

# INNOVATIVE FLOATING MARKET MANAGEMENT INTEGRATED WITH DIGITAL TECHNOLOGY TO DEVELOP TALING CHAN FLOATING MARKET FOR STABILITY IN TERMS OF ECONOMY, SOCIETY, COMMUNITY, AND ENVIRONMENT

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## Abstract

Taling Chan Floating Market in Thailand is a unique business market which has significant effect locally and nationally. However, the achievement of long-term sustainability with the help of this market is most crucial. The achievement of sustainability in terms of economic, social and environmental is a challenging task. To address sustainability, this study proposed the integration between innovation and digital technology and examined the effect on sustainability. A survey carried out in Taling Chan Floating Market in Thailand to collect primary data. 225 questionnaires were received from the respondents. Results of the study highlighted that the integration between innovation and digital technology has influential role to promote sustainability in terms of economic, social and environmental. Findings show that; external knowledge and internal innovation can promote innovation management which can further enhance the sustainability. Results of the study can be used to enhance sustainability through Floating Market of Thailand.

**Keywords:** External knowledge, internal innovation, innovation management, digital technology, sustainability, Taling Chan Floating Market.

## 1. Introduction

Taling Chan Floating Market in Thailand is a traditional floating market where boats tie up along the river to sell a variety of food and drink (Chanprasert, 2021; Tuprakay, Suksabye, Menchai, & Tuprakay, 2014). This is one of the important business markets of Thailand which has significant importance locally as well as nationally. Because this market is generating several business opportunities for the people which has the potential to increase economic welfare. Furthermore, this market is also producing number of job opportunities for the local people. Additionally, by contributing locally this market contributing to the economic development of Thailand. Therefore, this industry has central importance in Thailand and leading towards welfare.

However, sustainability is one of the major challenges which is needed to address by the practitioners as well as academicians (Klinsrisuk & Pechdin, 2022; Lo & Janta, 2021). Although, this Floating Market in Thailand leading towards sustainability, but a significant level of sustainability achievement is required. Sustainability in terms of economic development is important for the welfare of the people. Although, Floating Market contributes towards economic sustainability however, the long-term sustainability is needed to achieve. Additionally, with the increase in business operations of Floating Market, the pollution in the environment is increasing significantly in the water due to the business market is also

increasing. Therefore, the environmental sustainability issue is increasing due to the floating Market. All the issues related to the economics, social and environmental sustainability are needed to address with the help of various strategies.

The current study highlighted that sustainability can be achieved with the help of innovation management (Friedman & Ormiston, 2022). The management of various ideas to promote business performance led to the sustainability. To protect the environment, several innovative methods are available. But innovation management is also a challenge. The challenge of innovation management can be managed through external knowledge and internal innovation (Hameed, Nisar, & Wu, 2021). Therefore, the study proposed that innovation management is one of the important aspects which always can promote sustainability. Along with the innovation management, digital technology also has influential role (Strengers, Dahlgren, Pink, Sadowski, & Nicholls, 2022). Digital technology implementation in Floating Market can increase sustainability.

Finally, the objective of the study is to highlight the role of integration between innovation and digital technology to promote sustainability in Thailand. The integration between innovation and digital technology is considered in relation to the Floating Market of Thailand. Number of studies carried out on innovation as well as business sustainability (Menne et al., 2022), however, the integration between innovation and digital technology is not considered in relation to the sustainability through Floating Market of Thailand. In this way, the current study has central importance for the literature and practical implications may help to promote sustainability.

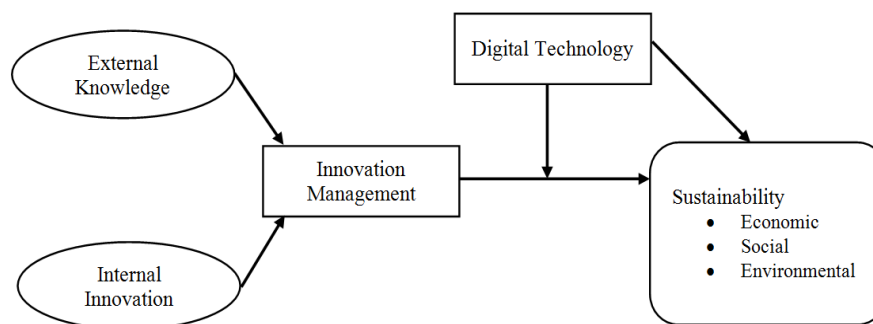
## **2. Literature Review**

### **2.1 Framework Development**

Sustainability and various activities in any community is most important to achieve (Simpson, Hass, Panchal, & McGowan, 2022). Because it has significant direct impact on the society welfare. The current study considered sustainability in relation to the three important aspects. This study considered economic sustainability, social sustainability and environmental sustainability. All these sustainability's are most important to achieve in a society. Because economic sustainability is directly linked with the income generating activities of the people living in a society. The sustainability in income generating activities help to generate economic welfare and it has contribution to the nation's economy. Similarly social sustainability is also important because it is also linked with the welfare of people. The role of environmental sustainability is also critical because it has direct effect on the health of people. To achieve the three types of sustainability, the role of Floating Market is most important in Thailand. However, it is important to promote sustainability in different activities of Floating Market. In this way this study addressed the integration between innovation and digital technology. The promotion of innovative activities along with the digital technology has a potential to achieve sustainability in all aspects. In this way, this study developed a study framework. Numbers of studies are carried on innovation, digital technology and sustainability, however, the integration between these factors is not considered in relation to the Floating Market of

Thailand. Additionally, in this market the innovation management is not addressed in relation to the external knowledge along with internal innovation. The framework is developed by considering the relationship between external knowledge, internal innovation, innovation management, digital technology and sustainability which is highlighted in Figure 1.

**Figure 1: The relationship between external knowledge, internal innovation, innovation management, digital technology and sustainability**



## 2.2 Sustainability

Sustainability means meeting our own needs without compromising the capacity of future generations to meet their own needs. This study considered the sustainability in relation to the three important aspects which has significant impact on the society. First the study considered economic sustainability. The economic sustainability is most important in Thailand because it help to increase the welfare of the people by increasing the level of income among them (Hoseinbor, Mousavi, & Aminifard, 2022). Economic sustainability has the potential to provide various business opportunities for the people of Thailand which ultimately increases the welfare of the people and contributes towards the economic development of Thailand. However, economic sustainability is not easy to achieve because long term sustainability is one of the challenges for nations. The short-term sustainability can be achieved; however, long term sustainability achievement is a problem. Government of Thailand has provided several opportunities for the people to generate income through various activities, however, the sustainability is required to achieve. Furthermore, economic sustainability is also important because there is a certain level of poverty exists in Thailand. To decrease in the level of poverty in Thailand it is also important to promote economics sustainability which will highlight several opportunities for the people to generate income. Ultimately the increase in income will cause to decrease the poverty level. Second, this study considered social sustainability (Ait Sidhoum, Dakpo, & Latruffe, 2022). Majorly the social sustainability is also linked with the community as well as worker and employees working in any organisation. Majorly this study considered social sustainability in relation to the people living in any specific area. Generally, social sustainability is based on the local community and the connection between the people. It is also linked with the social capital which has vital importance in the society to resolve various problems. Third, the current study also considered environmental sustainability. The

environmental issues are increasing globally with the high speed. With the increase in various business operations the pollution in the environment is increasing significantly which causes to increase the environment issues by decreasing the environmental performance. Environmental sustainability is based on the healthy atmosphere for the people. However, in various parts of Thailand the environment sustainability is decreasing significantly. The Floating Market in Thailand can contribute significantly to decrease the pollution and increase the environmental performance in a specific area of Thailand. In this way the current study considered environmental sustainability in relation to the Floating Market of Thailand. All these types of sustainability have major influence in Thailand in relation to the Floating Market.

## 2.2 Innovation Management

The management of innovation is more significant among the organizations as well as different markets. Because the innovation management has the potential to lead various innovative methods which can help to increase the level of performance (Fernando, Jabbour, & Wah, 2019; Hameed et al., 2021). Although there are several types of innovation among the organizations, however, the management of all innovation types to produce good results is most important. But the management of innovation is not an easy task and it requires special intention along with the strategies. This study considered external knowledge and internal innovation to manage the innovation management. According to the current study, the external knowledge has the potential to manage innovative ideas. Furthermore, internal innovation among the organizations also has central importance in innovation management.

This study addressed that external knowledge is based on the knowledge from the suppliers, customers, distributors and external partners (Hameed et al., 2021). The information received from these stakeholders may help to produce various services and well as products in line with the expectations of the customer. The external knowledge also provides various information related to the competitors. Therefore, information received from external sources is based on the market information and market information has central importance to manage innovative ideas. In this way, the current study proposed that external knowledge has significant role to enhance innovation management. Furthermore, the second most important element of innovation management is internal innovation. The knowledge received from external sources may have to experience internal innovation among the organization. The internal innovation is majorly based on the employees of the organization. The communication between the employees to generate innovative ideas and the implementation of innovation has major importance in innovation management, therefore the current study proposed following hypotheses;

**Hypothesis 1:** External knowledge has positive effect on innovation management.

**Hypothesis 2:** Internal innovation has positive effect on innovation management.

The proper management of innovation among the organization can play most influential role to achieve sustainability. All those achievements of sustainability is one of the tough task for the organizations, however, it can be achieved with the help of innovation activities. As in the comparative business environment, innovation has a potential to provide competitive

advantage (Lestari, LEON, Widyastuti, BRABO, & Putra, 2020; Nimfa et al., 2021) which can lead to the sustainability in a competitive business market. The management of innovation in Floating Market of Thailand provide various income generating activities which can further lead to the economic sustainability. It also has the influence on social sustainability in any society. The management of Ideas has the potential to increase sustainability in both economic as well as social. Most importantly the environment sustainability can be influenced with the help of innovative ideas. The innovation management in Floating Market of Thailand can produce various mechanisms which can reduce the impact of business on environment and ultimately it will increase the environmental performance. The pollution in the environment due to the business activities can be managed with the help of new technology. Therefore, the current study proposed that innovation management has the potential to promote sustainability in relation to the economic, social and environmental. Therefore, it is proposed that;

**Hypothesis 3:** Innovation management has positive effect on sustainability.

### 2.3 Digital Technology

Digital technologies are electronic tools, systems, devices and resources that generate, store or process data (Qureshi, Khan, Raza, Imran, & Ismail, 2021). In the comparative business environment, the role of digital technology is increasing significantly. The adoption of latest technology in business activities always plays an important role to achieve higher performance. In the current 4th Industrial Revolution, the technology in business activities is increasing significantly and it is most essential for the companies to adopt because it has several advantages (Oke & Fernandes, 2020) in relation to the economics, social and environmental sustainability. The digital technology generally based on specific tools along with the different devices which can store the data and provide quick feedback in limited time along with the maximum accuracy. With the introduction of digital technology, the process of manufacturing of various products and delivery of services is increasing with the significant level of quality. Therefore, the introduction of digital technology is most important in Floating Market of Thailand. The current study shows that digital technology also led to the sustainability which is also reported in several previous studies. In the current study, digital technology is also playing a moderating role between innovation management and sustainability. Although, it is observed that innovation management has positive effect on sustainability and digital technology has the potential to influence this positive relationship between innovation management and sustainability. Finally, following hypotheses are proposed;

**Hypothesis 4:** Digital technology has positive effect on sustainability.

**Hypothesis 5:** Digital technology moderates the relationship between innovation management and sustainability.

### 3. Methodology

The current study designed a survey questionnaire to examine the relationship between external knowledge, internal innovation, innovation management, technology management and sustainability. The development of questionnaire is preferred to adopt scale items from

previous studies. The external knowledge is measured by using the relation of the businesses with the suppliers', customers and various external partners. The relationship of the business with suppliers and customers help to provide various information related to the market which can help to the innovation. Internal innovation is measured by using the communication between the employees to utilize various ideas to enhance innovation activities. Because innovation internally can only be generated by a positive communication between the employees to generate new ideas. Furthermore, innovation management is measured that how the company can manage various innovative ideas. Digital technology is measured with the help of observing the policies as well as strategies of the company to implement new technology. In this way, the study observed the intention of business to adopt digital technology. Furthermore, this study measured sustainability with the help of economic sustainability, social sustainability and environmental sustainability. For economic sustainability, the current study considered various income generating activities for the welfare of people as well as development of economy. Social sustainability as considered in relation to the welfare of the people. Environment sustainability as considered by considering the effect of businesses on the environment and the use of latest technology to reduce the impact of business on environment.

Finally, this study distributed 500 questionnaires in Thailand. The population of the study is the floating market of Thailand. Therefore, these questionnaires are distributed among various businesses in Floating Market. The employees working in these businesses are allowed to fill the questionnaire after understanding the objective of the study. 225 questionnaires were returned from the survey. This study used simple random sampling to distribute the questionnaires among the respondents. Table 1 shows the data statistics.



**Table 1: Data Statistics**

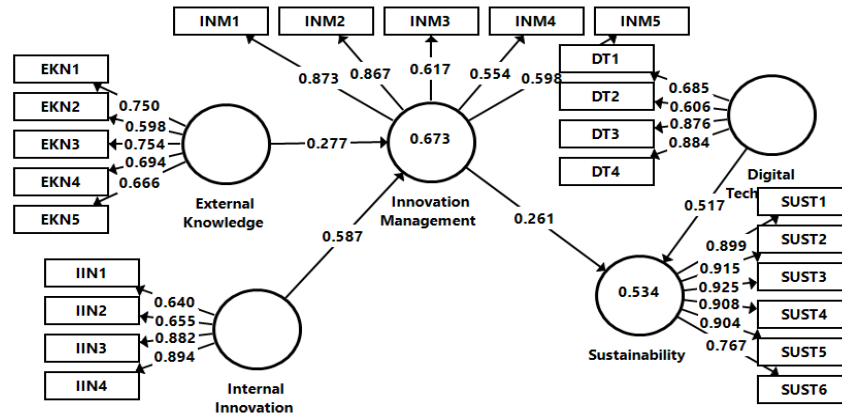
	No.	Missing	Mean	Median	Min	Max	SD	Kurtosis	Skewness
EKN1	1	0	3.948	4	1	5	0.991	0.536	-1.912
EKN2	2	0	2.987	4	1	5	2.129	-1.363	-0.611
EKN3	3	0	3.556	4	1	5	1.178	-0.598	-0.541
EKN4	4	0	3.011	4	1	5	2.983	1.458	-1.947
EKN5	5	0	4.116	4	1	5	0.854	1.133	-0.984
IIN1	6	0	3.84	4	1	5	2.072	-0.11	-0.772
IIN2	7	0	3.81	4	1	5	1.167	-1.391	-1.742
IIN3	8	0	2.912	4	1	5	2.152	-0.535	-0.556
IIN4	9	0	3.638	4	1	5	1.218	-0.574	-1.598
INM1	10	0	3.75	4	1	5	1.133	-1.351	-0.656
INM2	11	0	3.69	4	1	5	2.105	0.013	-0.698
INM3	12	0	3.925	4	1	5	0.886	1.368	-1.985
INM4	13	0	3.94	4	1	5	1.006	-0.413	-0.632
INM5	14	0	4.108	4	1	5	0.926	0.221	-0.841
DT1	15	0	3.925	4	1	5	0.943	-0.007	-0.682
DT2	16	0	3.948	4	1	5	0.987	0.765	-0.971
DT3	17	0	3.59	4	1	5	1.094	-0.321	-0.557
DT4	18	0	3.724	4	1	5	1.082	-0.129	-0.696
SUST1	19	0	3.593	4	1	5	1.271	-0.78	-0.507
SUST2	20	0	3.604	4	1	5	1.258	-0.964	-0.408
SUST3	21	0	3.772	4	1	5	1.164	-0.338	-0.704
SUST4	22	0	3.78	4	1	5	1.172	-0.713	-0.6
SUST5	23	0	3.795	4	1	5	1.212	-0.705	-0.624
SUST6	24	0	3.291	3	1	5	1.224	-0.899	-0.227

Note: EKN = External Knowledge, IIN = Internal Innovation, INM = Innovation Management, DT = Digital Technology, SUST = Sustainability

#### 4. Data Analysis

The current study employed most popular data analysis technique which is structural equation modeling (SEM). SEM is employed by using Smart PLS. In this analysis, the current study examined factor loadings which should be higher than 0.5. All the scale items are retained in this study because the factor loading is higher than 0.5 which is also shown in Table 2. Furthermore, composite reliability (CR) must be higher than 0.7 and average variance extracted (AVE) must be higher than 0.5 (Joe F Hair Jr, Howard, & Nitzl, 2020; Joseph F Hair Jr et al., 2021; Purwanto & Sudargini, 2021) to achieve convergent validity. All the values have achieved the minimum threshold level as shown in Table 2.

**Figure 2: Measurement Model**



Note: EKN = External Knowledge, IIN = Internal Innovation, INM = Innovation Management, DT = Digital Technology, SUST = Sustainability

**Table 2: Factor Loadings**

Variables	Items	Loadings	Alpha	CR	AVE
Digital Technology	DT1	0.685	0.771	0.852	0.596
	DT2	0.606			
	DT3	0.876			
	DT4	0.884			
External Knowledge	EKN1	0.75	0.735	0.823	0.501
	EKN2	0.598			
	EKN3	0.754			
	EKN4	0.694			
	EKN5	0.666			
Internal Innovation	IIN1	0.64	0.789	0.856	0.604
	IIN2	0.655			
	IIN3	0.882			
	IIN4	0.894			
Innovation Management	INM1	0.873	0.757	0.835	0.512
	INM2	0.867			
	INM3	0.617			
	INM4	0.554			
	INM5	0.598			
Sustainability	SUST1	0.899	0.946	0.957	0.789
	SUST2	0.915			
	SUST3	0.925			
	SUST4	0.908			
	SUST5	0.904			
	SUST6	0.767			

Note: EKN = External Knowledge, IIN = Internal Innovation, INM = Innovation Management, DT = Digital Technology, SUST = Sustainability



Discriminant validity is achieved by using AVE square root and cross-loadings. AVE square root is reported in Table 3 which shows the confirmation of discriminant validity. Furthermore, cross-loadings are given Table 4 which also used to confirm the discriminant validity. Thus, both the methods have confirmed the discriminant validity.

**Table 3: AVE Square Root**

	Digital Technology	External Knowledge	Innovation Management	Internal Innovation	Sustainability
Digital Technology	0.872				
External Knowledge	0.778	0.895			
Innovation Management	0.735	0.729	0.815		
Internal Innovation	0.701	0.769	0.801	0.877	
Sustainability	0.709	0.666	0.641	0.69	0.888

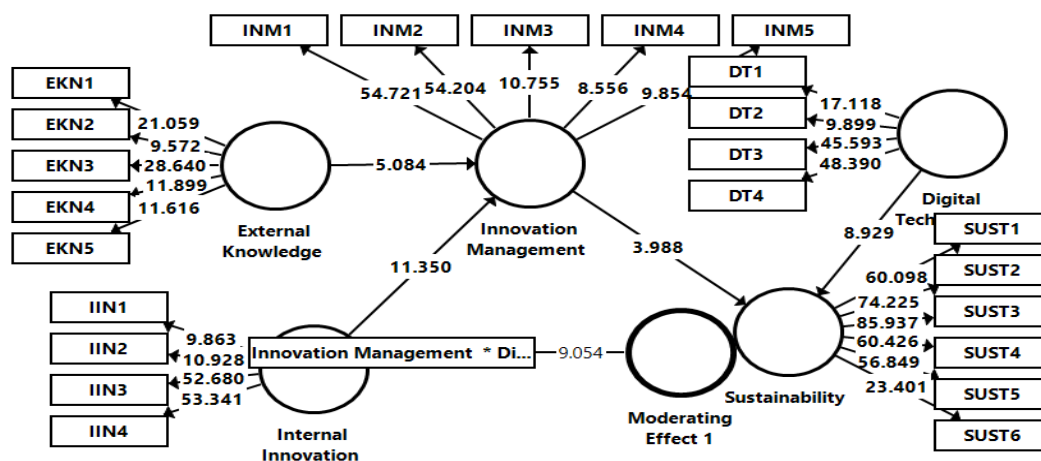
**Table 4: Cross-Loadings**

	Digital Technology	External Knowledge	Innovation Management	Internal Innovation	Sustainability
DT1	<b>0.885</b>	0.565	0.567	0.487	0.457
DT2	<b>0.806</b>	0.59	0.457	0.446	0.384
DT3	<b>0.876</b>	0.628	0.595	0.584	0.654
DT4	<b>0.884</b>	0.648	0.648	0.632	0.641
EKN1	0.564	<b>0.75</b>	0.511	0.487	0.427
EKN2	0.391	<b>0.598</b>	0.34	0.411	0.407
EKN3	0.652	<b>0.754</b>	0.687	0.692	0.695
EKN4	0.5	<b>0.694</b>	0.421	0.468	0.331
EKN5	0.534	<b>0.666</b>	0.471	0.396	0.353
IIN1	0.38	0.505	<b>0.819</b>	0.64	0.353
IIN2	0.439	0.522	<b>0.824</b>	0.655	0.375
IIN3	0.654	0.675	<b>0.864</b>	0.582	0.654
IIN4	0.638	0.675	<b>0.865</b>	0.694	0.663
INM1	0.648	0.617	0.673	<b>0.743</b>	0.617
INM2	0.589	0.646	0.667	<b>0.754</b>	0.584
INM3	0.475	0.478	0.617	<b>0.835</b>	0.326
INM4	0.391	0.396	0.554	<b>0.819</b>	0.331
INM5	0.51	0.426	0.598	<b>0.882</b>	0.328
SUST1	0.703	0.597	0.569	0.598	<b>0.899</b>
SUST2	0.666	0.592	0.558	0.629	<b>0.915</b>
SUST3	0.641	0.613	0.573	0.63	<b>0.925</b>
SUST4	0.627	0.622	0.599	0.66	<b>0.908</b>
SUST5	0.566	0.563	0.534	0.591	<b>0.904</b>
SUST6	0.556	0.555	0.581	0.562	<b>0.767</b>

Note: EKN = External Knowledge, IIN = Internal Innovation, INM = Innovation Management, DT = Digital Technology, SUST = Sustainability

Figure 3 presented the PLS structural model (Basco, Hair Jr, Ringle, & Sarstedt, 2021; Joe F Hair Jr et al., 2020) in which the relationship between external knowledge, internal innovation, innovation management, digital technology and sustainability is tested. In this process, the direct effect and moderation effect are considered. T-value 1.96 is observed to check the significance of the relationship. It is found that; external knowledge has positive influence to enhance innovation management with t-value 5.084. Furthermore, the relationship between internal innovation and innovation management is also positive with t-value 11.350. The relationship between innovation management with sustainability is positive and significant with t-value 8.929. Similarly, innovation management has positive effect on sustainability with t-value 3.988. Results are reported in Table 5.

**Figure 3: Structural Model**



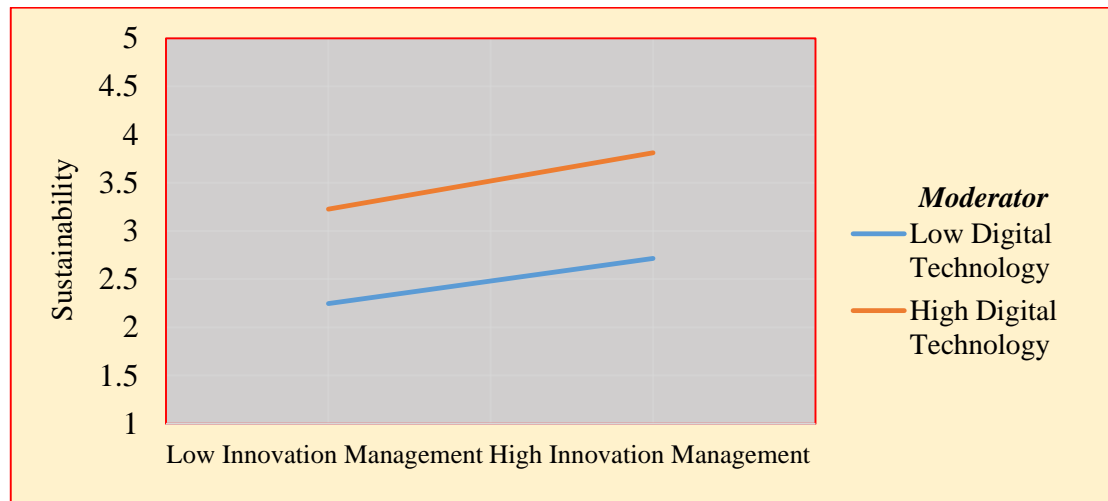
Note: EKN = External Knowledge, IIN = Internal Innovation, INM = Innovation Management, DT = Digital Technology, SUST = Sustainability

**Table 5: Direct Effect Results**

	Beta	(M)	SD	T Statistics	P Values
Digital Technology -> Sustainability	0.519	0.519	0.058	8.929	0
External Knowledge -> Innovation Management	0.277	0.276	0.055	5.084	0
Innovation Management -> Sustainability	0.263	0.264	0.066	3.988	0
Internal Innovation -> Innovation Management	0.587	0.59	0.052	11.35	0
Moderating Effect 1 -> Sustainability	0.029	0.002	0.014	2.01	0.039

Finally, the current study examined the moderation effect of digital technology between innovation management and sustainability. Moderation effect results are given in Table 5 which shows that moderation effect of digital technology between innovation management and sustainability is significant with t-value 2.01. This moderation effect is strengthening the relationship between innovation management and sustainability which is shown in Figure 4.

**Figure 4: The moderation effect of digital technology strengthening the relationship between innovation management and sustainability**



## 5. Conclusion

The results of the current study highlighted that sustainability can be achieved with the help of Floating Market of Thailand by promoting various elements such as innovation management and digital technology. It is proved that the integration between innovation and digital technology has the potential to enhance sustainability. It is concluded that innovation management has positive effect on economic sustainability. It is also observed that innovation management also has the potential to enhance social sustainability. The increase in environmental issues can also be managed with the help of innovation management. However, this study addressed that the promotion of innovation is also a difficult task. In this way, the current study proved that there are two important elements which can enhance the innovation management. Results show that external knowledge and internal knowledge has the potential to promote innovative activities among the businesses. Therefore, innovation management can be enhanced through external knowledge and internal innovation and lead to the sustainability. Finally, it is also proved that the interaction effect between digital technology and innovation management is also positive and significant. Directly, digital technology has the ability to enhance sustainability in terms of economic, social and environment. The implementation of digital technology in businesses among the Floating Market of Thailand can increase sustainability. Along with the direct effect of digital technology on sustainability, it is observed that digital technology as moderating variable can strength and the positive relationship between innovation management and sustainability. Therefore, the integration between digital technology and innovation management can enhance sustainability in Thailand.

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