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Submission ID: 3223

Title: Technopreneuship Contribution on creative Industry Performance

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Topic(s):

- Social media science
- Data mining tools and techniques
- Network analysis
- Data processing
- Data visualization
- Architectures for massively parallel processing
- Cloud computing platforms
- Distributed file systems and databases
- Data capture and storage
- Search, sharing, and analytic

Keywords: Technopreneurship; Innovation; Information Technology; Business Performance

Abstract: The purpose of this study was to analyze the role of Technopreneurs in supporting the productivity of small and medium industry (SMEs). The effect of innovation on small and medium industry business performance, the influence of Information Technology on industry performance, and the role of Information Technology in mediating innovation on business performance were tested in this study. Data were collected using an online questionnaire. A total of 347 questionnaires were sent to the business owner of SMEs in Bali province. This study used structural equation modeling analysis with partial least square (PLS) software to analyze three research problems. The result of the analysis shows that: 1) innovation has a

positive effect and is significant on business performance; 2) innovation has a positive effect and is significant on IT; 3) Information Technology has a positive effect but does not significant on business performance. 4) Information technology does not mediate the relationship between innovation and performance. The result of the analysis also shows that the three dimensions of innovation, namely product innovation, process innovation and distribution innovation are able to significantly shape the innovation construct. The implication of this research is that innovation plays an important role in improving business performance.

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# Technopreneuship Contribution on creative Industry Performance

*by* Putu Ngurah Suyatna Yasa

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**Submission date:** 04-Apr-2024 07:28PM (UTC+0700)

**Submission ID:** 2339745287

**File name:** ijdns\_2024\_Technopreneurship.docx (99.49K)

**Word count:** 7615

**Character count:** 43288

## Technopreneurship Contribution on creative Industry Performance

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### CHRONICLE

*Article history:*

Received: Maret 1, 2024

Received in revised format: Mei 25, 2024

Accepted: June 16, 2024

Available online: July 16, 2024

*Keywords:*

Technopreneurship

Innovation

Information Technology

Business Performance

### ABSTRACT

The purpose of this study was to analyze the role of Technopreneurs in supporting the productivity of small and medium industry (SMEs). The effect of innovation on small and medium industry business performance, the influence of Information Technology on industry performance, and the role of Information Technology in mediating innovation on business performance were tested in this study. Data were collected using an online questionnaire. A total of 347 questionnaires were sent to the business owner of SMEs in Bali province. This study used structural equation modeling analysis with partial least square (PLS) software to analyze three research problems. The result of the analysis shows that: 1) innovation has a positive effect and is significant on business performance; 2) innovation has a positive effect and is significant on IT; 3) Information Technology has a positive effect but does not significant on business performance. 4) Information technology does not mediate the relationship between innovation and performance. The result of the analysis also shows that the three dimensions of innovation, namely product innovation, process innovation and distribution innovation are able to significantly shape the innovation construct. The implication of this research is that innovation plays an important role in improving business performance.

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### 1. Introduction

Indonesia's digital economy is the highest in ASEAN and will continue to grow up to 12% every year. The adoption of digital technology for MSMEs is targeted in the 2020-2024 National Medium Term Development Plan (RPJMN) at 30.9%. "The benefits of digitalization for MSMEs are such as increasing sales, effective operations, reducing costs, and market expansion. There are many regions that have superior products, but many of the digitalization processes have not been touched. MSMEs have a strategic role, but still have challenges such as financing, readiness digital, and marketing. Starting in 2020, total annual spending on the digital market will be dominated by beauty products, followed by electronics, then food. The keys to MSME development are local wisdom, digital transformation, and the intervening role of digital transformation/strengthening MSMEs. Driving factors for MSME success in implementing digital technology including: access to internet technology, cloud-based data, artificial intelligence (AI), then support from policy makers to ensure an adequate regulatory framework and business environment. Strengthening MSMEs is a comprehensive effort to improve the ability of MSMEs to face challenges and opportunities in the world business. There is a need for intensive business training for MSMEs as well as preparing business plans for special economic zones.

Using digital technology for strategy and market research, upgrading skills (increasing skills) and digitalization knowledge, encouraging MSMEs to access wider markets, facilitating access to financing and monitoring fintech lending, as well as supporting regulations to maintain market balance. The current condition of MSMEs tends to be fat, but not healthy. MSMEs are required to innovate, but they cannot do it alone because they need support from universities, non-governmental organizations (NGOs) and the government. Therefore, success in new marketing is an important strategy for companies. (Hsu & Cheng, 2012), the research results show that innovation has a positive effect on the business performance of small and medium-sized enterprises (SMEs) in Taiwan's electronics and information industry. According to the research results of (Méndez-Picazo et al., 2021), the launch of new products, new work activities and new market activities are related to business growth. (Li et al., 2021, research on Turkish manufacturing has shown that aspects of innovation (product, process,

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ISSN 2561-8156 (Online) - ISSN 2561-8148 (Print)

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doi: 10.5267/ijdns.2024.1.011

marketing and management) affect performance. The same is done in Pakistan's manufacturing industry by (Marion & Fixson, 2021), which shows that the nature of innovation can be affected. Likewise, follow-up studies have shown that innovation has a positive and significant effect on performance (Shang et al., 2020).

In the business world, the role of Information Technology is used for electronic commerce or known as E-Commerce (e-commerce) or electronic commerce. E-Commerce is trading using internet communication networks. E-commerce is part of e-business, where the scope of e-business is broader, not just commerce but also includes collaborating with business partners, customer service, job vacancies and so on. Apart from www network technology, e-commerce also requires database or database technology, e-mail or electronic mail (e-mail), and other forms of non-computer technology such as goods delivery systems, and payment tools for e-commerce. -trade this. Based on the explanations of the above research results, the purpose of this study is to analyze 1) the impact of innovation in small and medium enterprises on organizational performance, 2) the impact of information technology on operations, and 3) the analysis. The role of information technologies in mediating business innovation. Based on previous research findings, what is new in this study is the use of ICT as a mediating variable between innovation and business performance.

In Bali Indonesia, SMEs have a significant contribution to the expansion of job opportunities and employment, the formation of gross domestic product, and the provision of social safety nets for low-income communities to carry out productive economic activities. However, the contribution of SMEs is not sufficient to encourage economic growth and increase higher incomes. SMEs in Bali have difficulty in improving their business performance, where the Province of Bali ranks number 16 out of 33 provinces evaluated (National Development Planning Agency/BAPPENAS, 2015: 12). Business performance is defined as the company's ability to realize goals supported by good administrative skills, good governance and a reliable commitment to achieving business goals (Guluma, 2021). There will be a successful business activity if the business is built in accordance with the needs and desires of the target market demand. Besides, the products produced must have high specifications and effectiveness compared to competitors, so as to be able to build competitive advantage (Heng & Affiah, 2020). Technopreneurship can provide benefits or impacts, economically, socially and environmentally. The economic impact is: 1. Increase efficiency and productivity. 2. Increase income. 3. Create new jobs. To answer these challenges, the role of Technopreneurship is a must for SMEs to improve their business performance. This research contributes to improving the business performance of SMEs in Bali Indonesia. This study also provides an important contribution in enriching the conceptualization of SMEs developed by previous researchers, demonstrating the importance of the role of technopreneurship in developing the performance of SMEs business performance.

## 2. Hypotheses development

Based on the explanations of the above research results, the purpose of this study is to analyze 1) the impact of innovation in small and medium enterprises on organizational performance, 2) the impact of information technology on operations, and 3) the analysis. The role of information technologies in mediating business innovation. Based on previous research findings, what is new in this study is the use of ICT as a mediating variable between innovation and business performance.

### 2.1 Information Technology (IT)

Benbya et al. (2020) indicates that computing is a communication tool through computer software. IT is defined as a part of the machine that can carry out a series of instructions. The Office of Communications (1991) explains that the term IT is used to describe new technologies and their applications, including all aspects of computers used as micro devices, satellites and technology. From all these definitions, we can say that information technology is a part of information technology. Many studies have been done on the use of IT. (Akpan et al., 2022) states that computers and other technologies are widely used in all aspects of business, industry, finance, education and government. (Etemad, 2020) states that IT plays an important role in supporting business success in situations of uncertainty and economic crisis. Research on the use of ICT for entrepreneurship has been conducted around the world and it has been found that an individual's entrepreneurial ability is associated with personal innovation, the courage to take risks, the ability to understand ideas and take responsibility for success. combination (Afawubo & Noglo, 2022). Because IT systems affect products and services, markets, production costs, and product differentiation, the success of business innovation depends heavily on the deployment and innovative use of IT (Paiola& Gebauer, 2020). (Guluma, 2021) IT is about on social entrepreneurship. Specify it affects sustainable development. Efficiency and improvement are important to the industry because overcoming geographic boundaries requires employees to have computer skills. The indicators used to measure ICT are: 1) The use of information technology as a driver for industry (Pan et al., 2022; 2) Understand the importance of using information technology (Ofori et al., 2022); 3) and the skills to use information technologies (Kaplan, (2020).

### 2.2 Hypotheses Formulation

#### 2.2.1 Innovation and Industry Performance

Product innovation is one of the key factors of organizational success and an important strategy for increasing market share and business performance (Soomro et al., 2021). Innovation reduces production costs and is beneficial for customer satisfaction (Sellitto et al, 2020). Currently, the goals of new marketing are to increase sales, increase market share and pioneer new markets (Azzam et al., 2021). According to (Nasir et al., 2020), creativity and innovation play an important role in the growth of organizational performance in international markets. Many previous studies have shown that innovation has a positive effect on business functions (Setini et al., 2020). Studies Purwadi et al., (2023), show that creativity affects business performance. Innovation is often considered the lifeblood of an organization and is essential to business. Success in new marketing is an important strategy for companies because their ability to market creatively can help them dominate existing markets or develop new ones and share in their immediate industry leadership. Research by (Chen, 2020) shows that

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ISSN 2561-8156 (Online) - ISSN 2561-8148 (Print)

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doi: 10.5267/j.ijdns.2024.1.011



innovation has a positive effect on the business performance of small and medium-sized enterprises (SMEs) in Taiwan's information and electronics industry. According to the research results of (Bil, 2021), research in the Turkish manufacturing industry shows that aspects of innovation (product, process, marketing and management) influence performance. The same is done in Pakistan's manufacturing industry by, which shows that the nature of innovation can be affected. Similarly, follow-up studies have shown that innovation has a positive and significant effect on performance (Ma et al 2021). Based on the research results used as a reference for this study, the hypotheses presented in this study are as follows.

H1: Innovation has a positive effect on industry performance

### 2.2.2 Innovation and IT

For SMEs to achieve a higher level of innovation, all activities related to innovation made by companies, should have a basic support of information technology and communication (Heimonen, 2012), (Blanchard, 2020). (Yüksel, 2020) also concluded in their study that the companies that made a major investment in information technology and communication achieved a higher level of competition and innovation that companies that did not invest in it. According to (Charles & Ochieng, 2023) usually the ideas that become innovations are implemented by initiatives of the information and communication technology, commonly, the results of this improve significantly the innovation of new products and processes, which translates in a customer's loyalty promotion and stimulate a demand for other products of the organization. Meanwhile, (Alam & Mohanty, 2022) considered in their study that the extent to which firms want to maximize innovation activities performed daily, should in the first instance, adopt and implement the information and communication technology and, on appeal, align initiatives in information and communication technology with all activities of the innovation made by organizations. Also, these businesses have regularly taken the information technology and communication for use in the management of customer relationships, improve the production process, managing the supply chain, innovation and other essential activities of organizations (Normal et al. 2023); (Munizu et al., 2024). Based on the research results used as a reference for this study, the following hypothesis was established in this study.

H2: Innovation has a positive effect on Information Technology

### 2.2.3 IT and Industry Performance

The success of corporate innovation is highly dependent on IT implementation and innovation. Research by (Kim et al., 2021) shows that IT is an important resource for improving business performance. Based on research on the relationship between IT and corporate performance and value (Ashal et al., 2021), IT is a strategic resource and has a significant impact on performance. (Charles & Ochieng, (2023) Studies show that IT has a positive impact on future business performance and increases business value. (Ashal et al., 2021) Research findings also revealed that IT has a primary impact on strategic direction and corporate performance. Research by (Shabbir & Wisdom, 2020) also found that IT investments have significant potential to improve business performance. (Ahmed et al., 2020) Studies have also shown that IT investment strategies have a significant impact on business performance. The hypotheses that can be made by combining the above research findings are as follows.

H3: Information Technology has a positive effect on industry performance

### 2.2.4 The Role of IT in Mediating Innovation on Industry Performance

The role of IT not only has a direct effect on improving performance, but also has an indirect effect through its role as a mediator of the relationship between innovation and performance. According to the research of (Adigwe et al., 2023), one of the many things that characterize the current century is information and communication technologies, which play an important role in laying the foundations for the adoption and implementation of the innovations necessary for organizations to improve management and productivity. This is how you survive in a very global and competitive market. Research by (Aceto et al., 2018), shows that IT and innovation determine company performance. IT can increase productivity and business performance by enabling businesses to sustain and thrive in market changes (Alves and Alves, 2015). (Kinyua et al., 2015) states that the technology that controls the purchase of resources to control internal processes that improve financial performance to improve business performance. In addition, IT is said to play an important role in improving business performance by increasing the output of those assets (Farida & Setiawan, 2022). IT is also important in helping companies win the competition (Bressler, 2012). Based on the results of the investigation, the following hypothesis was proposed.

H4: Information Technology mediates the relationship between innovation and industry performance

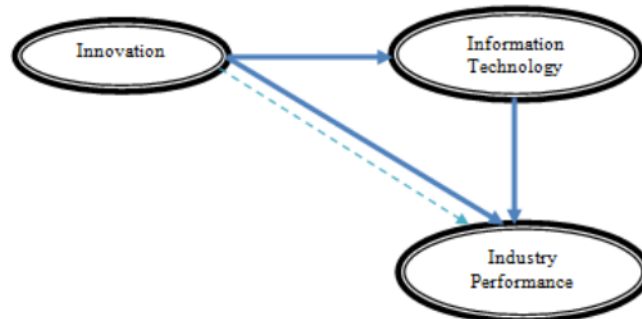


Fig. 1. Conceptual Framework

## 3. Research method

### 3.1 Research Setting and Sample

This research was conducted in the Province of Bali, Indonesia in 2024, with the total number of SMEs in the province of Bali is 15,198 (Bali Provincial Industry Office 2019), the number of samples studied is 347 SMEs, the method used to determine the sample size is (Rahman et al., 2022), the method in determining the number of respondents in each district is proportionate stratified random sampling, while the selection of respondents using simple random sampling method. Respondents in this study were SMEs business owners. Data was obtained by distributing pre-prepared questionnaires directly to 347 respondents throughout Bali. The research objects are: SMEs business performance, innovation consisting of three dimensions, namely: product innovation, process innovation, and marketing innovation and information technology.

### 3.2 Data analysis

In analyzing the effect of exogenous variables on endogenous variables use a structural equation model (SEM) based on Partial least square (PLS). The reason is that PLS is not based on many assumptions (Baak et al., 2020), the data does not have to be normally distributed for all categories: ordinal, interval and ratio. Analysis is not based on measurement scale, data distribution and sample size. PLS can be used for both theory confirmation and latent correlation of variables, in analysis for the innovation construct using the second order model because innovation is divided into three dimensions, namely product, process and marketing innovation. while the constructs of information technology and business performance use the first order model because there are no analyzed dimensions in the model. In this study the indicators that make up the latent variable are reflexive, then the evaluation of the measurement model (measurement model/outer model), to measure the validity and reliability of these indicators are: a) convergent validity, b) discriminate validity, and c) composite reliability and cronbach alpha. While the evaluation of the structural model (Structural Inner Model) to evaluate the level of accuracy of the model in the research as a whole is carried out through the analysis of: a) R-Square ( $R^2$ ), b) Q-Square Predictive Relevance ( $Q^2$ ), c) Goodness of Fit (GoF) , and d) Structural Model Analysis.

## 4. Findings

### 4.1 Respondent Profile

The profile of the respondents studied as shown in table 1 shows that of the 347 respondents studied, 49.50 percent were women and 50.50 percent were men. Judging from the age of the respondents, 8.70 percent are between 17-22 years old, 15.50 percent are 23-28 years old, 11.70 percent are 29-34 years old and 64.10 percent are over 34 years old. The respondents studied had a relatively high level of education, namely 56.30 percent with a college education background, 4.90 percent junior high school and 38.80 percent high school. Meanwhile, in terms of the products produced, 32 percent of them provide food and beverages, 43.70 percent of fashion, 7.8 percent of ceremony equipment, body care and furniture respectively 4.90 percent and 6.80 percent of souvenirs.

**Table 1 Gender, Age, Education and Products Produced by Respondents**

Gender	Percentage
Male	47,50
Female	52,50
Age (Year)	Percentage
17 - 22	7,70
23 - 28	16,50
29 - 34	12,70
> 34	63,10
Education	Percentage
Junior High school	5,90
Senior High school	39,80
College	54,30
Product	Percentage
Food and Beverage	33,00
Fashion	44,70
Ceremonial Equipment	5,80
Body care	6,90
Furniture	5,90
Souvenirs	5,80

Source: Field research results

### 4.2 Data Analysis

Based on the result of the calculation of field research data using a structural equation modeling model based on PLS, the analysis can be described as follows.

#### 4.2.1 Outer Model Evaluation

##### 1) Convergent Validity

Convergent validity is a criterion in measuring the validity of reflexive indicators. This evaluation is carried out by examining the outer loading coefficient of each indicator on its latent variables. An indicator is said to be valid, if the coefficient of outer loading is between 0.60 – 0.70 but for an analysis whose theory is not clear then an outer loading of 0.50 is recommended (Sawyer, 2009), and is significant at the alpha level of 0.05 or t- statistics 1.96. The value of

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ISSN 2561-8156 (Online) - ISSN 2561-8148 (Print)

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doi: 10.5267/j.ijdns.2024.1.011

the outer loading of each indicator on the latent variable can be seen in Table 1 shows that all indicators are valid.

**Table 1. Outer Loading Index Indicators**

Construct	Indicator	Original Sample	Description
Industry Performance	Y11	0.86	Valid
	Y12	0.92	Valid
	Y13	0.82	Valid
	Y14	0.87	Valid
Information Technology	X11	0.79	Valid
	X12	0.92	Valid
	X13	0.95	Valid
Process Innovation	X211	0.83	Valid
	X212	0.85	Valid
	X213	0.84	Valid
	X214	0.85	Valid
Distribution Innovation	X221	0.85	Valid
	X222	0.67	Valid
	X223	0.78	Valid
Product Innovation	X231	0.74	Valid
	X232	0.72	Valid
	X233	0.78	Valid
	X234	0.76	Valid

Source: research data calculation results 2023

## 2) Discriminate Validity

Measurement of the validity of the indicators that make up the latent variable can also be done through discriminate validity. Discriminate validity can be done by comparing the coefficient of the AVE Root ( $\sqrt{\text{AVE}}$  or Square root Average Variance Extracted) of each variable with the correlation value between variables in the model. A variable is said to be valid, if the AVE root is greater than the correlation value between variables in the research model, and the AVE is greater than 0.50.

**Table 2. AVE Value**

Construct	AVE	$\sqrt{\text{AVE}}$
<b>Industry Performance</b>	0.67	0.81
<b>Information Technology</b>	0.85	0.92
<b>Process Innovation</b>	0.77	0.85
<b>Distribution Innovation</b>	0.69	0.82
<b>Product Innovation</b>	0.67	0.82
<b>Innovation</b>	0.58	0.74

Source: research data calculation results 2023

Table 2 shows that all constructs show a value of AVE > 0.50, the AVE root value ranges from 0.74 - 0.92 while the correlation value between constructs ranges from 0.62 - 0.90, meaning that the discriminate validity test results show that all constructs are valid.

## 3) Composite Reliability and Cronbach Alpha

A measurement can be said to be reliable, if the composite reliability and Cronbach alpha have a value greater than 0.70. Composite reliability and Cronbach alpha are a measure of reliability between indicator blocks in the research model.

**Table 3. Cronbach Alpha and Composite Reliability Index**

Construct	Cronbachs Alpha	Composite Reliability
<b>Industry Performance</b>	0.83	0.85
<b>Information Technology</b>	0.95	0.96
<b>Process Innovation</b>	0.88	0.94
<b>Distribution Innovation</b>	0.78	0.87
<b>Product Innovation</b>	0.87	0.87
<b>Innovation</b>	0.93	0.95

Source: Survey data calculation results 2023

Table 3 shows that all constructs have Cronbach alpha and composite reliability values greater than 0.70, so they have met the valid requirements.

### 4.2.2 Inner Model Evaluation

Evaluation of the structural model (Inner Model) is a measurement to evaluate the level of accuracy of the model in the

research as a whole, which is formed through several variables and their indicators. The results of further calculations are described below.

### 1) Evaluation of Structural Models Through R-Square ( $R^2$ )

$R^2$  can show the strength and weakness of the influence caused by the dependent variable on the independent variable.  $R^2$  can also show the strength of a research model. According to Hair et al. (2014), the  $R^2$  value of 0.75 is classified as a strong model, while the  $R^2$  of 0.50 is classified as a moderate model and the  $R^2$  value of 0.25 is classified as a weak model.

**Table 4. R-Square Index**

Construct	R-Square
Industry Performance	0.53
Information Technology	0.63
Process Innovation	0.78
Distribution Innovation	0.81
Product Innovation	0.83

Source: Survey data calculation results 2023

Table 4 shows that the dimensions of process, distribution and product innovation show a strong  $R^2$  value with each value greater than 0.75. Meanwhile, performance and IT showed moderate values with values ranging from 0.50 to 0.62.

### 2) Structural Model Evaluation through Q-Square Predictive Relevance ( $Q^2$ )

$Q^2$  is a measure of how well the observations made give results to the research model. The criteria for the strength of the model measured based on the  $Q^2$  are as follows: 0.35 (strong model), 0.15 (moderate model), and 0.02 (weak model). The calculation results show the value of  $Q^2 = 1 - (1-0.62)(1-0.80)(1-0.76)(1-0.81)(1-0.52) = 0.99$ , included in the strong model criteria.

### 3) Structural Model Evaluation through Goodness of Fit (GoF)

Goodness of Fit (GoF) is a measurement of the accuracy of the overall model, because it is considered a single measurement of the measurement of the outer model and the measurement of the inner model. The criteria for the strength of the model based on the measurement of Goodness of Fit (GoF) according to (Tellinghuisen, 2022), are as follows: 0.36 (GoF large), 0.25 (GoF medium), and 0.10 (GoF small). The calculation results show the value of  $GoF = \sqrt{0.70 * 0.69} = 0.69$  or includes a strong model.

### 4) Structural Model Analysis

The aim is to determine the effect and significance of exogenous constructs on endogenous constructs. The results of this analysis at the same time answer the research questions posed.

**Table 5. Path Coefficient and Statistical Test**

Construct	Coefficient	P-Value	Description
IT -> Industry Performance	0.21	0.16	Not Significant
Innovation -> Business Performance	0.56	0.00	Significant
Innovation -> IT	0.78	0.00	Significant
Innovation -> Innovation Process	0.88	0.00	Significant
Innovation -> Innovation Marketing	0.88	0.00	Significant
Innovation -> Innovation Product	0.91	0.00	Significant

Source: Survey data calculation results 2023

The findings in this study (Table 5, Figure 1) show that innovation has a positive and significant effect on business performance ( $b = 0.55$  P-Value = 0.00), so that hypothesis 1 which states that innovation has a positive and significant effect on business performance is accepted. Innovation also has a positive and significant effect on IT ( $b = 0.79$  P-Value = 0.00), so that hypothesis 2 which states that innovation has a positive and significant effect on IT is accepted. IT has a positive but not significant effect on business performance ( $b = 0.20$  P-value = 0.14), meaning that hypothesis 3 which states that IT has a positive and significant effect on business performance cannot be accepted. The results of the study also show that process, marketing and product innovation are able to reflect the innovation construct, each with an index coefficient of 0.87; 0.89 and 0.90 and all of them were statistically significant (Table 5). Subsequent findings also show that IT is not a mediation between innovation and business performance, it is shown that the direct relationship coefficient

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ISSN 2561-8156 (Online) - ISSN 2561-8148 (Print)

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doi: 10.5267/j.ijdns.2024.1.011

between innovation and business performance is 0,71 and is significant, while the indirect relationship between innovation on IT and business performance is 0,16 and is not significant. Therefore, hypothesis 4 which states that IT is mediation between innovation and business performance cannot be accepted (Table 6).

**Table 6. Direct and Indirect Effect**

Constructs Relationships	Coefficient	P-Value	Description
<b>Direct Effect</b>			
<b>Innovation-&gt; Industry Performance</b>	0.72	0	Significant
<b>Indirect Effect</b>			
<b>Innovation-&gt; IT-&gt; Industry Performance</b>	0.17	0.16	Not Significant

## 5. Discussions

### 5.1 The Effect of Innovation on SMEs Industry Performance

The result of calculation on the field research data shows that innovation has a positive effect of 0.56 and is significant at the 0.05 level on business performance (Table 5). This means that increasing innovation in SMEs will improve the business performance of SMEs in Bali Province. The result of the analysis also shows that the three dimensions of innovation, namely product, process and distribution innovation are able to significantly shape the innovation construct. The result of this study is in accordance with the result of previous studies stating that product innovation is one of the key factors for organizational success and is an important strategy for increasing market share and business (Etemad , 2020). The process innovation, meanwhile, is useful for reducing production costs and also for satisfying customers (Afawubo & Noglo, 2022). Besides, the target of marketing innovation is to increase sales, market share and open new markets (Guluma, 2021). According to (Pan et al., 2022) creativity and innovation have an important role for the growth of organizational performance in the global market. A company's ability to trade innovation can help dominate current markets or develop new markets, contributing to continued industry leadership. Thus, success in commercializing innovation is an important strategy for companies (Munizu et al., 2024).

### 5.2 The Effect of Innovation on Information Technology

The result of analysis in Table 5 shows that innovation has a positive effect of 0,78 and is significant in 0,05 level of significant on IT, it mean that the increasing of innovation both product, process and marketing innovation will boost higher of using IT. The result of this study is in accordance with the underlying theory of this research, that there is a positive relationship between innovation and IT. The result of this study is in accordance with the result of previous studies stating that the information and communication technology also plays an important role in the new millennium companies, since its adoption and implementation in business activities generates, on one hand, a higher level of process innovation (Kaplan, (2020). SMEs to achieve a higher level of innovation, all activities related to innovation made by companies, should have a basic support of information technology and communication (Afawubo & Noglo, 2022), (Guluma, 2021). Study by (Ofori et al., 2022) stated that one of the many elements that characterize the present century is the information and communication technology, which plays a fundamental role in establishing the basis for the adoption and implementation of the innovation activities that the organizations need to improve management and production methods, which will allow them to survive in a highly globalized and competitive market.

### 5.3 The Effect of Information Technology on Industry Performance

The result of the analysis in Table 5 shows that IT has a positive effect on business performance, meaning that the increasing use of information technology will encourage higher business performance. This means that the result is in accordance with the underlying theory of this research, that there is a positive relationship between IT and performance. However, this relationship is not significant at the 0.05 level as shown in Table 5. The result of this calculation is in accordance with the reality on the ground that the use of IT among SMEs in Bali Province is still limited. SMEs in Bali Province in marketing their products dominantly still use traditional methods, namely door-to-door. The role of promotion using print and electronic media or the internet is still relatively small. The data shows that SMEs in Bali generally use the door to door marketing method, which is 70.40%. They generally use promotional media from person to person on a limited scale; this condition is a traditional business management model with limited production quantities. Of all respondents studied, only 22.40% have used modern information technology in the form of the internet in marketing their products. In addition, there are also as many as 7.10% of SMEs that use other methods besides the two methods, namely handing over to collectors or production is ordered only so that it does not require marketing media to sell its products.

The result of this study is different from the result of previous studies which states that IT has a significant effect on performance, including the result of research by (Sellitto et al, 2020) showing that IT is an important valuable resource in improving business performance. (Kinyua et al., 2015) research result on the relationship between IT and firm performance and value shows that IT as a strategic resource has a significant positive effect on performance. The study of Purwadi et al. (2023) shows that IT and innovation determine company performance. (Bil, 2021) study shows that IT shows a positive influence on future company performance and increases firm value. The great potential of IT investment in improving business performance has also been carried out through a study by (Bressler, 2012). (Farida & Setiawan, 2022) study also shows that IT investment strategies have a real influence on company performance.

### 5.4 The Role of Information Technology in Mediating the Relationship Between Innovation and Industry Performance

To find out the role of IT in mediating the relationship between innovation and business performance. The examination method is done by doing two analysis, namely analysis involving mediating variables (indirect effect) and analysis without involving mediating variables (direct effect). The method of examining the mediating variable with the coefficient difference approach is carried out as follows: if the indirect relationship is significant while the direct relationship is not significant, it is said that IT is a perfect mediation of the relationship between innovation and business performance. If the direct relationship is significant while the indirect relationship is not significant, it is said that IT is not a mediating relationship between

Based on the coefficient relationship between constructs, it can be seen that the direct relationship coefficient between innovation and business performance is 0,72 and is significant, while the indirect relationship between innovation on IT and business performance is 0,17 and is not significant. From the result of the analysis, it can be stated that IT is not mediation between innovation and Performance Industry. This is in accordance with the result of the previous analysis between IT and Performance Industry that has an insignificant relationship, this condition is strongly influenced by the use of IT in SMEs in Bali which is generally still relatively limited, the dominant marketing activity is at the local district level with the most method using door to door without IT assistance. Meanwhile, SMEs that market their products for export are still relatively limited. The role of promotion using print and electronic media or the internet is still relatively small. The data in Figure 1 shows that SMEs in Bali generally use the door to door marketing method, which is 70.40%. They generally use promotional media from person to person on a limited scale; this condition is a traditional business management model with limited production quantities.

The result of this study is different from the result of previous studies which state that IT plays an important role as a mediator between innovation and Performance Industry, including a study by (Normal et al. 2023) which states that success in corporate innovation is highly depend on the implementation and creativity of using IT. The result of studies also states that IT enables companies to maintain sustainability and gain success in various market changes so that it can increase profits and Performance Industry (Shabbir & Wisdom, 2020). The result of this study is also different from the result of the study by (Charles & Ochieng, 2023) which states that technology facilitates the acquisition of resources that facilitate internal processes in improving financial performance to improve performance industry. The result of this study differs from the study of (Ashal et al., 2021) which states that IT plays an important role in increasing the output of the same resources to improve business performance. Besides that, it is different from the study result which states that IT is also the most recognized factor to support companies in winning the competition (Ahmed et al., 2020). Thus the hypothesis which states that IT mediates innovation on organizational performance industry cannot be accepted.

## 6. Conclusion

The results of this study indicate that innovation has a positive and significant effect on industry performance, the increasing innovation will improve industry performance. In addition, innovation also has a positive and significant effect on IT, meaning that the higher the innovation will also encourage the higher use of IT. The next finding also shows that IT has a positive but not significant effect on industry performance. In addition, IT also does not mediate the relationship between innovation and industry performance. This is due to the low use of IT among SMEs entrepreneurs in Bali in supporting their business activities, in product marketing still dominant using traditional methods such as door to door. Another contributing factor is that the scope of marketing is generally still limited on a local scale, only a small number of which have exported, so the use of IT is also limited.

## 7. Implication

The findings of this study are expected to provide benefits for the development of entrepreneurship in Bali-Indonesia as an effort to improve industry performance. This condition is a fact that SMEs in Bali-Indonesia cannot be separated from the role of employee production skills because SMEs products in Bali are dominantly based on local wisdom that comes from skills born of Balinese human artistic talent. However, as an effort to improve product marketing, the role of information technology is also very important to be improved.

Technopreneurship which is the integration of innovation with information technology is an important factor in supporting the industry performance of SMEs in Bali-Indonesia. However, nowadays the use of IT is still limited so it is very important to be improved in the future. The result of this study is expected to be a guide line for SMEs and policy makers in their effort to improve industry performance, which is currently still relatively low.

### 7.1 Theoretical Implications

The results of this study are expected to contribute to the development of science, especially the importance of the role of Technopreneurship for improving the performance of SMEs, especially in Bali Indonesia. SMEs are generally based on the use of local wisdom in supporting their industry performance, but to increase business growth, the role of Technopreneurship is very decisive in winning business competition.

### 7.2 Practical Implications

It is hoped that the result of this study can give contribution to SMEs in Bali, especially in giving better attention to the use of information technology to improve industry performance, especially in increasing the quantity of marketing to a wider market, namely exports both domestically and abroad. It is also expected that the result of this study can give input for the Balinese government to make policies in an effort to improve the industry performance of SMEs in Bali, especially in facilitating the need for IT facilities which are currently still relatively low in use.

## 8. Limitation of the Research

This study is limited to the analysis of the relationship between innovation and information technology as a predictor of industry performance. Therefore, it is hoped that for future research it is necessary to add other variables that affect industry performance such as production technology, investment, type of education, leadership, work environment and organizational culture. This research was only conducted on SMEs in Bali and private companies so it cannot be used for generalization in an effort to improve industry performance as a whole. Further research can be carried out on companies in non-manufacturing industries or other industrial sizes.

3

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ISSN 2561-8156 (Online) - ISSN 2561-8148 (Print)

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doi: 10.5267/j.ijdns.2024.1.011

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ISSN 2561-8156 (Online) - ISSN 2561-8148 (Print)

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doi: 10.5267/j.ijdns.2024.1.011





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In the arrangement of sentences, there are still some writings that are copied and pasted and become long and unclear sentences

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Thank you for your good information, give me time to think because this cost is quite expensive.

Thank you once again  
Best Regard  
Yasa

Pada Min, 7 Apr 2024 pukul 06.19 Editor Growing Science  
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Dear Yasa

This paper could be considered for publication in our other journal named Uncertain Supply Chain Management. The editing fee is \$ 1650. If you wish to proceed please let me know

Best  
Sadjadi

On Fri, Apr 5, 2024 at 10:57 AM putu suyatna <[putusuyatna2963@gmail.com](mailto:putusuyatna2963@gmail.com)> wrote:  
Dear Chief Editor  
Good morning, I hope you are in good health.  
I have revised my submitted article yesterday. Below I have attached the fix

Look forward hearing from you  
Thank you once again

Best Regard  
Yasa

Pada Jum, 5 Apr 2024 pukul 06.04 putu suyatna <[putusuyatna2963@gmail.com](mailto:putusuyatna2963@gmail.com)>  
menulis:  
Dear Chief Editor

Thank you so much for the great news.  
I will make repairs as soon as possible and return it to you

Best Regard  
Yasa

Pada Jum, 5 Apr 2024 pukul 06.02 Editor Growing Science  
<[egrowingscience@gmail.com](mailto:egrowingscience@gmail.com)> menulis:

Dear Mr Yasa (and co-authors, if any),

We and the Team have reviewed your article in submission ID: 3323 with the research title 'Contribution on Creative Industry Performance', we are happy to say that we consider it a good candidate for publication, after a number of revisions have been made.

Please make revisions to some of the reviewer's suggestions

Please read the results of each reviewer's review

Please be assured that few submissions are accepted without requiring revision.

We hope to receive your reshipment within the next 10 days maximum.

Greetings,

Prof. Dr. Sadjadi

International Journal of Data and Network Science

Reviewer 1

"Management Transkip"

Originality of the work: Acceptable

Subject relevance: Acceptable

Professional/industrial relevance: Acceptable

Completeness of the work: Acceptable

Acknowledgement of the work of others by references: Acceptable

Organisation of the manuscript: Acceptable

Clarity in writing tables graphs and illustrations: Acceptable

Likelihood of passing the 'test of time': Acceptable

"Content Quality"

The title used is interesting and appropriate to the current era

The abstract meets the rules of having objectives, methods and findings

has been stated in relation to the problems and objectives of this research

Literature is sufficient

The method and results are very good

Recommendation: Accepted

Reviewer 2

In the arrangement of sentences, there are still some writings that are copied and pasted and become long and unclear sentences

The method is more refined

the results are quite clear

Add literature related to this journal

Recommendation: Accepted with minor revisions

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Add literature related to this journal

Recommendation: Accepted with minor revisions

## Technopreneurship Contribution on creative Industry Performance

I Putu Ngurah Suyatna Yasa<sup>a\*</sup>

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### CHRONICLE

#### Article history:

Received: Maret 1, 2024

Received in revised format: Mei 25, 2024

Accepted: June 16, 2024

Available online: July 16, 2024

#### Keywords:

Technopreneurship

Innovation

Information Technology

Business Performance

### ABSTRACT

Technology is becoming a trend, so this research examines Technopreneur as a driver of productivity for small or medium industries (SMEs). This research examines the impact of innovation on the performance of small and medium enterprises, the impact of information technology on industrial performance, and the role of information technology as a mediator of innovation on company performance. Data was collected through an online survey. The total population is 346, so that many questionnaires were distributed to MSMEs using path analysis and Smart PLS as processing tools. The findings are that innovation has an influence on increasing the productivity of small businesses, innovation has a positive role on information systems, remains insignificant on the performance of the business industry, and information technology does not mediate the relationship between innovation and performance. So it can be said that innovation plays an important role in improving company performance.

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## 1. Introduction

Indonesia's digital economy is the highest in ASEAN, growing at 12% annually. The implementation of digital technology in SMEs is 30.9% in the National Medium-term Development Plan 2020-2024 (RPJMN). "The benefits of digitization for SMEs include sales growth, efficient operation, cost reduction and market expansion. There are excellent products in many areas, but many digital processes have not been touched. SMEs have a strategic role, but challenges such as financing, digital. readiness and marketing . From 2020, the total annual consumption of the digital market will be dominated by beauty products, followed by electronics and then food. The keys to MSME development are local wisdom, digital transformation and the role of facilitator of digital transformation / MSME empowerment. The following factors contribute to the success of SMEs in adopting digital technologies: access to Internet technology, cloud-based data, artificial intelligence, and then the support of policy makers to ensure an adequate regulatory framework and business environment. Strengthening SMEs is a comprehensive effort to improve the ability of SMEs to meet the challenges and opportunities in global business. It is necessary to conduct intensive business training for SMEs and prepare business plans for special economic zones.

The spread of MSMEs is increasingly expanding and to be able to access a wide market, many things need to be addressed in various fields, such as technology or what is known as technology, regulations and market balance. Currently the market looks lively but is actually not healthy because there is overlap and this requires improvements from various parties. This small industrial sector is required to innovate, but of course it cannot do it alone because it requires support from universities, non-governmental organizations and the government. Therefore, success in new marketing is an important strategy for companies. (Hsu & Cheng, 2012), research results show that innovation has a positive effect on the business performance of small and medium enterprises (SMEs) in Taiwan's electronics and information industry. According to research results (Méndez-Picazo et al., 2021), new product launches, new work activities, and new market activities are related to business growth. (Li et al., 2021), research on Turkish manufacturing shows that aspects of innovation (product, process, marketing and management) influence performance. The same thing was also done in the Pakistani manufacturing industry by (Marion & Fixson, 2021) which shows that the nature of innovation can be affected. Likewise, Shang et al. (2020), also said that innovation is certainly a boost to the revival of business performance

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ISSN 2561-8156 (Online) - ISSN 2561-8148 (Print)

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doi: 10.5267/j.ijdns.2024.1.011



In the business world, the role of information technology is used in electronic commerce, or known as E-Commerce (e-commerce) or electronic commerce. The online store does business using online communication networks. Online shopping is a part of e-commerce, where the scope of e-commerce is more extensive, not only business, but also cooperation with business partners, customer service, open jobs, etc. In addition to www network technology, online shopping also requires the use of a database or database technology, electronic mail or e-mail (e-mail) and other forms of non-computer technology, such as delivery systems and e-commerce payments. Instruments - change it. Based on the explanations of the above research results, the purpose of this work is to analyze; 1) the impact of innovations in small and medium-sized enterprises on organizational performance; 2) the impact of information technology on operations; and 3) analysis. Based on previous research findings, the use of ICT as a mediator between innovation and business performance is new in this study.

The economy on Bali Island certainly cannot be separated from the role of MSMEs, because they play an important role in expanding employment opportunities and employment, generating GDP, and providing a social safety net for the poor to participate in productive economic activities. However, the contribution of SMEs is not enough to encourage economic growth and increase income. Business performance is defined as the company's ability to achieve goals supported by good management skills, good governance and reliable commitment to achieving business goals (Guluma, 2021). A successful business is born when the company is structured according to the needs and desires of the target market. In addition, the products produced must have high specifications and performance compared to competitors to create a competitive advantage (Heng and Afifah, 2020). Technopreneurship can have economic, social and environmental benefits or impacts. The benefits provided from an economic perspective are as follows: 1. Increase efficiency and productivity. 2. Increase income. 3. Create new jobs. To answer these challenges, the role of technopreneurship must be played by SMEs to improve their business performance. This research tries to determine whether innovation will help improve SME business performance in Bali. This research also makes a significant contribution in enriching the SME concept developed by previous researchers and shows the importance of technopreneurship in the development of SME business activities.

## **2. Relationship between variables and hypotheses**

Technology shows that computing is a communication tool for computer software Benbya et al. (2020). IT is defined as a part of a machine that can perform multiple commands. The Office of Communications (1991) explains that the term IT is used to describe new technologies and their applications, including all aspects of micro-devices, satellites and computers used as technology. Based on all these definitions, we can say that information technology is a part of information technology. The use of information technology has been widely studied. (Akpan et al., 2022) states that computers and other technologies are widely used in all areas of business, industry, finance, education and administration. (Etemad, 2020), claims that IT plays an important role in supporting business success in situations of uncertainty and economic crisis. The use of ICT for business has been studied around the world and it has been found that the entrepreneurship of an individual is related to personal innovation, risk, the ability to understand ideas and take responsibility for success combination (Afawubo and Noglo, 2022). Since IT systems affect products and services, markets, product costs and product differentiation, the success of a company's innovation largely depends on the adoption and innovative use of IT (Paioland Gebauer, 2020). (Guluma, 2021) IT is related to social entrepreneurship. Find out how this affects sustainability. Efficiency and improvement are important to the industry because crossing geographic boundaries requires workers to be computer literate. The indicators used to measure ICT are: 1) Use of information technology as an industrial driver (Pan et al., 2022; 2) Understanding the importance of using information technology (Ofori et al., 2022); 3) and IT usage skills (Kaplan, (2020).

### **2.1 Innovation and Industry Performance**

Product innovations are one of the key factors of organizational success and an important strategy to increase market share and company performance (Soomro et al., 2021). Innovation lowers production costs and is beneficial in terms of customer satisfaction (Sellitto et al., 2020). Currently, the goals of new marketing are to increase sales, increase market share and initiate new markets (Azzam et al., 2021). According to (Nasir et al., 2020), creativity and innovation play an important role in the growth of organizational performance in the international market. Many previous studies have shown that innovations have a positive impact on business activities (Setini et al., 2020). A study by Purwad et al (2023) shows that creativity affects company performance. Innovation is often considered the lifeblood of an organization and is essential to business. Success in new marketing is an important strategy for companies because their ability to market creatively can help them dominate existing markets or develop new ones and share immediate leadership in the field. (Chen, 2020) research shows that innovation has a positive impact on the business performance of small and medium-sized enterprises (SMEs) in Taiwan's information and electronic industry. According to the research findings of (Bil, 2021), a study of the Turkish manufacturing industry shows that aspects of innovation (product, process, marketing and management) affect performance. The same is done in the manufacturing industry of Pakistan, which shows that it is possible to influence the nature of innovation. Subsequent studies have also shown that innovation has a positive and significant effect on performance (Ma et al 2021). Based on the research findings used as a benchmark in this study, the hypotheses presented in this study are as follows.

H1: Innovation has a positive effect on industrial performance.

### **2.2 Information Technology and Innovation**

To achieve a higher innovation level of SMEs, all activities related to the innovative activities of companies must have the basic support of information technology and communication (Heimonen, 2012), (Blanchard, 2020). (Yüksel, 2020) also stated in his research that companies that invested heavily in information technology and communication achieved a higher level of competition and innovation than companies that did not invest in it. According to (Charles and Ochieng, 2023), ideas that become innovations are usually implemented with information and communication technology initiatives, the results of which usually significantly improve the innovativeness of new products and processes, which is expressed in customer loyalty. promote demand for other products of the organization. At the same time, (Alam and Mohanty, 2022) found in their study that as much as companies want to maximize the innovative activities carried out every day, the introduction and implementation of information and communication technology should be prioritized and, in the context of the appeal, harmonize initiatives in

communication and communication technology for all innovative activities of organizations. These companies also regularly adopted information technology and communication in customer relationship management, production improvement, supply chain management, innovation and other important activities of the organization (Normal et al. 2023); (Munizu et al., 2024). Based on the research results used as reference in this study, the following hypothesis was formulated in this study.

H2: Innovation has a positive effect on information technology.

### 2.3 Information Technology and Industry Performance

The success of corporate innovation is highly dependent on IT implementation and innovation. Research by (Kim et al., 2021) shows that IT is an important resource for improving business performance. Based on research on the relationship between IT and corporate performance and value (Ashal et al., 2021), IT is a strategic resource and has a significant impact on performance. (Charles & Ochieng, (2023) Studies show that IT has a positive impact on future business performance and increases business value. (Ashal et al., 2021) Research findings also revealed that IT has a primary impact on strategic direction and corporate performance. Research by (Shabbir & Wisdom, 2020) also found that IT investments have significant potential to improve business performance. (Ahmed et al., 2020) Studies have also shown that IT investment strategies have a significant impact on business performance. The hypotheses that can be made by combining the above research findings are as follows.

H3: Information Technology has a positive effect on industry performance

### 2.4 The Mediating Role of Technology on Information Technology and Industrial Performance

The role of information technology does not directly affect performance improvement, but also indirectly mediates the relationship between innovation and performance. According to a study (Adigwe et al., 2023), one of the many characteristics of the past century is information and communication technologies, which play an important role as a basis for the introduction and adoption of innovations needed by organizations. improve management and productivity. This is how you can survive well in a global and competitive market. Research (Aceto et al., 2018) shows that IT and innovation determine the performance of the company. IT can increase productivity and business efficiency, enabling companies to resist and succeed in market changes (Alves and Alves, 2015). (Kinyua et al., 2015) argue that technology that drives resource acquisition drives internal processes that improve financial efficiency to improve business performance. In addition, IT is said to play an important role in improving business operations by increasing the performance of those assets (Farida and Setiawan, 2022). It is also important to help companies beat the competition (Bressler, 2012). Based on the results of the study, the following hypothesis was presented.

H4: Information technology mediates the relationship between innovation and industrial performance.

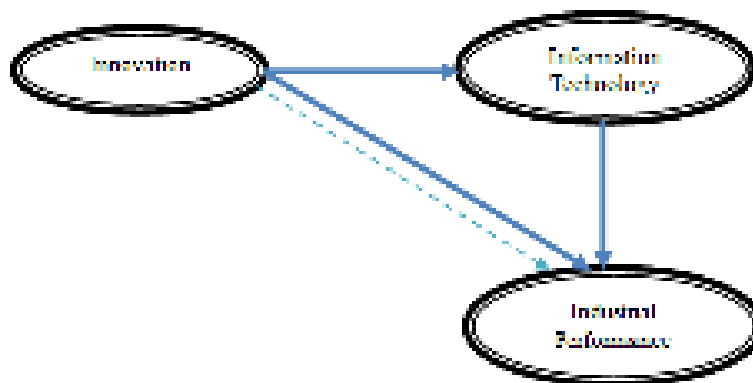


Fig. 1. Conceptual Framework

## 3. Research method

### 3.1 Research Setting and Sample

This research was conducted in 2022-2023 Bali-Indonesia on 15,198 MSMEs (Bali Provincial Industry Office 2019), the number of samples studied was 442,848 MSMEs, the research method used the sample size technique (Rahman et al., 2022), where samples were taken from each district using proportional stratified random sampling, while the selection of respondents used a simple random sampling method. The respondents used as samples were SME business owners who had been in business for one year. Data was obtained by distributing prepared questionnaires directly to 346 respondents throughout Bali. The research object is: SME business performance, innovation which consists of three dimensions, namely: product innovation, process innovation, and marketing and information technology innovation.

### 3.2 Data analysis

This research tests the influence of exogenous and endogenous variables with the SEM-PLS equation. The use of this analysis is due to assumptions (Baak et al., 2020), the data does not have to be normally distributed for all categories: ordinal, interval and proportion. The analysis does not depend on measurement scales, data distribution, and sample size. PLS can be used to validate theory and latent variable correlation, analyzing the innovation construct using a quadratic model, because innovation is divided into three dimensions, namely product, process and marketing innovation. The indicators that form latent variables are reflexive, so the evaluation of the measurement model (measurement model/external model) to measure the validity and reliability of these indicators is: convergent validity; discriminant validity; combined reliability, and Cronbach's alpha. Evaluation of the structural model (Structural Inner Model) to assess the level of accuracy of the model in the research as a whole is carried out by analyzing: (a) R-square (R2), (b) Q-Square Predictive. Relevance (Q2), (c) Fit (GoF) and (d) Structural

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ISSN 2561-8156 (Online) - ISSN 2561-8148 (Print)

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doi: 10.5267/ijidns.2024.1.011

Model Analysis.

#### 4. Findings

##### 4.1 Respondent Profile

The profile of the respondents studied as shown in table 1 shows that of the 346 respondents studied, 47.50 percent were women and 52.50 percent were men. Judging from the age of the respondents, 7.70 percent are between 17-22 years old, 16.50 percent are 23-28 years old, 12.70 percent are 29-34 years old and 63.10 percent are over 34 years old. The respondents studied had a relatively high level of education, namely 56.30 percent with a college education background, 5.90 percent junior high school and 39.80 percent high school. Meanwhile, in terms of the products produced, 32 percent of them provide food and beverages, 54.30 percent of fashion, 7.8 percent of ceremony equipment, body care and furniture respectively 4.90 percent and 6.80 percent of souvenirs.

**Table 1 Gender, Age, Education and Products Produced by Respondents**

Gender	Percentage
Male	47.50
Female	52.50
Age (Year)	Percentage
17 - 22	7.70
23 - 28	16.50
29 -34	12.70
> 34	63.10
Education	Percentage
Junior High school	5.90
Senior High school	39.80
College	54.30
Product	Percentage
Food and Beverage	33.00
Fashion	44.70
Ceremonial Equipment	5.80
Body care	6.90
Furniture	5.90
Souvenirs	5.80

Source: Field research results

##### 4.2 Data Analysis

Based on the result of the calculation of field research data using a structural equation modeling model based on PLS, the analysis can be described as follows.

##### 4.2.1 Outer Model Evaluation

###### 1) Convergent Validity

Convergent validity is a criterion in measuring the validity of reflexive indicators. This evaluation is carried out by examining the outer loading coefficient of each indicator on its latent variables. An indicator is said to be valid, if the coefficient of outer loading is between 0.60 – 0.70 but for an analysis whose theory is not clear then an outer loading of 0.50 is recommended (Sawyer, 2009), and is significant at the alpha level of 0.05 or t- statistics 1.96. The value of the outer loading of each indicator on the latent variable can be seen in Table 1 shows that all indicators are valid.

**Table 1. Outer Loading Index Indicators**

Construct	Indicator	Original Sample	Description
Industrial Performance	Y11	0.86	Valid
	Y12	0.92	Valid
	Y13	0.82	Valid
	Y14	0.87	Valid
Information Technology	X11	0.79	Valid
	X12	0.92	Valid
	X13	0.95	Valid
	X211	0.83	Valid
Process Innovation	X212	0.85	Valid
	X213	0.84	Valid
	X214	0.85	Valid
	X221	0.85	Valid
Distribution Innovation	X222	0.67	Valid
	X223	0.78	Valid
	X231	0.74	Valid
Product Innovation	X232	0.72	Valid
	X233	0.78	Valid
	X234	0.76	Valid

Source: research data calculation results 2023

###### 2) Discriminate Validity

Measurement of the validity of the indicators that make up the latent variable can also be done through discriminate validity. Discriminate validity can be done by comparing the coefficient of the AVE Root ( $\sqrt{\text{AVE}}$  or Square root Average Variance Extracted) of each variable with the correlation value between variables in the model. A variable is said to be valid, if the AVE root is greater than the correlation value between variables in the research model, and the AVE is greater than 0.50.

**Table 2. AVE Value**

Construct	AVE	$\sqrt{\text{AVE}}$
<b>Industrial Performance</b>	0.67	0.81
<b>Information Technology</b>	0.85	0.92
<b>Process Innovation</b>	0.77	0.85
<b>Distribution Innovation</b>	0.69	0.82
<b>Product Innovation</b>	0.67	0.82
<b>Innovation</b>	0.58	0.74

Source: research data calculation results 2023

Table 2 shows that all constructs show a value of AVE > 0.50, the AVE root value ranges from 0.74 - 0.92 while the correlation value between constructs ranges from 0.62 - 0.90, meaning that the discriminate validity test results show that all constructs are valid.

### 3) Composite Reliability and Cronbach Alpha

A measurement can be said to be reliable, if the composite reliability and Cronbach alpha have a value greater than 0.70. Composite reliability and Cronbach alpha are a measure of reliability between indicator blocks in the research model.

**Table 3. Cronbach Alpha and Composite Reliability Index**

Construct	Cronbachs Alpha	Composite Reliability
<b>Industrial Performance</b>	0.83	0.85
<b>Information Technology</b>	0.95	0.96
<b>Process Innovation</b>	0.88	0.94
<b>Distribution Innovation</b>	0.78	0.87
<b>Product Innovation</b>	0.87	0.87
<b>Innovation</b>	0.93	0.95

Source: Survey data calculation results 2023

Table 3 shows that all constructs have Cronbach alpha and composite reliability values greater than 0.70, so they have met the valid requirements.

#### 4.2.2 Inner Model Evaluation

Evaluation of the structural model (Inner Model) is a measurement to evaluate the level of accuracy of the model in the research as a whole, which is formed through several variables and their indicators. The results of further calculations are described below.

##### 1) Evaluation of Structural Models Through R-Square ( $R^2$ )

$R^2$  can show the strength and weakness of the influence caused by the dependent variable on the independent variable.  $R^2$  can also show the strength of a research model. According to Hair et al. (2014), the  $R^2$  value of 0.75 is classified as a strong model, while the  $R^2$  of 0.50 is classified as a moderate model and the  $R^2$  value of 0.25 is classified as a weak model.

**Tabel 4. R-Square Index**

Construct	R-Square
<b>Industrial Performance</b>	0.53
<b>Information Technology</b>	0.63
<b>Process Innovation</b>	0.78
<b>Distribution Innovation</b>	0.81
<b>Product Innovation</b>	0.83

Source: Survey data calculation results 2023

Table 4 shows that the dimensions of process, distribution and product innovation show a strong  $R^2$  value with each value greater than 0.75. Meanwhile, performance and IT showed moderate values with values ranging from 0.50 to 0,62.

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ISSN 2561-8156 (Online) - ISSN 2561-8148 (Print)

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doi: 10.5267/i.ijidns.2024.1.011

## 2) Structural Model Evaluation through Q-Square Predictive Relevance (Q<sup>2</sup>)

Q<sup>2</sup> is a measure of how well the observations made give results to the research model. The criteria for the strength of the model measured based on the Q<sup>2</sup> are as follows: 0.35 (strong model), 0.15 (moderate model), and 0.02 (weak model). The calculation results show the value of  $Q^2 = 1 - (1-0.62)(1-0.80)(1-0.76)(1-0.81)(1-0.52) = 0.99$ , included in the strong model criteria.

## 3) Structural Model Evaluation through Goodness of Fit (GoF)

Goodness of Fit (GoF) is a measurement of the accuracy of the overall model, because it is considered a single measurement of the measurement of the outer model and the measurement of the inner model. The criteria for the strength of the model based on the measurement of Goodness of Fit (GoF) according to (Tellinghuisen, 2022), are as follows: 0.36 (GoF large), 0.25 (GoF medium), and 0.10 (GoF small). The calculation results show the value of  $GoF = \sqrt{0.70 * 0.69} = 0.69$  or includes a strong model.

## 4) Structural Model Analysis

The aim is to determine the effect and significance of exogenous constructs on endogenous constructs. The results of this analysis at the same time answer the research questions posed.

**Table 5. Path Coefficient and Statistical Test**

Construct	Coefficient	P-Value	Description
<b>IT -&gt; Industrial Performance</b>	0.21	0.16	Not Significant
<b>Innovation -&gt; Business Performance</b>	0.56	0.00	Significant
<b>Innovation -&gt; IT</b>	0.78	0.00	Significant
<b>Innovation -&gt; Innovation Process</b>	0.88	0.00	Significant
<b>Innovation -&gt; Innovation Marketing</b>	0.88	0.00	Significant
<b>Innovation -&gt; Innovation Product</b>	0.91	0.00	Significant

Source: Survey data calculation results 2023

The results of this study (Table 5, Figure 1) show that innovation has a positive and significant effect on business performance ( $b = 0.55$  P-Value = 0.00), so hypothesis 1 that innovation has a positive and significant impact on business activity is accepted. Innovation also has a positive and significant effect on IT ( $b = 0.79$  P-value = 0.00), thus hypothesis 2 is accepted that innovation has a positive and significant effect on IT. IT has a positive but not significant impact on business performance ( $b = 0.20$  P-value = 0.14), which means that hypothesis 3 that IT has a positive and significant impact on business performance cannot be accepted. Also, the results of the study show that process, marketing and product innovations can reflect the innovation structure, each of which has an index coefficient of 0.87; 0.89 and 0.90 and all of them were statistically significant (Table 5). Further findings also show that IT is not a mediator between innovation and business performance, the direct relationship between innovation and business performance is shown to be 0.71 and significant, while the indirect relationship between IT innovation and business performance is 0.16 and it is notable. Therefore, hypothesis 4, according to which IT mediates innovation and business performance, cannot be accepted (Table 6).

**Table 6. Direct and Indirect Effect**

Constructs Relationships	Coefficient	P-Value	Description
<b>Direct Effect</b>			
<b>Innovation-&gt; Industrial Performance</b>	0.72	0	Significant
<b>Indirect Effect</b>			
<b>Innovation-&gt; IT-&gt; Industrial Performance</b>	0.17	0.16	Not Significant

## 2. Discussions

### 5.1 The Effect of Innovation on SMEs Industrial Performance

The result of calculation on the field research data shows that innovation has a positive effect of 0.56 and is significant at the 0.05 level on business performance (Table 5). This means that increasing innovation in SMEs will improve the business performance of SMEs in Bali Province. The result of the analysis also shows that the three dimensions of innovation, namely product, process and distribution innovation are able to significantly shape the innovation construct. The result of this study is in accordance with the result of previous studies stating that product innovation is one of the key factors for organizational success and is an important strategy for increasing market share and business (Etamad , 2020). The process innovation, meanwhile, is useful for reducing production costs and also for satisfying customers (Afawubo & Noglo, 2022). Besides, the target of marketing innovation is to increase sales, market share and open new markets (Guluma, 2021). According to (Pan et al., 2022) creativity and innovation have an important role for the growth of organizational performance in the global market. A company's ability to trade innovation can help dominate current markets or develop new markets, contributing to continued

industry leadership. Thus, success in commercializing innovation is an important strategy for companies (Munizu et al., 2024).

## **5.2 The Effect of Innovation on Information Technology**

The result of analysis in Table 5 shows that innovation has a positive effect of 0,78 and is significant in 0,05 level of significant on IT, it mean that the increasing of innovation both product, process and marketing innovation will boost higher of using IT. The result of this study is in accordance with the underlying theory of this research, that there is a positive relationship between innovation and IT. The result of this study is in accordance with the result of previous studies stating that the information and communication technology also plays an important role in the new millennium companies, since its adoption and implementation in business activities generates, on one hand, a higher level of process innovation (Kaplan, (2020). SMEs to achieve a higher level of innovation, all activities related to innovation made by companies, should have a basic support of information technology and communication (Afawubo & Noglo, 2022), (Guluma, 2021). Study by (Ofori et al., 2022) stated that one of the many elements that characterize the present century is the information and communication technology, which plays a fundamental role in establishing the basis for the adoption and implementation of the innovation activities that the organizations need to improve management and production methods, which will allow them to survive in a highly globalized and competitive market.

## **5.3 The Effect of Information Technology on Industry Performance**

The result of the analysis in Table 5 shows that IT has a positive effect on business performance, meaning that the increasing use of information technology will encourage higher business performance. This means that the result is in accordance with the underlying theory of this research, that there is a positive relationship between IT and performance. However, this relationship is not significant at the 0.05 level as shown in Table 5. The result of this calculation is in accordance with the reality on the ground that the use of IT among SMEs in Bali Province is still limited. SMEs in Bali Province in marketing their products dominantly still use traditional methods, namely door-to-door. The role of promotion using print and electronic media or the internet is still relatively small. The data shows that SMEs in Bali generally use the door to door marketing method, which is 70.40%. They generally use promotional media from person to person on a limited scale; this condition is a traditional business management model with limited production quantities. Of all respondents studied, only 22.40% have used modern information technology in the form of the internet in marketing their products. In addition, there are also as many as 7.10% of SMEs that use other methods besides the two methods, namely handing over to collectors or production is ordered only so that it does not require marketing media to sell its products.

The result of this study is different from the result of previous studies which states that IT has a significant effect on performance, including the result of research by (Sellitto et al, 2020) showing that IT is an important valuable resource in improving business performance. (Kinyua et al., 2015) research result on the relationship between IT and firm performance and value shows that IT as a strategic resource has a significant positive effect on performance. The study of Purwadi et al. (2023) shows that IT and innovation determine company performance. (Bil, 2021) study shows that IT shows a positive influence on future company performance and increases firm value. The great potential of IT investment in improving business performance has also been carried out through a study by (Bressler, 2012). (Farida & Setiawan, 2022) study also shows that IT investment strategies have a real influence on company performance.

## **5.4 The Role of Information Technology in Mediating the Relationship Between Innovation and Industry Performance**

To find out the role of IT in mediating the relationship between innovation and business performance. The examination method is done by doing two analysis, namely analysis involving mediating variables (indirect effect) and analysis without involving mediating variables (direct effect). The method of examining the mediating variable with the coefficient difference approach is carried out as follows: if the indirect relationship is significant while the direct relationship is not significant, it is said that IT is a perfect mediation of the relationship between innovation and business performance. If the direct relationship is significant while the indirect relationship is not significant, it is said that IT is not a mediating relationship between innovation and business performance (Munizu et al., 2024).

Based on the coefficient relationship between constructs, it can be seen that the direct relationship coefficient between innovation and business performance is 0,72 and is significant, while the indirect relationship between innovation on IT and business performance is 0,17 and is not significant. From the result of the analysis, it can be stated that IT is not mediation between innovation and Performance Industry. This is in accordance with the result of the previous analysis between IT and Performance Industry that has an insignificant relationship, this condition is strongly influenced by the use of IT in SMEs in Bali which is generally still relatively limited, the dominant marketing activity is at the local district level with the most method using door to door without IT assistance. Meanwhile, SMEs that market their products for export are still relatively limited. The role of promotion using print and electronic media or the internet is still relatively small. The data in Figure 1 shows that SMEs in Bali generally use the door to door marketing method, which is 70.40%. They generally use promotional media from person to person on a limited scale; this condition is a traditional business management model with limited production quantities.

The result of this study is different from the result of previous studies which state that IT plays an important role as a mediator between innovation and Performance Industry, including a study by (Normal et al. 2023) which states that success in corporate innovation is highly depend on the implementation and creativity of using IT. The result of studies also states that IT enables companies to maintain sustainability and gain success in various market changes so that it can increase profits and Performance Industry (Shabbir & Wisdom, 2020). The result of this study is also different from the result of the study by (Charles & Ochieng, 2023) which states that technology facilitates the acquisition of resources that facilitate internal processes in improving financial performance to improve performance industry. The result of this study differs from the study of (Ashal et al., 2021) which states that IT plays an important role in increasing the output of the same resources to improve business performance. Besides that, it is different from the study result which states that IT is also the most recognized factor to support companies in winning the competition (Ahmed et al., 2020). Thus the hypothesis which states that IT mediates innovation on organizational performance industry cannot be accepted.

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ISSN 2561-8156 (Online) - ISSN 2561-8148 (Print)

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doi: 10.5267/ijidns.2024.1.011

### 3. Conclusion

The results of this study indicate that innovation has a positive and significant effect on industry performance, the increasing innovation will improve industry performance. In addition, innovation also has a positive and significant effect on IT, meaning that the higher the innovation will also encourage the higher use of IT. The next finding also shows that IT has a positive but not significant effect on industry performance. In addition, IT also does not mediate the relationship between innovation and industry performance. This is due to the low use of IT among SMEs entrepreneurs in Bali in supporting their business activities, in product marketing still dominant using traditional methods such as door to door. Another contributing factor is that the scope of marketing is generally still limited on a local scale, only a small number of which have exported, so the use of IT is also limited.

### 4. Implication

The findings of this study are expected to provide benefits for the development of entrepreneurship in Bali-Indonesia as an effort to improve industry performance. This condition is a fact that SMEs in Bali-Indonesia cannot be separated from the role of employee production skills because SMEs products in Bali are dominantly based on local wisdom that comes from skills born of Balinese human artistic talent. However, as an effort to improve product marketing, the role of information technology is also very important to be improved.

Technopreneurship which is the integration of innovation with information technology is an important factor in supporting the industry performance of SMEs in Bali-Indonesia. However, nowadays the use of IT is still limited so it is very important to be improved in the future. The result of this study is expected to be a guide line for SMEs and policy makers in their effort to improve industry performance, which is currently still relatively low.

#### 7.1 Theoretical Implications

The results of this study are expected to contribute to the development of science, especially the importance of the role of Technopreneurship for improving the performance of SMEs, especially in Bali Indonesia. SMEs are generally based on the use of local wisdom in supporting their industry performance, but to increase business growth, the role of Technopreneurship is very decisive in winning business competition.

#### 7.2 Practical Implications

It is hoped that the result of this study can give contribution to SMEs in Bali, especially in giving better attention to the use of information technology to improve industry performance, especially in increasing the quantity of marketing to a wider market, namely exports both domestically and abroad. It is also expected that the result of this study can give input for the Balinese government to make policies in an effort to improve the industry performance of SMEs in Bali, especially in facilitating the need for IT facilities which are currently still relatively low in use.

### 5. Limitation of the Research

This study is limited to the analysis of the relationship between innovation and information technology as a predictor of industry performance. Therefore, it is hoped that for future research it is necessary to add other variables that affect industry performance such as production technology, investment, type of education, leadership, work environment and organizational culture. This research was only conducted on SMEs in Bali and private companies so it cannot be used for generalization in an effort to improve industry performance as a whole. Further research can be carried out on companies in non-manufacturing industries or other industrial sizes.

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ISSN 2561-8156 (Online) - ISSN 2561-8148 (Print)

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doi: 10.5267/ijidns.2024.1.011



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ISSN 2561-8156 (Online) - ISSN 2561-8148 (Print)

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doi: 10.5267/i.ijdns.2024.1.011

# Adoption of Information Technology encourages the Creation of Innovation to Improve Industrial Performance in the Digital Era

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## CHRONICLE

### Article history:

Received: Maret 1, 2024

Received in revised format: Mei 25, 2024

Accepted: June 16, 2024

Available online: July 16, 2024

### Keywords:

Digital Era,

Innovation,

Information Technology,

Industrial Performance,

SMEs

## ABSTRACT

Technology is becoming a trend, so this research examines technology information as a driver of productivity for small or medium industries (SMEs). This research examines the impact of innovation on the performance of small and medium enterprises, the impact of information technology on industrial performance, and the role of information technology as a mediator of innovation on company performance. Data was collected through an online survey. The total population is 346, so that many questionnaires were distributed to MSMEs using path analysis and Smart PLS as processing tools. The findings are that innovation has an influence on increasing the productivity of small businesses, innovation has a positive role on information systems, remains insignificant on the performance of the industrial Performance, and information technology does not mediate the relationship between innovation and performance. So it can be said that innovation plays an important role in improving company performance.

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## 1. Introduction

Indonesia's digital economy is the highest in ASEAN, growing at 12% annually. There are excellent products in many areas, but many digital processes have not been touched. SMEs have a strategic role, but challenges such as financing, digital. readiness and marketing . From 2020, the total annual consumption of the digital market will be dominated by beauty products, followed by electronics and then food. The keys to MSME development are local wisdom, digital transformation and the role of facilitator of digital transformation / SMEs empowerment. The following factors contribute to the success of SMEs in adopting digital technologies: access to Internet technology, cloud-based data, artificial intelligence, and then the support of policy makers to ensure an adequate regulatory framework and business environment. Strengthening SMEs is a comprehensive effort to improve the ability of SMEs to meet the challenges and opportunities in global business. It is necessary to conduct intensive business training for SMEs and prepare business plans for special economic zones.

The spread of SMEs is increasingly expanding and to be able to access a wide market, many things need to be addressed in various fields, such as technology or what is known as technology, regulations and market balance. Currently the market looks lively but is actually not healthy because there is overlap and this requires improvements from various parties. This small industrial sector is required to innovate, but of course it cannot do it alone because it requires support from universities, non-governmental organizations and the government. Therefore, success in new marketing is an important strategy for companies. (Hsu & Cheng, 2012), research results show that innovation has a positive effect on the business performance of small and medium enterprises (SMEs) in Taiwan's electronics and industrial information. According to research results (Méndez-Picazo et al., 2021), new product launches, new work activities, and new market activities are related to business growth. (Li et al., 2021), research on Turkish manufacturing shows those aspects of innovation (product, process, marketing and management) influence performance. The same thing was also done in the Pakistani manufacturing (Marion & Fixson, 2021) which shows that the nature of innovation can be affected. Likewise, Shang et al. (2020), also said that innovation is certainly a boost to the revival of business performance

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ISSN 2561-8156 (Online) - ISSN 2561-8148 (Print)

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doi: 10.5267/j.ijds.2024.1.011

In the business world, the role of information technology is used in electronic commerce, or known as E-Commerce (e-commerce) or electronic commerce. The online store does business using online communication networks. Online shopping is a part of e-commerce, where the scope of e-commerce is more extensive, not only business, but also cooperation with business partners, customer service, open jobs, etc. In addition to www network technology, online shopping also requires the use of a database or database technology, electronic mail or e-mail (e-mail) and other forms of non-computer technology, such as delivery systems and e-commerce payments (Yasa and Sentosa, 2022). Instruments - change it. Based on the explanations of the above research results, the purpose of this work is to analyze; (1) the impact of innovations in small and medium-sized enterprises on organizational performance; (2) the impact of information technology on operations; and (3) analysis. Based on previous research findings, the use of ICT as a mediator between innovation and business performance is new in this study.

The economy on Bali Island certainly cannot be separated from the role of MSMEs, because they play an important role in expanding employment opportunities and employment, generating GDP, and providing a social safety net for the poor to participate in productive economic activities. However, the contribution of SMEs is not enough to encourage economic growth and increase income. Business performance is defined as the company's ability to achieve goals supported by good management skills, good governance and reliable commitment to achieving business goals (Guluma, 2021). A successful business is born when the company is structured according to the needs and desires of the target market. In addition, the products produced must have high specifications and performance compared to competitors to create a competitive advantage (Heng and Afifah, 2020). Technology entrepreneur can have economic, social and environmental benefits or impacts. The benefits provided from an economic perspective are as 1) Increase efficiency and productivity; 2) Increase income. 3) Create new jobs. To answer these challenges, the role of technology entrepreneur must be played by SMEs to improve their business performance. This research tries to determine whether innovation will help improve SME business performance in Bali. This research also makes a significant contribution in enriching the SME concept developed by previous researchers and shows the importance of techno-entrepreneurship in the development of SME business activities.

## **2. Relationship between variables and hypotheses**

Technology shows that computing is a communication tool for computer software Benbya et al. (2020). IT is defined as a part of a machine that can perform multiple commands. The Office of Communications (1991) explains that the term IT is used to describe new technologies and their applications, including all aspects of micro-devices, satellites and computers used as technology. Based on all these definitions, we can say that information technology is a part of information technology. The use of information technology has been widely studied. (Akpan et al., 2022) states that computers and other technologies are widely used in all areas of business, technology entrepreneur, finance, education and administration. (Etemad, 2020), claims that IT plays an important role in supporting business success in situations of uncertainty and economic crisis. The use of ICT for business has been studied around the world and it has been found that the entrepreneurship of an individual is related to personal innovation, risk, the ability to understand ideas and take responsibility for success combination (Afawubo and Noglo, 2022). Since IT systems affect products and services, markets, product costs and product differentiation, the success of a company's innovation largely depends on the adoption and innovative use of IT (Paioand Gebauer, 2020). (Guluma, 2021) IT is related to social entrepreneurship. Find out how this affects sustainability. Efficiency and improvement are important to the industry because crossing geographic boundaries requires workers to be computer literate. The indicators used to measure ICT are: 1) Use of information technology as an industrial driver (Pan et al., 2022; 2) Understanding the importance of using information technology (Ofori et al., 2022); 3) and IT usage skills (Kaplan, (2020).

### **2.1 Innovation and Industrial Performance**

Product innovations are one of the key factors of organizational success and an important strategy to increase market share and company performance (Soomro et al., 2021). Innovation lowers production costs and is beneficial in terms of customer satisfaction (Sellitto et al., 2020). Currently, the goals of new marketing are to increase sales, increase market share and initiate new markets (Azzam et al., 2021). According to (Nasir et al., 2020), creativity and innovation play an important role in the growth of organizational performance in the international market. Many previous studies have shown that innovations have a positive impact on business activities (Setini et al., 2020). A study by Purwad et al (2023) shows that creativity affects company performance. Innovation is often considered the lifeblood of an organization and is essential to business. Success in new marketing is an important strategy for companies because their ability to market creatively can help them dominate existing markets or develop new ones and share immediate leadership in the field. (Chen, 2020) research shows that innovation has a positive impact on the business performance of small and medium-sized enterprises (SMEs) in Taiwan's information and electronic industry. According to the research findings of (Bil, 2021), a study of the Turkish manufacturing industry shows that aspects of innovation (product, process, marketing and management) affect performance. The same is done in the manufacturing industry of Pakistan, which shows that it is possible to influence the nature of innovation. Subsequent studies have also shown that innovation has a positive and significant effect on performance (Ma et al 2021). Based on the research findings used as a benchmark in this study, the hypotheses presented in this study are as follows.

H1: Innovation has a positive effect on industrial performance.

### **2.2 Information Technology and Innovation**

To achieve a higher innovation level of SMEs, all activities related to the innovative activities of companies must have the basic support of information technology and communication (Heimonen, 2012), (Blanchard, 2020). (Yüksel, 2020) also stated in his research that companies that invested heavily in information technology and communication achieved a higher level of competition and innovation than companies that did not invest in it. According to (Charles and Ochieng, 2023), ideas that become innovations are usually implemented with information and communication technology initiatives, the results of which usually significantly improve the innovativeness of new products and processes, which is expressed in customer loyalty. promote demand for other products of the organization. At the same time, (Alam and Mohanty, 2022) found in their study that as much as companies want to maximize the innovative activities carried out every day, the introduction and implementation of information and communication technology should be prioritized and, in the context of the appeal, harmonize initiatives in

communication and communication technology for all innovative activities of organizations. These companies also regularly adopted information technology and communication in customer relationship management, production improvement, supply chain management, innovation and other important activities of the organization (Normal et al. 2023); (Munizu et al., 2024). Based on the research results used as reference in this study, the following hypothesis was formulated in this study.

H2: Innovation has a positive effect on information technology.

### 2.3 Information Technology on Industrial Performance

The success of corporate innovation is highly dependent on IT implementation and innovation. Research by (Kim et al., 2021) shows that IT is an important resource for improving business performance. Based on research on the relationship between IT and corporate performance and value (Ashal et al., 2021), IT is a strategic resource and has a significant impact on performance. (Charles & Ochieng, (2023) Studies show that IT has a positive impact on future business performance and increases business value. (Ashal et al., 2021) Research findings also revealed that IT has a primary impact on strategic direction and corporate performance. Research by (Shabbir & Wisdom, 2020) also found that IT investments have significant potential to improve business performance. (Ahmed et al., 2020) Studies have also shown that IT investment strategies have a significant impact on business performance. The hypotheses that can be made by combining the above research findings are as follows.

H3: Information Technology has a positive effect on industrial performance

### 2.4 The Mediating Role of Technology on Information Technology and Industrial Performance

The role of information technology does not directly affect performance improvement, but also indirectly mediates the relationship between innovation and performance. According to a study (Adigwe et al., 2023), one of the many characteristics of the past century is information and communication technologies, which play an important role as a basis for the introduction and adoption of innovations needed by organizations. improve management and productivity. This is how you can survive well in a global and competitive market. Research (Aceto et al., 2018) shows that IT and innovation determine the performance of the company. IT can increase productivity and business efficiency, enabling companies to resist and succeed in market changes (Alves and Alves, 2015). (Kinyua et al., 2015) argue that technology that drives resource acquisition drives internal processes that improve financial efficiency to improve business performance. In addition, IT is said to play an important role in improving business operations by increasing the performance of those assets (Farida and Setiawan, 2022). It is also important to help companies beat the competition (Bressler, 2012). Based on the results of the study, the following hypothesis was presented.

H4: Information technology mediates the relationship between innovation and industrial performance.

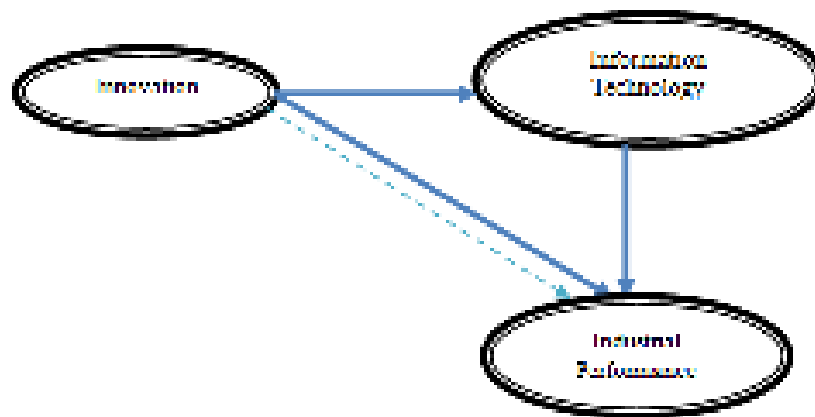


Fig. 1. Conceptual Framework

## 3. Research method

### 3.1 Research Setting and Sample

This research was conducted in 2022-2023 Bali-Indonesia on 15,198 MSMEs (Bali Provincial Industry Office 2019), the number of samples studied was 442,848 MSMEs, the research method used the sample size technique (Rahman et al., 2022), where samples were taken from each district using proportional stratified random sampling, while the selection of respondents used a simple random sampling method. The respondents used as samples were SME business owners who had been in business for one year. Data was obtained by distributing prepared questionnaires directly to 346 respondents throughout Bali. The research object is: SME business performance, innovation which consists of three dimensions, namely: product innovation, process innovation, and marketing and information technology innovation.

### 3.2 Data analysis

This research tests the influence of exogenous and endogenous variables with the SEM-PLS equation. The use of this analysis is due to assumptions (Baak et al., 2020), the data does not have to be normally distributed for all categories: ordinal, interval and proportion. The analysis does not depend on measurement scales, data distribution, and sample size. PLS can be used to validate theory and latent variable correlation, analyzing the innovation construct using a quadratic model, because innovation is divided into three dimensions, namely product, process and marketing innovation. The indicators that form latent variables are reflexive, so the evaluation of the measurement model (measurement model/external model) to measure the validity and reliability of these indicators is: convergent validity; discriminant validity; combined reliability, and Cronbach's alpha. Evaluation of the structural model (Structural Inner Model) to assess the level of accuracy of the model in the research as a

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ISSN 2561-8156 (Online) - ISSN 2561-8148 (Print)

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doi: 10.5267/ijidns.2024.1.011

whole is carried out by analyzing: (a) R-square (R2), (b) Q-Square Predictive. Relevance (Q2), (c) Fit (GoF) and (d) Structural Model Analysis.

#### 4. Findings

##### 4.1 Respondent Profile

The profile of the respondents studied as shown in table 1 shows that of the 346 respondents studied, 47.50 percent were women and 52.50 percent were men. Judging from the age of the respondents, 7.70 percent are between 17-22 years old, 16.50 percent are 23-28 years old, 12.70 percent are 29-34 years old and 63.10 percent are over 34 years old. The respondents studied had a relatively high level of education, namely 56.30 percent with a college education background, 5.90 percent junior high school and 39.80 percent high school. Meanwhile, in terms of the culinary product, 33 percent of them provide food and beverages, 54.30 percent of Beauty and fashion, 17.60 percent of Household equipment

**Table 1 Gender, Age, Education and Products Produced by Respondents**

<b>Gender</b>	<b>Percentage</b>
Male	47.50
Female	52.50
<b>Age (Year)</b>	<b>Percentage</b>
17 - 22	7.70
23 - 28	16.50
29 -34	12.70
> 34	63.10
<b>Education</b>	<b>Percentage</b>
Junior High school	5.90
Senior High school	39.80
College	54.30
<b>Product</b>	<b>Percentage</b>
Culinary	33.00
Beauty and fashion	51.60
Household equipment	17.60

Source: Field research results

##### 4.2 Data Analysis

Based on the result of the calculation of field research data using a structural equation modeling model based on PLS, the analysis can be described as follows.

###### 4.2.1 Outer Model Evaluation

###### 1) Convergent Validity

Convergent validity is a criterion in measuring the validity of reflexive indicators. This evaluation is carried out by examining the outer loading coefficient of each indicator on its latent variables. An indicator is said to be valid, if the coefficient of outer loading is between 0.60 – 0.70 but for an analysis whose theory is not clear then an outer loading of 0.50 is recommended (Sawyer, 2009), and is significant at the alpha level of 0.05 or t- statistics 1.96. The value of the outer loading of each indicator on the latent variable can be seen in Table 1 shows that all indicators are valid. A measurement can be said to be reliable, if the composite reliability and Cronbach alpha have a value greater than 0.70. Composite reliability and Cronbach alpha are a measure of reliability between indicator blocks in the research model. Table 1 shows that all constructs have Cronbach alpha and composite reliability values greater than 0.70, so they have met the valid requirements.

**Table 1. Convergent Validity**

Construct	Indicator	Original Sample	Cronbach Alpha	Composite Reliability	AVE	Description
Industrial Performance	Y11	0.86	0.83	0.85	0.67	Valid
	Y12	0.92				Valid
	Y13	0.82				Valid
	Y14	0.87				Valid
Information Technology	X11	0.79	0.95	0.96	0.85	Valid
	X12	0.92				Valid
	X13	0.95				Valid
Process Innovation	X211	0.83	0.88	0.94	0.77	Valid
	X212	0.85				Valid
	X213	0.84				Valid
	X214	0.85				Valid
Distribution Innovation	X221	0.85	0.78	0.87	0.69	Valid
	X222	0.67				Valid
	X223	0.78				Valid
Product Innovation	X231	0.74	0.87	0.87	0.67	Valid
	X232	0.72				Valid
	X233	0.78				Valid
	X234	0.76				Valid
Innovation			0.93	0.94	0.67	Valid

Source: research data calculation results 2023

## 2) Discriminate Validity

Measurement of the validity of the indicators that make up the latent variable can also be done through discriminate validity. Discriminate validity can be done by comparing the coefficient of the AVE Root ( $\sqrt{\text{AVE}}$  or Square root Average Variance Extracted) of each variable with the correlation value between variables in the model. A variable is said to be valid, if the AVE root is greater than the correlation value between variables in the research model, and the AVE is greater than 0.50.

**Table 2. AVE d**

Construct	AVE	$\sqrt{\text{AVE}}$
<b>Industrial Performance</b>		0.81
<b>Information Technology</b>	0.85	0.92
<b>Process Innovation</b>	0.77	0.85
<b>Distribution Innovation</b>	0.69	0.82
<b>Product Innovation</b>	0.67	0.82
<b>Innovation</b>	0.58	0.74

Source: research data calculation results 2023

Table 2 shows that all constructs show a value of  $\text{AVE} > 0.50$ , the AVE root value ranges from 0.74 - 0.92 while the correlation value between constructs ranges from 0.62 - 0.90, meaning that the discriminate validity test results show that all constructs are valid.

### 4.2.2 Inner Model Evaluation

Evaluation of the structural model (Inner Model) is a measurement to evaluate the level of accuracy of the model in the research as a whole, which is formed through several variables and their indicators. The results of further calculations are described below.

#### 1) Evaluation of Structural Models Through R-Square ( $R^2$ )

$R^2$  can show the strength and weakness of the influence caused by the dependent variable on the independent variable.  $R^2$  can also show the strength of a research model. According to Hair et al. (2014), the  $R^2$  value of 0.75 is classified as a strong model, while the  $R^2$  of 0.50 is classified as a moderate model and the  $R^2$  value of 0.25 is classified as a weak model.

**Table 3. R-Square Index**

Construct	R-Square
<b>Industrial Performance</b>	0.53
<b>Information Technology</b>	0.63
<b>Process Innovation</b>	0.78
<b>Distribution Innovation</b>	0.81

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ISSN 2561-8156 (Online) - ISSN 2561-8148 (Print)

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doi: 10.5267/ijidns.2024.1.011

Source: Survey data calculation results 2023

Table 4 shows that the dimensions of process, distribution and product innovation show a strong  $R^2$  value with each value greater than 0.75. Meanwhile, performance and IT showed moderate values with values ranging from 0.50 to 0,62.

### 2) Structural Model Evaluation through Q-Square Predictive Relevance ( $Q^2$ )

$Q^2$  is a measure of how well the observations made give results to the research model. The criteria for the strength of the model measured based on the  $Q^2$  are as follows: 0.35 (strong model), 0.15 (moderate model), and 0.02 (weak model). The calculation results show the value of  $Q^2 = 1 - (1-0.62)(1-0.80)(1-0.76)(1-0.81)(1-0.52) = 0.99$ , included in the strong model criteria.

### 3) Structural Model Evaluation through Goodness of Fit (GoF)

Goodness of Fit (GoF) is a measurement of the accuracy of the overall model, because it is considered a single measurement of the measurement of the outer model and the measurement of the inner model. The criteria for the strength of the model based on the measurement of Goodness of Fit (GoF) according to (Tellinghuisen, 2022), are as follows: 0.36 (GoF large), 0.25 (GoF medium), and 0.10 (GoF small). The calculation results show the value of  $GoF = \sqrt{0.70 * 0.69} = 0.69$  or includes a strong model.

### 4) Structural Model Analysis

The aim is to determine the effect and significance of exogenous constructs on endogenous constructs. The results of this analysis at the same time answer the research questions posed.

**Table 4. Path Coefficient and Statistical Test**

Construct	Coefficient	P-Value	Description
<b>IT -&gt; Industrial Performance</b>	0.21	0.16	Not Significant
<b>Innovation -&gt; Business Performance</b>	0.56	0.00	Significant
<b>Innovation -&gt; IT</b>	0.78	0.00	Significant
<b>Innovation -&gt; Innovation Process</b>	0.88	0.00	Significant
<b>Innovation -&gt; Innovation Marketing</b>	0.88	0.00	Significant
<b>Innovation -&gt; Innovation Product</b>	0.91	0.00	Significant

Source: Survey data calculation results 2023

The results of this study (Table 4, Figure 1) show that innovation has a positive and significant effect on business performance ( $b = 0.55$  P-Value = 0.00), so hypothesis 1 that innovation has a positive and significant impact on business activity is accepted. Innovation also has a positive and significant effect on IT ( $b = 0.79$  P-value = 0.00), thus hypothesis 2 is accepted that innovation has a positive and significant effect on IT. IT has a positive but not significant impact on business performance ( $b = 0.20$  P-value = 0.14), which means that hypothesis 3 that IT has a positive and significant impact on business performance cannot be accepted. Also, the results of the study show that process, marketing and product innovations can reflect the innovation structure, each of which has an index coefficient of 0.87; 0.89 and 0.90 and all of them were statistically significant (Table 4). Further findings also show that IT is not a mediator between innovation and business performance, the direct relationship between innovation and business performance is shown to be 0.71 and significant, while the indirect relationship between IT innovation and business performance is 0.16 and it is notable. Therefore, hypothesis 4, according to which IT mediates innovation and business performance, cannot be accepted (Table 6).

**Table 5. Direct and Indirect Effect**

Constructs Relationships	Coefficient	P-Value	Description
<b>Direct Effect</b>			
<b>Innovation-&gt; Industrial Performance</b>	0.72	0	Significant
<b>Indirect Effect</b>			
<b>Innovation-&gt; IT-&gt; Industrial Performance</b>	0.17	0.16	Not Significant

## 2. Discussions

### 5.1 The Effect of Innovation on SMEs Industrial Performance

The result of calculation on the field research data shows that innovation has a positive effect of 0.56 and is significant at the 0.05 level on business performance (Table 4). This means that increasing innovation in SMEs will improve the business performance of SMEs in Bali Province. The result of the analysis also shows that the three dimensions of innovation, namely



product, process and distribution innovation are able to significantly shape the innovation construct. The result of this study is in accordance with the result of previous studies stating that product innovation is one of the key factors for organizational success and is an important strategy for increasing market share and business (Etemad, 2020). The process innovation, meanwhile, is useful for reducing production costs and also for satisfying customers (Afawubo & Noglo, 2022). Besides, the target of marketing innovation is to increase sales, market share and open new markets (Guluma, 2021). According to (Pan et al., 2022) creativity and innovation have an important role for the growth of organizational performance in the global market. A company's ability to trade innovation can help dominate current markets or develop new markets, contributing to continued industrial leadership. Thus, success in commercializing innovation is an important strategy for companies (Munizu et al., 2024).

### **5.2 The Effect of Innovation on Information Technology**

The result of analysis in Table 4 shows that innovation has a positive effect of 0,78 and is significant in 0,05 level of significant on IT, it mean that the increasing of innovation both product, process and marketing innovation will boost higher of using IT. The result of this study is in accordance with the underlying theory of this research, that there is a positive relationship between innovation and IT. The result of this study is in accordance with the result of previous studies stating that the information and communication technology also plays an important role in the new millennium companies, since its adoption and implementation in business activities generates, on one hand, a higher level of process innovation (Kaplan, (2020). SMEs to achieve a higher level of innovation, all activities related to innovation made by companies, should have a basic support of information technology and communication (Afawubo & Noglo, 2022), (Guluma, 2021). Study by (Ofori et al., 2022) stated that one of the many elements that characterize the present century is the information and communication technology, which plays a fundamental role in establishing the basis for the adoption and implementation of the innovation activities that the organizations need to improve management and production methods, which will allow them to survive in a highly globalized and competitive market.

### **5.3 The Effect of Information Technology on Industrial Performance**

The result of the analysis in Table 4 shows that IT has a positive effect on business performance, meaning that the increasing use of information technology will encourage higher business performance. This means that the result is in accordance with the underlying theory of this research, that there is a positive relationship between IT and performance. However, this relationship is not significant at the 0.05 level as shown in Table 5. The result of this calculation is in accordance with the reality on the ground that the use of IT among SMEs in Bali Province is still limited. SMEs in Bali Province in marketing their products dominantly still use traditional methods, namely door-to-door. The role of promotion using print and electronic media or the internet is still relatively small. The data shows that SMEs in Bali generally use the door to door marketing method, which is 70.40%. They generally use promotional media from person to person on a limited scale; this condition is a traditional business management model with limited production quantities. Of all respondents studied, only 22.40% have used modern information technology in the form of the internet in marketing their products. In addition, there are also as many as 7.10% of SMEs that use other methods besides the two methods, namely handing over to collectors or production is ordered only so that it does not require marketing media to sell its products.

The result of this study is different from the result of previous studies which states that IT has a significant effect on performance, including the result of research by (Sellitto et al, 2020) showing that IT is an important valuable resource in improving business performance. (Kinyua et al., 2015) research result on the relationship between IT and firm performance and value shows that IT as a strategic resource has a significant positive effect on performance. The study of Purwadi et al. (2023) shows that IT and innovation determine company performance. (Bil, 2021) study shows that IT shows a positive influence on future company performance and increases firm value. The great potential of IT investment in improving business performance has also been carried out through a study by (Bressler, 2012). (Farida & Setiawan, 2022) study also shows that IT investment strategies have a real influence on company performance.

### **5.4 The Role of Information Technology in Mediating the Relationship Between Innovation and Industrial Performance**

To find out the role of IT in mediating the relationship between innovation and business performance. The examination method is done by doing two analysis, namely analysis involving mediating variables (indirect effect) and analysis without involving mediating variables (direct effect). The method of examining the mediating variable with the coefficient difference approach is carried out as follows: if the indirect relationship is significant while the direct relationship is not significant, it is said that IT is a perfect mediation of the relationship between innovation and business performance. If the direct relationship is significant while the indirect relationship is not significant, it is said that IT is not a mediating relationship between innovation and business performance (Munizu et al., 2024).

Based on the coefficient relationship between constructs, it can be seen that the direct relationship coefficient between innovation and business performance is 0,72 and is significant, while the indirect relationship between innovation on IT and business performance is 0,17 and is not significant. From the result of the analysis, it can be stated that IT is not mediation between innovation and industrial Performance. This is in accordance with the result of the previous analysis between IT and industrial Performance that has an insignificant relationship, this condition is strongly influenced by the use of IT in SMEs in Bali which is generally still relatively limited, the dominant marketing activity is at the local district level with the most method using door to door without IT assistance. Meanwhile, SMEs that market their products for export are still relatively limited. The role of promotion using print and electronic media or the internet is still relatively small. The data in Figure 1 shows that SMEs in Bali generally use the door to door marketing method, which is 70.40%. They generally use promotional media from person to person on a limited scale; this condition is a traditional business management model with limited production quantities.

The result of this study is different from the result of previous studies which state that IT plays an important role as a mediator between innovation and industrial Performance, including a study by (Normal et al. 2023) which states that success in corporate innovation is highly depend on the implementation and creativity of using IT. The result of studies also states that IT enables companies to maintain sustainability and gain success in various market changes so that it can increase profits and industrial Performance (Shabbir & Wisdom, 2020). The result of this study is also different from the result of the study by (Charles &

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ISSN 2561-8156 (Online) - ISSN 2561-8148 (Print)

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doi: 10.5267/ijidns.2024.1.011

Ochieng, 2023) which states that technology facilitates the acquisition of resources that facilitate internal processes in improving financial performance to improve industrial performance. The result of this study differs from the study of (Ashal et al., 2021) which states that IT plays an important role in increasing the output of the same resources to improve business performance. Besides that, it is different from the study result which states that IT is also the most recognized factor to support companies in winning the competition (Ahmed et al., 2020). Thus the hypothesis which states that IT mediates innovation on organizational industrial performance cannot be accepted.

### 3. Conclusion

The results of this study indicate that innovation has a positive and significant effect on industrial performance, the increasing innovation will improve industrial performance. In addition, innovation also has a positive and significant effect on IT, meaning that the higher the innovation will also encourage the higher use of IT. The next finding also shows that IT has a positive but not significant effect on industrial performance. In addition, IT also does not mediate the relationship between innovation and industrial performance. This is due to the low use of IT among SMEs entrepreneurs in Bali in supporting their business activities, in product marketing still dominant using traditional methods such as door to door. Another contributing factor is that the scope of marketing is generally still limited on a local scale, only a small number of which have exported, so the use of IT is also limited.

### 4. Implication

The findings of this study are expected to provide benefits for the development of entrepreneurship in Bali-Indonesia as an effort to improve industrial performance. This condition is a fact that SMEs in Bali-Indonesia cannot be separated from the role of employee production skills because SMEs products in Bali are dominantly based on local wisdom that comes from skills born of Balinese human artistic talent. However, as an effort to improve product marketing, the role of information technology is also very important to be improved. Technopreneurship which is the integration of innovation with information technology is an important factor in supporting the industrial performance of SMEs in Bali-Indonesia. However, nowadays the use of IT is still limited so it is very important to be improved in the future. The result of this study is expected to be a guide line for SMEs and policy makers in their effort to industrial performance, which is currently still relatively low.

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ISSN 2561-8156 (Online) - ISSN 2561-8148 (Print)

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doi: 10.5267/ijidns.2024.1.011

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ISSN 2561-8156 (Online) - ISSN 2561-8148 (Print)

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Originality of the work: Acceptable

Subject relevance: Acceptable

Professional/industrial relevance: Acceptable

Completeness of the work: Acceptable

Acknowledgement of the work of others by references: Acceptable

Organisation of the manuscript: Acceptable

Clarity in writing tables graphs and illustrations: Acceptable

Likelihood of passing the 'test of time': Acceptable

"Content Quality"



The title used is interesting and appropriate to the current era  
The abstract meets the rules of having objectives, methods and findings  
has been stated in relation to the problems and objectives of this research  
Literature is sufficient  
The method and results are very good

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In the arrangement of sentences, there are still some writings that are copied and  
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Add literature related to this journal  
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the results are quite clear

Add literature related to this journal

Recommendation: Accepted with minor revisions



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Date: April 9, 2024

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## Adoption of information technology encourages the creation of innovation to improve industrial performance in the digital era

Putu Ngurah Suyatna Yasa<sup>a\*</sup>

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### ABSTRACT

#### Article history:

Received January 9, 2024

Received in revised format

February 18, 2024

Accepted April 9 2024

Available online

April 9 2024

#### Keywords:

Digital Era

Innovation

Information Technology

Industrial Performance

SMEs

Technology is becoming a trend, so this research examines technology information as a driver of productivity for small or medium industries (SMEs). This research examines the impact of innovation on the performance of small and medium enterprises, the impact of information technology on industrial performance, and the role of information technology as a mediator of innovation on company performance. Data was collected through an online survey. The total population is 346, so that many questionnaires were distributed to MSMEs using path analysis and Smart PLS as processing tools. The findings are that innovation has an influence on increasing the productivity of small businesses, innovation has a positive role on information systems, remains insignificant on the performance of industrial Performance, and information technology does not mediate the relationship between innovation and performance. So it can be said that innovation plays an important role in improving company performance.

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### 1. Introduction

Indonesia's digital economy is the highest in ASEAN, growing at 12% annually. There are excellent products in many areas, but many digital processes have not been touched. Small and medium enterprises (SMEs) have a strategic role, but challenges such as financing, digital readiness and marketing. From 2020, the total annual consumption of the digital market will be dominated by beauty products, followed by electronics and then food. The keys to Micro, Small & Medium Enterprises (MSME) development are local wisdom, digital transformation, and the role of facilitator of digital transformation / SMEs empowerment. The following factors contribute to the success of SMEs in adopting digital technologies: access to Internet technology, cloud-based data, artificial intelligence, and then the support of policy makers to ensure an adequate regulatory framework and business environment. Strengthening SMEs is a comprehensive effort to improve the ability of SMEs to meet the challenges and opportunities in global business. It is necessary to conduct intensive business training for SMEs and prepare business plans for special economic zones. The spread of SMEs is increasingly expanding and to be able to access a wide market, many things need to be addressed in various fields, such as technology or what is known as technology, regulations, and market balance. Currently the market looks lively but is not healthy because there is overlap and this requires improvements from various parties. This small industrial sector is required to innovate, but of course it cannot do it alone because it requires support from universities, non-governmental organizations, and the government. Therefore, success in new marketing is an important strategy for companies. Hsu and Cheng (2012) showed that innovation has a positive effect on the business performance of SMEs in Taiwan's electronics and industrial information. According to research results (Méndez-Picazo et al., 2021), new product launches, new work activities, and new market activities are related to business growth. Li et al. (2021) performed research on Turkish manufacturing and showed those aspects of innovation (product, process, marketing and management) influence performance. The same thing was also done in Pakistani manufacturing (Marion &

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ISSN 2291-6830 (Online) - ISSN 2291-6822 (Print)

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doi: 10.5267/j.uscm.2024.4.006

Fixson, 2021) which shows that the nature of innovation can be affected. Likewise, Shang et al. (2020), also said that innovation is certainly a boost to the revival of business performance.

In the business world, the role of information technology is used in electronic commerce or known as E-Commerce (e-commerce) or electronic commerce. The online store does business using online communication networks. Online shopping is a part of e-commerce, where the scope of e-commerce is more extensive, not only business, but also cooperation with business partners, customer service, open jobs, etc. In addition to www network technology, online shopping also requires the use of a database or database technology, electronic mail, or e-mail and other forms of non-computer technology, such as delivery systems and e-commerce payments (Yasa & Sentosa, 2022).

Based on the explanations of the above research results, the purpose of this work is to analyze; (1) the impact of innovations in small and medium-sized enterprises on organizational performance; (2) the impact of information technology on operations; and (3) analysis. Based on previous research findings, the use of ICT as a mediator between innovation and business performance is new in this study.

The economy on Bali Island certainly cannot be separated from the role of MSMEs, because they play an important role in expanding employment opportunities and employment, generating GDP, and providing a social safety net for the poor to participate in productive economic activities. However, the contribution of SMEs is not enough to encourage economic growth and increase income. Business performance is defined as the company's ability to achieve goals supported by good management skills, good governance and reliable commitment to achieve business goals (Guluma, 2021). A successful business is born when the company is structured according to the needs and desires of the target market. In addition, the products produced must have high specifications and performance compared to competitors to create a competitive advantage (Heng & Afifah, 2020). Technology entrepreneurs can have economic, social, and environmental benefits or impacts. The benefits provided from an economic perspective are as 1) Increase efficiency and productivity; 2) Increase income. 3) Create new jobs. To answer these challenges, the role of technology entrepreneur must be played by SMEs to improve their business performance. This research tries to determine whether innovation will help improve SME business performance in Bali. This research also makes a significant contribution in enriching the SME concept developed by previous researchers and shows the importance of techno-entrepreneurship in the development of SME business activities.

## **2. Relationship between variables and hypotheses**

Technology shows that computing is a communication tool for computer software (Benbya et al., 2020). Information technology (IT) is defined as a part of a machine that can perform multiple commands. The Office of Communications (Popkin, 1991) explains that the term IT is used to describe new technologies and their applications, including all aspects of micro-devices, satellites and computers used as technology. Based on all these definitions, we can say that information technology is a part of information technology. The use of information technology has been widely studied. Akpan et al. (2022) reported that computers and other technologies are widely used in all areas of business, technology entrepreneur, finance, education, and administration. Etemad (2020) claims that IT plays an important role in supporting business success in situations of uncertainty and economic crisis. The use of ICT for business has been studied around the world and it has been found that the entrepreneurship of an individual is related to personal innovation, risk, the ability to understand ideas and take responsibility for success combination (Afawubo & Noglo, 2022). Since IT systems affect products and services, markets, product costs and product differentiation, the success of a company's innovation largely depends on the adoption and innovative use of IT (Paibold Gebauer, 2020). According to Guluma (2021), IT is related to social entrepreneurship and finds out how this affects sustainability. Efficiency and improvement are important to the industry because crossing geographic boundaries requires workers to be computer literate. The indicators used to measure ICT are: 1) Use of information technology as an industrial driver (Pan et al., 2022); 2) Understanding the importance of using information technology (Ofori et al., 2022); 3) and IT usage skills (Kaplan, 2020).

### *2.1 Innovation and Industrial Performance*

Product innovations are one of the key factors of organizational success and an important strategy to increase market share and company performance (Soomro et al., 2021). Innovation lowers production costs and is beneficial in terms of customer satisfaction (Sellitto et al., 2020). Currently, the goals of new marketing are to increase sales, increase market share and initiate new markets (Azzam et al., 2021). According to (Nasir et al., 2020), creativity and innovation play an important role in the growth of organizational performance in the international market. Many previous studies have shown that innovations have a positive impact on business activities (Setini et al., 2020). A study by Purwad et al. (2023) shows that creativity affects company performance. Innovation is often considered the lifeblood of an organization and is essential to business. Success in new marketing is an important strategy for companies because their ability to market creatively can help them dominate existing markets or develop new ones and share immediate leadership in the field. Chen (2020) shows that innovation has a positive impact on the business performance of SMEs in Taiwan's information and electronic industry. According to the research findings of (Bil, 2021), a study of the Turkish manufacturing industry shows that aspects of innovation (product, process, marketing and management) affect performance. The same is done in the manufacturing industry of Pakistan, which shows that it is possible to influence the nature of innovation. Subsequent studies have also shown that innovation has a

positive and significant effect on performance (Ma et al., 2021). Based on the research findings used as a benchmark in this study, the hypotheses presented in this study are as follows.

**H<sub>1</sub>:** *Innovation has a positive effect on industrial performance.*

## 2.2 Information Technology and Innovation

To achieve a higher innovation level of SMEs, all activities related to the innovative activities of companies must have the basic support of information technology and communication (Heimonen, 2012; Blanchard, 2020). Yüksel (2020) also stated in his research that companies that invested heavily in information technology and communication achieved a higher level of competition and innovation than companies that did not invest in it. According to Charles and Ochieng (2023), ideas that become innovations are usually implemented with information and communication technology initiatives, the results of which usually significantly improve the innovativeness of new products and processes, which is expressed in customer loyalty. promote demand for other products of the organization. At the same time, Alam and Mohanty (2022) found in their study that as much as companies want to maximize the innovative activities carried out every day, the introduction and implementation of information and communication technology should be prioritized and, in the context of the appeal, harmonize initiatives in communication and communication technology for all innovative activities of organizations. These companies also regularly adopted information technology and communication in customer relationship management, production improvement, supply chain management, innovation and other important activities of the organization (Normal et al., 2023; Munizu et al., 2024). Based on the research results used as reference in this study, the following hypothesis was formulated in this study.

**H<sub>2</sub>:** *Innovation has a positive effect on information technology.*

## 2.3 Information Technology on Industrial Performance

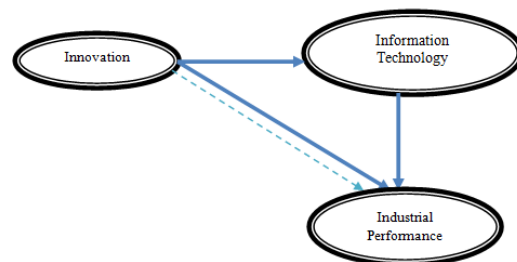
The success of corporate innovation is highly dependent on IT implementation and innovation. Research by Kim et al. (2021) shows that IT is an important resource for improving business performance. Based on research on the relationship between IT and corporate performance and value (Ashal et al., 2021), IT is a strategic resource and has a significant impact on performance. Charles and Ochieng (2023) showed that IT has a positive impact on future business performance and increases business value. (Ashal et al., 2021) Research findings also revealed that IT has a primary impact on strategic direction and corporate performance. Research by Shabbir and Wisdom (2020) also found that IT investments have significant potential to improve business performance. Ahmed et al. (2020) reported that IT investment strategies have a significant impact on business performance. The hypotheses that can be made by combining the above research findings are as follows.

**H<sub>3</sub>:** *Information Technology has a positive effect on industrial performance.*

## 2.4 The Mediating Role of Technology on Information Technology and Industrial Performance

The role of information technology does not directly affect performance improvement, but also indirectly mediates the relationship between innovation and performance. According to Adigwe et al. (2023), one of the many characteristics of the past century is information and communication technologies, which play an important role as a basis for the introduction and adoption of innovations needed by organizations. improve management and productivity. This is how you can survive well in a global and competitive market. Research by Aceto et al. (2018) shows that IT and innovation determine the performance of the company. IT can increase productivity and business efficiency, enabling companies to resist and succeed in market changes (Alves & Alves, 2015). Kinyua et al. (2015) argue that technology that drives resource acquisition drives internal processes that improve financial efficiency to improve business performance. In addition, IT is said to play an important role in improving business operations by increasing the performance of those assets (Farida & Setiawan, 2022). It is also important to help companies beat the competition (Bressler, 2012). Based on the results of the study, the following hypothesis was presented.

**H<sub>4</sub>:** *Information technology mediates the relationship between innovation and industrial performance.*



**Fig. 1.** Conceptual Framework



### 3. Research method

#### 3.1 Research Setting and Sample

This research was conducted in 2022-2023 Bali-Indonesia on 15,198 MSMEs (Bali Provincial Industry Office 2019), the number of samples studied was 442,848 MSMEs, the research method used the sample size technique (Rahman et al., 2022), where samples were taken from each district using proportional stratified random sampling, while the selection of respondents used a simple random sampling method. The respondents used as samples were SME business owners who had been in business for one year. Data was obtained by distributing prepared questionnaires directly to 346 respondents throughout Bali. The research object is: SME business performance, innovation which consists of three dimensions, namely: product innovation, process innovation, and marketing and information technology innovation.

#### 3.2 Data analysis

This research tests the influence of exogenous and endogenous variables with the SEM-PLS equation. The use of this analysis is due to assumptions (Baak et al., 2020), the data does not have to be normally distributed for all categories: ordinal, interval and proportion. The analysis does not depend on measurement scales, data distribution, and sample size. PLS can be used to validate theory and latent variable correlation, analyzing the innovation construct using a quadratic model, because innovation is divided into three dimensions, namely product, process and marketing innovation. The indicators that form latent variables are reflexive, so the evaluation of the measurement model (measurement model/external model) to measure the validity and reliability of these indicators is: convergent validity; discriminant validity; combined reliability, and Cronbach's alpha. Evaluation of the structural model (Structural Inner Model) to assess the level of accuracy of the model in the research is carried out by analyzing: (a) R-square (R<sup>2</sup>), (b) Q-Square Predictive. Relevance (Q<sup>2</sup>), (c) Fit (GoF) and (d) Structural Model Analysis.

### 4. Findings

#### 4.1 Respondent Profile

The profile of the respondents studied as shown in Table 1 shows that of the 346 respondents studied, 47.50 percent were women and 52.50 percent were men. Judging from the age of the respondents, 7.70 percent are between 17-22 years old, 16.50 percent are 23-28 years old, 12.70 percent are 29-34 years old, and 63.10 percent are over 34 years old. The respondents studied had a relatively high level of education, namely 56.30 percent with a college education background, 5.90 percent junior high school and 39.80 percent high school. Meanwhile, in terms of the culinary product, 33 percent of them provide food and beverages, 54.30 percent of Beauty and fashion, 17.60 percent of Household equipment.

**Table 1**  
Gender, Age, Education and Products Produced by Respondents

Gender	Percentage
Male	47.50
Female	52.50
Age (Year)	Percentage
17 - 22	7.70
23 - 28	16.50
29 - 34	12.70
> 34	63.10
Education	Percentage
Junior High school	5.90
Senior High school	39.80
College	54.30
Product	Percentage
Culinary	33.00
Beauty and fashion	51.60
Household equipment	17.60

Source: Field research results

#### 4.2 Data Analysis

Based on the result of the calculation of field research data using a structural equation modeling model based on PLS, the analysis can be described as follows.

##### 4.2.1 Outer Model Evaluation

#### 1) Convergent Validity

Convergent validity is a criterion in measuring the validity of reflexive indicators. This evaluation is carried out by examining the outer loading coefficient of each indicator on its latent variables. An indicator is said to be valid, if the coefficient of outer loading is between 0.60 – 0.70 but for an analysis whose theory is not clear then an outer loading of 0.50 is recommended (Sawyer, 2009),

and is significant at the alpha level of 0.05 or t- statistics 1.96. The value of the outer loading of each indicator on the latent variable can be seen in Table 1 shows that all indicators are valid. A measurement can be said to be reliable if the composite reliability and Cronbach alpha have a value greater than 0.70. Composite reliability and Cronbach alpha are a measure of reliability between indicator blocks in the research model. Table 1 shows that all constructs have Cronbach alpha and composite reliability values greater than 0.70, so they have met the valid requirements.

**Table 1**  
Convergent Validity

Construct	Indicator	Original Sample	Cronbach Alpha	Composite Reliability	AVE	Description
Industrial Performance	Y11	0.86	0.83	0.85	0.67	Valid
	Y12	0.92				Valid
	Y13	0.82				Valid
	Y14	0.87				Valid
Information Technology	X11	0.79	0.95	0.96	0.85	Valid
	X12	0.92				Valid
	X13	0.95				Valid
Process Innovation	X211	0.83	0.88	0.94	0.77	Valid
	X212	0.85				Valid
	X213	0.84				Valid
	X214	0.85				Valid
Distribution Innovation	X221	0.85	0.78	0.87	0.69	Valid
	X222	0.67				Valid
	X223	0.78				Valid
Product Innovation	X231	0.74	0.87	0.87	0.67	Valid
	X232	0.72				Valid
	X233	0.78				Valid
	X234	0.76				Valid
<b>Innovation</b>			0.93	0.94	0.67	Valid

Source: research data calculation results 2023

## 2) Discriminate Validity

Measurement of the validity of the indicators that make up the latent variable can also be done through discriminate validity. Discriminate validity can be done by comparing the coefficient of the AVE Root ( $\sqrt{\text{AVE}}$  or Square root Average Variance Extracted) of each variable with the correlation value between variables in the model. A variable is said to be valid, if the AVE root is greater than the correlation value between variables in the research model, and the AVE is greater than 0.50.

**Table 2**  
AVE d

Construct	AVE	$\sqrt{\text{AVE}}$
Industrial Performance		0.81
Information Technology	0.85	0.92
Process Innovation	0.77	0.85
Distribution Innovation	0.69	0.82
Product Innovation	0.67	0.82
<b>Innovation</b>	0.58	0.74

Source: research data calculation results 2023

Table 2 shows that all constructs show a value of  $\text{AVE} > 0.50$ , the AVE root value ranges from 0.74 - 0.92 while the correlation value between constructs ranges from 0.62 - 0.90, meaning that the discriminate validity test results show that all constructs are valid.

### 4.2.2 Inner Model Evaluation

Evaluation of the structural model (Inner Model) is a measurement to evaluate the level of accuracy of the model in the research, which is formed through several variables and their indicators. The results of further calculations are described below.

#### 1) Evaluation of Structural Models Through R-Square ( $R^2$ )

$R^2$  can show the strength and weakness of the influence caused by the dependent variable on the independent variable.  $R^2$  can also show the strength of a research model. According to Hair et al. (2014), the  $R^2$  value of 0.75 is classified as a strong model, while the  $R^2$  of 0.50 is classified as a moderate model and the  $R^2$  value of 0.25 is classified as a weak model.

**Table 3**  
R-Square Index

Construct	Industrial Performance	Information Technology	Process Innovation	Distribution Innovation	Product Innovation
R-Square	0.53	0.63	0.78	0.81	0.83

Source: Survey data calculation results 2023

Table 4 shows that the dimensions of process, distribution and product innovation show a strong  $R^2$  value with each value greater than 0.75. Meanwhile, performance and IT showed moderate values with values ranging from 0.50 to 0.62.

## 2) Structural Model Evaluation through Q-Square Predictive Relevance ( $Q^2$ )

$Q^2$  is a measure of how well the observations made give results to the research model. The criteria for the strength of the model measured based on the  $Q^2$  are as follows: 0.35 (strong model), 0.15 (moderate model), and 0.02 (weak model). The calculation results show the value of  $Q^2 = 1 - (1-0.62)(1-0.80)(1-0.76)(1-0.81)(1-0.52) = 0.99$ , included in the strong model criteria.

## 3) Structural Model Evaluation through Goodness of Fit (GoF)

Goodness of Fit (GoF) is a measurement of the accuracy of the overall model because it is considered a single measurement of the measurement of the outer model and the measurement of the inner model. The criteria for the strength of the model based on the measurement of Goodness of Fit (GoF) according to (Tellinghuisen, 2022), are as follows: 0.36 (GoF large), 0.25 (GoF medium), and 0.10 (GoF small). The calculation results show the value of  $GoF = V \cdot 0.70 * 0.69 = 0.69$  or includes a strong model.

## 4) Structural Model Analysis

The aim is to determine the effect and significance of exogenous constructs on endogenous constructs. The results of this analysis at the same time answer the research questions posed.

**Table 4**

Path Coefficient and Statistical Test

Construct	Coefficient	P-Value	Description
IT → Industrial Performance	0.21	0.16	Not Significant
Innovation → Business Performance	0.56	0.00	Significant
Innovation → IT	0.78	0.00	Significant
Innovation → Innovation Process	0.88	0.00	Significant
Innovation → Innovation Marketing	0.88	0.00	Significant
Innovation → Innovation Product	0.91	0.00	Significant

Source: Survey data calculation results 2023

The results of this study (Table 4) show that innovation has a positive and significant effect on business performance ( $b = 0.55$  P-Value = 0.00), so hypothesis 1 that innovation has a positive and significant impact on business activity is accepted. Innovation also has a positive and significant effect on IT ( $b = 0.79$  P-value = 0.00), thus hypothesis 2 is accepted that innovation has a positive and significant effect on IT. IT has a positive but not significant impact on business performance ( $b = 0.20$  P-value = 0.14), which means that hypothesis 3 that IT has a positive and significant impact on business performance cannot be accepted. Also, the results of the study show that process, marketing, and product innovations can reflect the innovation structure, each of which has an index coefficient of 0.87; 0.89 and 0.90 and all of them were statistically significant (Table 4). Further findings also show that IT is not a mediator between innovation and business performance, the direct relationship between innovation and business performance is shown to be 0.71 and significant, while the indirect relationship between IT innovation and business performance is 0.16 and it is notable. Therefore, hypothesis 4, according to which IT mediates innovation and business performance, cannot be accepted (Table 6).

**Table 5**

Direct and Indirect Effect

Constructs Relationships	Coefficient	P-Value	Description
<b>Direct Effect</b>			
Innovation → Industrial Performance	0.72	0	Significant
<b>Indirect Effect</b>			
Innovation → IT → Industrial Performance	0.17	0.16	Not Significant

The result of analysis in Table 4 shows that innovation has a positive effect of 0.78 and is significant when the level of significance is five percent, which means that the increase of innovation in both product, process and marketing innovation will boost higher use of IT. The result of this study is in accordance with the underlying theory of this research, that there is a positive relationship between innovation and IT. The result of this study is in accordance with the result of previous studies stating that the information and communication technology also play an important role in the new millennium companies, since its adoption and implementation in business activities generates, on one hand, a higher level of process innovation (Kaplan, 2020). SMEs to achieve a higher level of innovation, all activities related to innovation made by companies, should have a basic support of information technology and communication (Afawubo & Noglo, 2022; Guluma, 2021). Study by Ofori et al. (2022) stated that one of the many elements that characterize the present century is the information and communication technology, which plays a fundamental role in establishing the basis for the adoption and implementation of the innovation

activities that the organizations need to improve management and production methods, which will allow them to survive in a highly globalized and competitive market.

#### *4.3 The Effect of Information Technology on Industrial Performance*

The result of the analysis in Table 4 shows that IT has a positive effect on business performance, meaning that the increasing use of information technology will encourage higher business performance. This means that the result is in accordance with the underlying theory of this research, and there is a positive relationship between IT and performance. However, this relationship is not significant at the 0.05 level as shown in Table 5. The result of this calculation is in accordance with the reality on the ground that the use of IT among SMEs in Bali Province is still limited. SMEs in Bali Province in marketing their products dominantly still use traditional methods, namely door-to-door. The role of promotion using print and electronic media, or the internet is still relatively small. The data shows that SMEs in Bali generally use the door-to-door marketing method, which is 70.40%. They generally use promotional media from person to person on a limited scale; this condition is a traditional business management model with limited production quantities. Of all respondents studied, only 22.40% have used modern information technology in the form of the internet in marketing their products. In addition, there are also as many as 7.10% of SMEs that use other methods besides the two methods, namely handing over to collectors or production is ordered only so that it does not require marketing media to sell its products.

The result of this study is different from the result of previous studies which states that IT has a significant effect on performance, including the result of research by Sellitto et al. (2020) showing that IT is an important valuable resource in improving business performance. Kinyua et al. (2015) performed research on the relationship between IT and firm performance and showed that IT as a strategic resource has a significant positive effect on performance. The study of Purwadi et al. (2023) shows that IT and innovation determine company performance. Bil (2021) shows that IT has a positive influence on future company performance and increases the firm value. The great potential of IT investment in improving business performance has also been carried out through a study by Bressler (2012). Farida and Setiawan (2022) study also shows that IT investment strategies have a real influence on company performance.

#### *4.4 The Role of Information Technology in Mediating the Relationship Between Innovation and Industrial Performance*

To find out the role of IT in mediating the relationship between innovation and business performance, the study has been performed by doing two analyses, namely analysis involving mediating variables (indirect effect) and analysis without involving mediating variables (direct effect). The method of examining the mediating variable with the coefficient difference approach is carried out as follows: if the indirect relationship is significant while the direct relationship is not significant, it is said that IT is a perfect mediation of the relationship between innovation and business performance. If the direct relationship is significant while the indirect relationship is not significant, it is said that IT is not a mediating relationship between innovation and business performance (Munizu et al., 2024).

Based on the coefficient relationship between constructs, it can be seen that the direct relationship coefficient between innovation and business performance is 0.72 and is significant, while the indirect relationship between innovation on IT and business performance is 0.17 and is not significant. From the result of the analysis, it can be stated that IT is not a mediation between innovation and industrial Performance. This is in accordance with the result of the previous analysis between IT and industrial Performance that has an insignificant relationship, this condition is strongly influenced by the use of IT in SMEs in Bali, which is generally still relatively limited, the dominant marketing activity is at the local district level with the most method using door to door without IT assistance. Meanwhile, SMEs that market their products for export are still relatively limited. The role of promotion using print and electronic media, or the internet is still relatively small. The data shows that SMEs in Bali generally use the door-to-door marketing method, which is 70.40%. They generally use promotional media from person to person on a limited scale; this condition is a traditional business management model with limited production quantities.

The result of this study is different from the result of previous studies which state that IT plays an important role as a mediator between innovation and industrial Performance, including a study by Normal et al. (2023) which states that success in corporate innovation is highly dependent on the implementation and creativity of using IT. The result of studies also states that IT enables companies to maintain sustainability and gain success in various market changes so that it can increase profits and industrial Performance (Shabbir & Wisdom, 2020). The result of this study is also different from the result of the study by Charles and Ochieng (2023) which states that technology facilitates the acquisition of resources that facilitate internal processes in improving financial performance to improve industrial performance. The result of this study differs from the study of Ashal et al. (2021) which states that IT plays an important role in increasing the output of the same resources to improve business performance. Besides that, it is different from the study result which states that IT is also the most recognized factor to support companies in winning the competition (Ahmed et al., 2020). Thus, the hypothesis which states that IT mediates innovation on organizational industrial performance cannot be accepted.

## 5. Conclusion

The results of this study have indicated that innovation has a positive and significant effect on industrial performance, and that increasing innovation will improve industrial performance. In addition, innovation also has shown a positive and significant effect on IT, meaning that the higher the innovation will also encourage the higher use of IT. The next finding also shows that IT has a positive but not significant effect on industrial performance. In addition, IT also does not mediate the relationship between innovation and industrial performance. This is due to the low use of IT among SMEs entrepreneurs in Bali in supporting their business activities, in product marketing still dominant using traditional methods such as door to door. Another contributing factor is that the scope of marketing is generally still limited on a local scale, only a small number of which have exported, so the use of IT is also limited.

## 6. Implication

The findings of this study are expected to provide benefits for the development of entrepreneurship in Bali-Indonesia as an effort to improve industrial performance. This condition is a fact that SMEs in Bali-Indonesia cannot be separated from the role of employee production skills because SMEs products in Bali are dominantly based on local wisdom that comes from skills born of Balinese human artistic talent. However, as an effort to improve product marketing, the role of information technology is also very important to be improved. Technopreneurship, which is the integration of innovation with information technology, is an important factor in supporting the industrial performance of SMEs in Bali-Indonesia. However, nowadays the use of IT is still limited so it is very important to be improved in the future. The result of this study is expected to be a guideline for SMEs and policy makers in their effort to industrial performance, which is currently still relatively low.

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Best Regard  
Yasa

Pada Jum, 5 Apr 2024 pukul 06.02 Editor Growing Science  
<[egrowingscience@gmail.com](mailto:egrowingscience@gmail.com)> menulis:

Dear Mr Yasa (and co-authors, if any),

We and the Team have reviewed your article in submission ID: 3323 with the research title 'Contribution on Creative Industry Performance', we are happy to say that we consider it a good candidate for publication, after a number of revisions have been made.

Please make revisions to some of the reviewer's suggestions

Please read the results of each reviewer's review

Please be assured that few submissions are accepted without requiring revision.

We hope to receive your reshipment within the next 10 days maximum.

Greetings,

Prof. Dr. Sadjadi

International Journal of Data and Network Science

Reviewer 1

"Management Transkip"

Originality of the work: Acceptable

Subject relevance: Acceptable

Professional/industrial relevance: Acceptable

Completeness of the work: Acceptable

Acknowledgement of the work of others by references: Acceptable

Organisation of the manuscript: Acceptable

Clarity in writing tables graphs and illustrations: Acceptable

Likelihood of passing the 'test of time': Acceptable

"Content Quality"

The title used is interesting and appropriate to the current era

The abstract meets the rules of having objectives, methods and findings

has been stated in relation to the problems and objectives of this research

Literature is sufficient

The method and results are very good

Recommendation: Accepted

Reviewer 2

In the arrangement of sentences, there are still some writings that are copied and pasted and become long and unclear sentences

The method is more refined

the results are quite clear

Add literature related to this journal

Recommendation: Accepted with minor revisions

## CONTRIBUTING AUTHOR COPYRIGHT RELEASE FORM

As author of the article/contribution entitled “Adoption of information technology encourages the creation of innovation to improve industrial performance in the digital era”

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Signature: 

Date: April, 9 2024