transform and distribute knowledge. Organizations that effectively manage and transfer their knowledge are more innovative and perform better (Fathullah et al., 2023).

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Binsaeed et al. (2023) found that human resource management has a positive influence on knowledge management. De Bem et al. (2022) state that there is a strong correlation between human resource management and knowledge management and knowledge management can be considered as a form of human resource management development. In this connection, human resource management is responsible for task monitoring, measuring, and intervening in the building, assimilation, dissemination, and use of knowledge. Human resource management concerns the effective management of people. If people are the most valuable source of knowledge, resource management and knowledge management are closely related. Getting people used to using digital financial or banking products and services requires awareness of digital literacy (Cetindamar et al., 2021). One of the challenges of digital literacy is contextual understanding of the risks and benefits. Increasing awareness of financial literacy and digital literacy is important so that people would not fall into the trap of fake digital banking and fake financial services (Nurnaninsih & Muthmainah, 2023).

The era of globalization has brought changes to the business environment and increased competition (De Bem et al., 2022). Every business is required to be able to innovate so that the products produced can be accepted by consumers. Currently, global competition and increasing productivity are important issues to discuss if we plan to achieve competitive advantage and be able to compete in similar business fields. In achieving a competitive advantage, the role of human resources greatly influences the results and goals to be achieved by the company. Human resources that are good and in accordance with the company's criteria will be able to produce interesting ideas for the company. Every employee in the company is required to be able to innovate according to needs and relies on creativity without reducing the resulting performance. Boroujerdi et al. (2019) argue that innovation is a core need for business organizations in achieving competitive advantage. Human resources that create innovation. Companies must pay attention to the development of human resources. A company that gains a competitive advantage over its competitors must sustain innovation. Employees are very important in the innovation process because they greatly affect performance (Liao et al., 2007).

Mansur (2022) states that digital literacy creates entrepreneurial innovation capabilities, and it has an impact on entrepreneurial performance. Innovation strengthens the mediation between digital literacy and entrepreneurial performance. Innovation can be one of the key success factors that can help differentiate products, beat competition, and attract more customers (Islam et al., 2017). Digital literacy touches and includes many things that are not claimed to be its own, it includes the presentation of information, without including creative writing and visualization (Jarmooka et al., 2021). It covers the evaluation of information, without claiming systematic reviews and meta-analyses as its own, covers the organization of information but does not claim the construction and operation of terminology, taxonomies.

## **2. Literature Review and Hypothesis Development**

### *2.1 Digital literacy*

Digital literacy is a skill and ability that everyone has in searching, accessing, sorting, using, compiling, and disseminating new information that they get to the public using digital devices (Gilster & Glister, 1997). According to Liao et al. (2007), there are four abilities and skills in developing literacy skills, namely first, searching the internet, evaluating the information and the preparation of information. Digital competence and digital literacy are concepts that are increasingly being used in public discourse, although they still find intersections and similarities with other areas of literacy. Digital literacy is defined as a broader and more complex set of skills than the simple use of digital technologies, most importantly the need to contextualize the internet and ways of presenting information to other non-networked forms (Martin & Grudziecki, 2006). Grouped digital literacy indicators, including operational and technical, digital information and communication, digital and strategic content creation. Digital skills can enhance information and communication technology (ICT) use, social media transformation and engagement, competitiveness, and organizational performance in SMEs. According to Latifah et al. (2022), digital literacy can be said to be the ability to understand and use information in various formats from various sources, which emphasizes certain cognitive challenges associated with the ability to integrate analog and digital media. Koltay (2011) conducted a review of the concept of digital literacy from many articles and found intersections and similarities with other literacy fields, such as information literacy and computer literacy. However, Kucharska and Erickson (2023) mentioned that digital competence links adaptability and innovation through various digital media that anyone can access and use according to context and purpose, where the ability to create and exploit knowledge includes economic literacy, economic literacy, financial literacy. Digital literacy plays an important role in determining the position and behavior of individuals, business actors and even better companies in the era of globalization which will continue to digitize various aspects of life.

Digital literacy is the ability to use technology and information from digital devices effectively and efficiently in various contexts such as academics, careers, and everyday life. Mansur (2022) states that digital literacy in a business context is the ability to access trusted business information sources digitally, build business information from various trusted sources, think critically, and analyze this information, awareness of the importance of conventional media and linking it with the media. Digital literacy should be more than the ability to use digital resources effectively. Digital literacy is also a particular way of thinking (Kosklin et al., 2023). Digital literacy is explained as the ability to understand and use information in various formats. The concept of literacy is not only about the ability to read but also reading with meaning and understanding. Digital literacy includes mastery of ideas, not keystrokes. Gilster and Glister (1997) emphasize critical thinking processes when dealing with

digital media rather than technical competence as a core skill in digital literacy, as well as emphasizing the critical evaluation of what is found through digital media rather than the technical skills needed to access digital media.

## 2.2 Knowledge Management

Knowledge management is defined as the process of creating, capturing, codifying, storing, sharing, distributing, and using knowledge effectively in an organization (Swan et al., 1999). Good knowledge management allows organizations to learn from mistakes and successes that occur in organizational/company operations (Tohara, 2021). Knowledge management is also able to maintain key knowledge that an organization has, such as technical knowledge, operational standards, and best practices. A knowledge management system is designed and developed to help parties in an organization identify, share, retrieve and use knowledge. Knowledge Management is the access to skills, knowledge and expertise that provides new capabilities, enables better performance, drives progress and innovation, and increases customer value. According to Xin et al. (2022) knowledge management is a management function that creates knowledge, manages the flow of knowledge and ensures that knowledge is effectively and efficiently used for the long-term interests of the organization. Knowledge Management aims to find, store, share and widely share the very important resources owned by an organization. Knowledge management indicators include People, leadership, internet technology, organization, and learning (Latifah et al., 2022). The application of knowledge management is proven to improve university performance as measured by teaching performance, research performance and community service performance.

## 2.3 Process Innovation

Process innovation is defined as a new element introduced in the operation of products and services within a company, such as raw materials, task specifications, mechanisms, or equipment used to produce products or services (Pisano, 1997). Process innovation is measured by developing production process methods, adding new service processes, making improvements to production processes, having good facilities for production processes, developing quality and business processes, optimizing production, ease of viewing from a distance normal view/visibility, location close to the center of the crowd, and availability of parking lava. Process innovation is a tool, device and knowledge in technology that mediates between input and output innovation and describes changes in the way the organization produces the final product or service of the company (Fritsch & Meschede, 2001). Process innovation is the process of improving or renewing production methods which will encourage a reduction in unit production costs. According to Kucharska and Erickson (2023), process innovation is the process of improving or renewing production methods which will encourage a reduction in unit production costs. In carrying out process innovation there are three important factors in implementing process innovation: quality, cost and time. Quality is the ability of a product to meet consumer expectations, cost is the overall production cost and time is the accuracy between production and marketing times. A company's innovation strategy is integrated in considering product and process innovation, this is why process innovation is sometimes linked to product innovation. The innovation process aims to reduce costs and increase supply chain and demand chain activities. Process innovation can also help in improving the relative quality of a product and reducing costs, thereby increasing the relative value of the product and service. Process innovation is the implementation of production or process methods that are completely new or significantly improved. Significant changes in terms of technique, equipment and/or software. Process innovation is useful for reducing production costs and for satisfying its customers. Process innovation describes a change in the way an organization produces a company's final products and services.

## 3. Development hypothesis

### 3.1 The relationship between digital literacy and knowledge management

According to Melhem et al. (2023), digital business transformation is an objective process that responds to changes in the business environment. Digital transformation is the use of digital technology to fundamentally increase a company's productivity and value. Successful Digital Transformation requires the organization and the actors involved to have digital literacy readiness and develop various capabilities according to the business context and needs. In the current era of the renewable economy, the focus of business actors and their personnel from industries that are actively competing around the world puts pressure on to go digital before others do, strive for survival, and achieve competitive advantage. Digital transformation is closely related to: (1) the use and alignment of digital technology within a company, (2) carrying out organizational changes, (3) enabling activities, (4) creating and capturing new opportunities and value. Radicic and Petković (2023) found that digital literacy has a positive and significant relationship to knowledge management, therefore in this study the following hypothesis were arranged:

**H<sub>1</sub>:** *Digital literacy has a positive and significant relationship to knowledge management.*

### 3.2 The relationship between digital literacy and process innovation

Rehman et al. (2021) explained that apart from the art of critical thinking, the competencies needed are learning how to structure knowledge, as well as building a collection of reliable information from several different sources. Someone who is digitally literate needs to develop the ability to search and develop a strategy in using search engines to find existing information and how to find information that fits their information needs. Digital literacy does not only involve the ability to use applications or operate digital devices, it includes a set of cognitive, psychomotor and emotional skills that individuals need in a digital environment. The Internet, mobile phones, other contemporary technologies are new ways to describe the business

world. Digital literacy is not only related to expertise in accessing information but in a broader context, digital literacy is a life experience and becomes part of a living culture. Othman and ElKady (2023) found that digital literacy has a positive and significant relationship to process innovation, therefore in this study the following hypothesis is proposed:

**H<sub>2</sub>:** *Digital literacy has a positive and significant relationship to process innovation.*

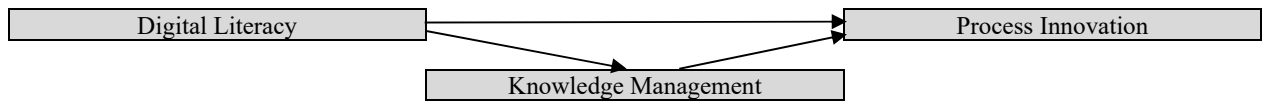
**3.3 The relationship between knowledge management and process innovation**

Knowledge Management aims at discovering, storing, sharing very important resources owned by an organization. Knowledge management indicators include Humans, leadership, internet technology, organization, and learning. The implementation of knowledge management processes plays a very important role for small and medium enterprises (SMEs). The application of knowledge management is proven to increase university performance as measured by teaching performance, research performance, and community service performance. Within the context of SMEs, effective knowledge management can facilitate organizations to achieve superior performance. Therefore, in this research the following hypothesis is formulated:

**H<sub>3</sub>:** *Knowledge management has a positive and significant relationship to process innovation.*

**4. Method**

This research method is quantitative using partial least square structural equation modeling (SEM) analysis with data analysis tools using SmartPLS 3.0 software. This research involved 489 respondents who owned SMEs who were determined using simple random sampling and were given the obligation to fill out each statement. The type of variable scale used is the ordinal scale. The rating scale for each statement uses a rating scale technique with a Likert scale type. The measurement scale values used are from 1 to 5, the values for each scale indicate: 1=Strongly Disagree; 2=Disagree; 3= Don't Know; 4 = Agree; 5=Strongly Agree. The online questionnaire is distributed via online media. The stages of data analysis are the outer model test, namely validity and reliability testing and the inner model test, namely hypothesis testing or significance testing. The independent variable of this research is digital literacy, the mediating variable is knowledge management, and the dependent variable is the process innovation variable.

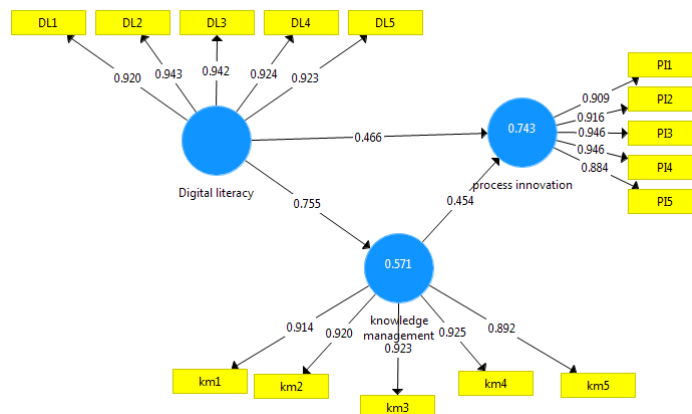


**Fig. 1.** Research Model

**5. Results and Discussion**

**5.1 Convergent Validity**

Measurement of the variable model is a step for seeing the validation and reliability of indicators in the model. A model declared valid if it has a loading factor above 0.7 or in other words a lower loading factor of 0.7 should be on drop from the model, while the reliability test is seen from the composite reliability, if the value is more than 0.7 then it shows value which is satisfying and further strengthened by looking at Cronbach’s alpha it is recommended to have a value above 0.6. Fig. 2 shows the results of the convergent validity.



**Fig. 2.** Validity Testing

The figure above shows that only the loading factor has a value greater than 0.7 so that it can be said that it meets convergent validity.

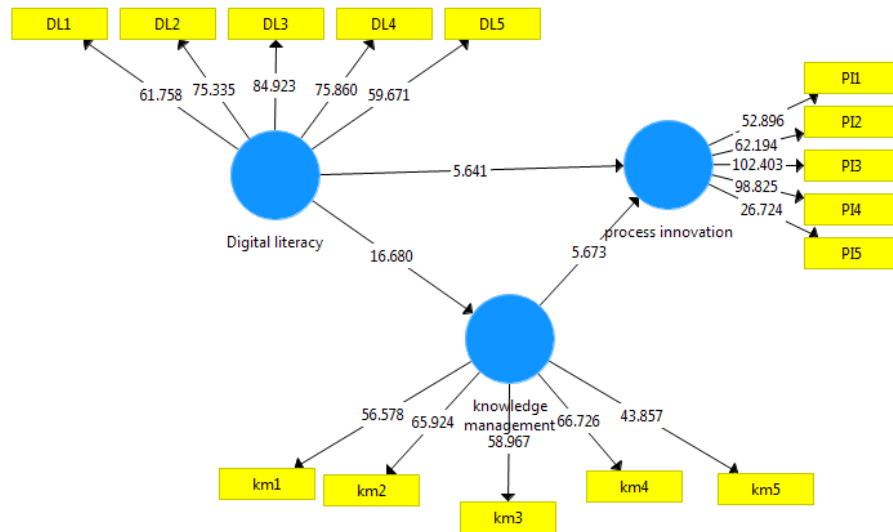
**Table 1**  
The results of the reliability test

	Cronbach's Alpha	rho A	Composite Reliability	Average Variance Extracted (AVE)
Digital Literacy	0.908	0.918	0.943	0.765
Knowledge management	0.854	0.842	0.909	0.634
Process Innovation	0.954	0.945	0.942	0.608

Table 1 above shows that the composite value reliability of all variables above 0.7 and Cronbach’s alpha value all variables are above 0.6, so all research variables has been shown to be a fit measure, this is meaningful that all question items will be used for measuring a variable is reliable.

5.2 Hypothesis testing

Hypothesis testing in PLS is based on the values contained in structural model analysis, the level of significance of the path coefficient is obtained from the t-statistic value and the standardized path coefficient value. Limit value hypothesis testing, namely the t-value of the factor loadings is greater than the critical value ( $\geq 1.96$ ).



**Fig. 3.** Hypothesis Testing

**Table 4**  
Hypothesis Testing

Correlation	T Statistics	P Values
Digital literacy and knowledge management	16.680	0.000
Digital literacy and process innovation	5.641	0.000
Knowledge management and process innovation	5.673	0.000

5.3.1 The relationship between digital literacy and knowledge management

According to the results of data analysis using structural equation modeling (SEM) partial least squares (PLS), a p value of 0.000 was found and the path coefficient was positive so that it was concluded that digital literacy has a positive and significant relationship to knowledge management. The results are consistent with the findings of Radicic and Petković (2023), Sharma (2019) and Nwankpa et al. (2022) who stated that digital literacy has a positive and significant relationship significant to knowledge management.

5.3.2 The relationship between digital literacy and process innovation

According to the results of data analysis using structural equation modeling (SEM) partial least squares (PLS), a p value of 0.000 was found and the path coefficient was positive, so it was concluded that digital literacy has a positive and significant relationship to process innovation. According to research conducted by Jiang et al. (2023), Reinhardt (2023) and Sharma (2019), literacy digital has a positive and significant relationship to process innovation, which confirms our result.

### 5.3.3 The relationship between knowledge management and process innovation

According to the results of data analysis using structural equation modeling (SEM) partial least squares (PLS), a p value of 0.000 was found and the path coefficient was positive, so it was concluded that financial management has a positive and significant relationship to process innovation. According to research conducted by Reinhardt (2023) and Sharma et al. (2019) knowledge management has a positive and significant relationship to process innovation.

## 6. Conclusion

Based on the results of research data analysis it was found that digital literacy has a positive and significant relationship to knowledge management, digital literacy has a positive and significant relationship to process innovation, knowledge management has a positive and significant relationship to process innovation. Knowledge management variables were full mediators in the relationship between digital leisure variables and process innovation. The novelty of this research has been the creation of a correlation model among digital literacy variables, knowledge management and process innovation in SMEs.

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