# Influence of Innovation Capability Dynamic Capability and Organizational Climate toward Sustainability of Electroplating Factory in Thailand

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## **Abstract**

Thailand is moving towards the Thailand 4.0 era in which innovations serve as the main mechanisms. The electro plating industry, which is the main industry of the country, is an industry that creates quality and adds value for products which are important and necessary in the production process. Legal requirements and operational standards as well as technological developments and innovations in various fields have an effect on the electro plating process in terms of developing sustainability for the electro plating industry in Thailand. The objectives of this research were to: 1) study levels of innovation capability, dynamic capability, organizational climate, and sustainability of the electro plating industry in Thailand; 2) examine influences of innovation capability, dynamic capability, and organizational climate on the sustainability of the electro plating industry in Thailand; and 3) exhibit a model for sustainability development of the electro plating industry in Thailand. This research employed a mixed research methodology combining quantitative and qualitative methods. For the quantitative research part, the research sample consisted of 440 individuals who were top- and middle-level executives in the electro plating factories via a Structural Equation Modeling. They were selected via stratified sampling. As for the qualitative research component, in-depth interviews were conducted with 17 key informants consisting of specialists and academics in the electro plating industry. The findings showed that: 1) innovation capability, dynamic capability, organizational climate, and sustainability were rated at a high level; 2) innovation capability, dynamic capability, and organizational climate had an influence on the sustainability of the sustainability of the electro plating industry in Thailand, with a .05 level of statistical significance, and all of these factors could predict the results by 89 percent; and 3) the model of sustainability development of the electro plating industry in Thailand, developed by the researcher, was called the TSSS Model, consisting of T (referring to technology), S (referring to support), S (referring to strategic), and S (referring to sustainability). The main argument of this research is that technological innovations and organizational climate play a role in leading personnel to have dynamic capability in developing strategies for the electro plating industry in Thailand, creating a climate for the development of sustainable innovations, resulting in the electro plating industry in Thailand becoming economically, socially, and environmentally sustainable.

**Keywords:** Innovation capability, dynamic capability, organizational climate, sustainability, electroplating industry Thailand.

#### I. Introduction

Thailand is moving towards the industrial revolution 4.0 in which innovations serve as the main mechanisms (Oanh, Hanh, & Dung, 2021). The electroplating industry, which is the main industry of the country, is an industry that creates quality and adds value for products that

are important and necessary in the production process. Legal requirements and operational standards as well as technological developments and innovations in various fields have an effect on the electroplating process in terms of developing sustainability for the electroplating industry in Thailand. However, sustainability is one of the major issues in electroplating industry.

In the competitive environment, the role of sustainability among the organizations is most important (Shad, Lai, Fatt, Klemeš, & Bokhari, 2019). The low level of sustainability among the business activities has negative effect on the success of business. Therefore, sustainable business activity as well as the other activities related to the business has major importance for the organizations in such a competitive market. For every business activity it is important to achieve a significant level of sustainability which lead to the long-term benefits. On the other hand, low level sustainability led to the short-term benefits which has negative effect on the business and it causes to decrease the chances of survival in high competition. Sustainability is not only linked with a single element but it has several dimension in relation to the different businesses. For instance, economic sustainability for the business activities is a major element. The sustainable business activities to generate a stream of cash flows for a longer period of time is related to the economic sustainability. Furthermore, apart from economic sustainability which is linked with the profitability and it is the personal benefits of the company, the role of social sustainability is also important which is related to the communities. The company activities must have various social benefits and do not harm to the society. Additionally, the environmental sustainability is also linked with business activities (Cui, Weng, Nadeem, Rafique, & Shahzad, 2022) which has similar role in relation to the social as well as economic sustainability. With the increase in business globally, operations the environmental sustainability is decreasing. The pollution is increasing in the environment due to the increase in business activities. It leads to the decrease in environmental performance which has long term effects on the life of human living in a certain area(ÖZdemir, Kirli, IsClk, & Tapan, 2020; Seoane, 2020; Stopić, 2020; Usman & Rozar, 2020).

The electroplating companies working (Wangel, Mohamed, & Agamuthu, 2004) in Thailand has different issues related to the sustainability. These companies have significant importance for Thailand because it has reasonable contribution to the economy and it has

significant benefits for various other business activities in Thailand. However, these companies are suffering with the issues of sustainability. The performance of these companies is not sustainable due to the low contribution to economic. social environmental sustainability. Economically the performance of these companies is not stable and it is fluctuating which is one of the issues to achieve higher performance. Furthermore, these companies have low contribution to the society which lead to the lower social sustainability. Additionally, it led to the specific nature of these companies and their operations are harming to the environment. Therefore, it has negative effect on the environment which causes to decrease in overall environmental performance (Kobayashi & Farrington, 2020; Moskowitz & Dewaele, 2020; Schneider, 2020; Sethuraman & Radhakrishnan, 2020).

However, the issues related to the sustainability among electroplating companies can be managed with the help of innovation capability. The innovation always plays a central role to resolve various issues related to the economic. social and environment. The innovative ideas among the companies can lead to increase the financial performance of the company which can manage the economic sustainability. The innovative ideas may also have several benefits for the stakeholders as well as society which can play important role to the social welfare. Innovation among these organizations can promote organizational climate as well as dynamic capabilities (Jonah & Kanyangale, 2021; Muller, 2020; Niyimbanira, Eggink, & Nishimwe-Niyimbanira, 2020; Ozer & Akbas, 2020; Payne & Hadzhidimova, 2020). Any change in the business market is always required to adopt by the companies which is linked with dynamic capabilities. In this innovative capability can promote dynamic capabilities as well as to promote organizational climate. The promotion of dynamic capabilities and organizational climate has the potential to promote sustainability. Therefore, this study is an attempt to examine the role of innovation capability in sustainability of electroplating companies in Thailand. Therefore, this study examined the relationship between innovation capability, dynamic capability, organizational climate and sustainability which is less addressed by previous studies. As number of studies considered innovative capability, dynamic capability, organizational climate and sustainability (Amui, Jabbour, de Sousa Jabbour, & Kannan, 2017; Song, Wang, & Ma, 2020), however, these studies have not considered the electroplating factories of Thailand which is one of the major contribution of the study. The literature completely ignored the economic sustainability, social sustainability and environmental sustainability in relation to the electroplating factories in Thailand. The specific objectives of this research include; 1) to study levels of innovation capability, dynamic capability, organizational climate, sustainability of the electroplating industry in Thailand; 2) to examine influences of innovation dynamic capability, capability, organizational climate on the sustainability of the electroplating industry in Thailand; and 3) exhibit a model for sustainable development for the electroplating industry in Thailand.

#### 2. Literature Review

## 2.1 Sustainability (SUS)

Sustainability means meeting needs without compromising the ability of future generations to meet their own needs. However, meeting the only needs without affecting the future generations is one of the major challenges among the nations. Therefore, sustainability is one of the major issues globally which need various strategies. According to the current study, sustainability is majorly based on three elements. These elements include economic sustainability, social sustainability and environmental sustainability. Economic sustainability is based on the economic activities' availability in any society or any Nation. The sustainability in economic activities is most important for the welfare of the people as well as nation. In any area the opportunity to generate income for people such as business opportunities is most important. Although every area has its own opportunities for business, however sustainability in economic activities is not easy to achieve (Layachi, 2021; Ngwenya & Nkosi, 2021; Philbin & Kaur, 2020; Romulo B. Magnaye, 2020; Salavrakos, 2020). Short term economic activities do not lead to the sustainability; therefore, it is important to generate economic activities for long term basis. Along with the economic sustainability, social sustainability is also most important (Govindan,

Shaw, & Majumdar, 2021). Social sustainability is based on the creation of sustainable places that promote wellbeing in the society with the help of understanding the requirements of the people living in a specific area. Along with the economic activities in any area the social activities which are also most important which required sustainability. In addition to the economic sustainability and social sustainability, environmental sustainability is another important part of sustainability. In the current era of industrialization, the business activities are continuously damaging the environment. The pollution in the environment is increasing day by day which has negative effect on human life. The sustainability in environment is at lower level in most of the countries due to the polluted environment. Therefore, it is needed to ensure environmental sustainability by decreasing the level of pollution in the environment. Hence, the current study is important to promote sustainability, economic, social and environmental sustainability.

## 2.2 Innovation Capability (IC)

Innovation capability can be explained as a firm's capability to classify new ideas (Zhang, Yang, Yang, & Gao, 2022) and transform them into new enhanced products, services or procedures. The current research also calls for an improved understanding of the link between strategy and innovation. Innovation is the need of today's competitive business environment. The innovation in products as well as services is most important to achieve higher level of success in business activities. Therefore, the availability of Innovation capability among organizations is most important to generate valuable ideas which may lead to the importance of products as well as services. According to the current study, innovative capability is based on the product innovation. The products making by the companies require innovative elements which may attract the customers and provide better benefits to the customers. All the manufacturing companies require innovation in products to promote product manufacturing. Furthermore, the process innovation also has most significant role in innovative capabilities. To achieve a higher level in innovative capability, it is needed to promote process innovation. As in manufacturing companies, the product manufacturing is based on several processes and all the processes are equally important to create a good product. The weakness in any process may lead to decrease the quality of the product. Therefore, along with the product innovation, the innovation in process has significant role. Furthermore, the role of various administrative tasks manufacturing of any product is also most important. The administration in any business organization can play a significant role to promote innovation on an efficient way. The management of activities in organizations require innovative ideas in administrative. Finally, the innovative capability is also based on technological innovation. The technological innovation is based on the innovation of manufacturing a product with latest technology having significant benefits related to the efficient product quality and at a minimum cost. Therefore, innovative capability promoted through innovation in product, process, administration as well as Technology. According to the current study, sustainability is influenced by the innovative capability. The innovative capability among the organizations can promote sustainability. For example, the innovation in various business activities can generate economic opportunities. generation of economic activities in any area lead the economic sustainability. to Furthermore, innovative capability also led to environmental as well as social sustainability. The innovation in product process as well as technology can be less harmed to the environment (Haitao, 2020; Krysiński & Szczepański. 2020). The traditional manufacturing may lead to the environmental pollution; however, the innovation may lead to the lower level of effects on environment which can promote environmental sustainability. Previous studies also have evidences that innovative capabilities of the organizations have significant role to promote sustainability (Munir, Arief, Abdinagoro, & Furinto, 2022). Therefore, it is hypothesized that;

**Hypothesis 1.** Innovation capability has positive effect on sustainability.

## 2.3 Dynamic Capability (DC)

Dynamic capabilities are defined as "the firm's capability to integrate, build, and reconfigure internal as well as external capabilities to

address quickly changing environments". Dynamic capabilities are based on the ability of any company to adapt various changes according to the environment. Business market is always a rapidly changing market which requires the companies to adopt all the changes to get success in the market (Imran, Salisu, Aslam, Iqbal, & Hameed, 2019). With the increase in competition the business market is more dynamic which has significant effect on the companies. Therefore, dynamic capabilities effect on the competencies of the firm. Dynamic capabilities include the adaptive capabilities of the companies. It also includes the capabilities of the management. The management of the company must have significant level of capability to produce significant outcomes. Furthermore, adjustments are always required to promote various products as well as services in changing business market. The capabilities of the company to make various strategies is also important. Therefore, dynamic capabilities involve adaptive capabilities, management capability as well as strategic capabilities. These capabilities have significant relationship with sustainability. As highlighted by previous studies that organizational capabilities has significant relationship with sustainability (Annunziata, Pucci, Frey, & Zanni, 2018). Literature identified that there is a strong correlation between the capabilities of the company and the level of sustainability. Hence, it is hypothesized that;

**Hypothesis 2.** Innovation capability has positive effect on dynamic capability.

# 2.4 Organizational Climate (OC)

Organizational climate is an indicator for judging the employee sentiment about their employers' policies as well as practices. Along with the organizational capability, the climate of the organization also can play a significant role. Organizational climate has significant effect on the activities of the organization (Adamska, Kosakowska-Berezecka, Jurek, & Konarski, 2022). Generally, it is based on the policies as well as practices of any organization towards their employees as well as various other activities. The policies and practices of the company towards employees' effect on the employee performance which has significant effect on overall company. According to the current study, organizational climate is based on the structure of the organization. Organizational

structure is linked with the employees and shows flow how Information from management to lower management. It is also based on the responsibilities of the organization as well as employees of the company. Additionally, it is also based on the mechanism of rewards, compensation, various standards and various strategies. All these elements of organizational climate have a significant effect on the level of organizational sustainability. In line with this study, literature also demonstrates that organizational climate has significant connection with sustainability (Phua, 2018). Various authors claim that the climate of the organization has effect on the level of sustainability. Therefore, by reviewing the literature, it is proposed that organizational climate effect sustainability. has on Additionally, it is also observed in the literature that innovative capability is also has the effect on dynamic capabilities. Innovation among the organizations can lead to the adaptation of environmental changes. Higher the innovative capability of the organization higher the level of acceptance of changes in the environment by the organization. Furthermore, innovative capability of the organization also has significant effect on organizational capability. Higher the innovative capability better will be the organizational climate. As approved by the literature that innovation has effect on dynamic capabilities as well as organizational capabilities (Mikalef, Boura, Lekakos, & Krogstie, 2019). Therefore, following hypotheses are proposed;

**Hypothesis 3.** Innovation capability has positive effect on organizational climate.

**Hypothesis 4.** Organizational climate has positive effect on dynamic capability.

**Hypothesis 5.** Dynamic capability has positive effect on sustainability.

**Hypothesis 6.** Organizational climate has positive effect on sustainability.

# 3. Methodology

### 3.1 Research Design

This study addressed the relationship between sustainability, innovation capability, dynamic capability and organizational climate. The nature of this relationship is supported both for the quantitative research and qualitative research. Literature addressed these variables through quantitative research and qualitative research. Therefore, this relationship can be measured through mixed method approach. Hence, this study used mixed method approach. The combination of quantitative research and qualitative research is most suitable to get results (Boamah, 2022). The cross-sectional research designed is sued for data collection.

## 3.2 Questionnaire Design

The questionnaire is developed by following the previous studies. The scale items revealed by previous studies were adopted to design a questionnaire. Ouestionnaire was designed on 5point Likert scale. Fist section of the questionnaire collected the general information of respondents and second section of the questionnaire collected the information of key study variables, namely; sustainability, innovation capability, dynamic capability and organizational climate, through scale items. Sustainability is measured by using measures related to economic sustainability, social sustainability and environmental sustainability. Furthermore, innovation capability is measured through product innovation, administrative innovation. process innovation technological innovation. Dynamic capability is measured by using adaptive capability, management capability, absorptive capability and strategic capability. Finally, organizational climate is measured through scale items related to the organizational structure, responsibility, warmth, support, reward, standard and identity.

#### 3.3 Data Collection

The population of the study is electroplating factories working in Thailand. The top and middle level executives were considered as the respondents of the study. The research sample consisted of 800 individuals who were top and middle-level executives in the electroplating factories. They were selected via stratified sampling. Therefore, questionnaires were distributed among the electroplating factories of using stratified sampling. Thailand by Furthermore, for the qualitative research, indepth interviews were conducted from 17 executives, specialists and academics in the electroplating industry. From total distributed questionnaires. 440 respondents responded.

## 4. Data Analysis and Results

Before to assess the relationship between variables, this study carried out initial data screening. It is important because initial data screening is important to remove the errors in the data (Ashara & Mustaffa, 2019), otherwise it

may effect the results. In data screening, this study removed the missing value as well as outlier in the data. Finally, after data screening, data statistics are given in Table 1.

**Table 1.** Statistical test of empirical variables (n=440)

Variable	$\overline{X}$	S.D.	%CV	Sk	Ku	$\chi^2$	P-value
PDTI	3.89	.79	20.31	830	-1.900	4.298	.117
PCI	3.99	.56	14.04	217	384	.194	.907
ADI	4.05	.61	15.06	444	664	.637	.727
TCHI	3.83	.72	18.80	507	961	1.181	.554
ADC	4.03	.61	15.14	460	696	.696	.706
MNC	3.88	.71	18.30	569	925	1.179	.555
ABC	3.92	.68	17.35	580	-1.114	1.578	.454
STC	3.93	.67	17.05	462	715	.726	.696
OS	3.98	.63	15.83	508	935	1.132	.568
RES	4.19	.55	13.13	600	824	1.039	.595
WAR	4.08	.63	15.44	718	-1.289	2.177	.337
SUP	3.86	.73	18.91	446	702	.692	.708
REW	3.74	.85	22.73	673	-1.239	1.988	.370
STD	4.23	.59	13.95	851	-1.619	3.347	.188
ID	3.94	.66	16.75	437	741	.740	.691
ECS	4.11	.57	13.87	473	789	.846	.655
SOS	3.98	.66	16.58	739	-1.543	2.926	.232
ENS	4.20	.65	15.48	-1.278	-1.903	5.255	.072

There are several statistical techniques available to examine the relationship. The most suitable and widely used data analysis technique is structural equation modeling (SEM) (Hair, Hult, Ringle, Sarstedt, & Thiele, 2017; Khan et al., 2019) which is employed by the current study. This technique started with factor analysis to check the factor loadings. This study retained all the scale items with factor loadings above 0.7. The scale items given in Table 2 shows that the factor loadings are above 0.7. Additionally, this

study also examined the composite reliability (CR) which is above 0.7 for sustainability, innovation capability, dynamic capability and organizational climate. Furthermore, this study examined discriminant validity (Purwanto & Sudargini, 2021) by using  $HTMT_{0.9}$  criteria.

**Table 2.** Factor Loadings. (n = 440)

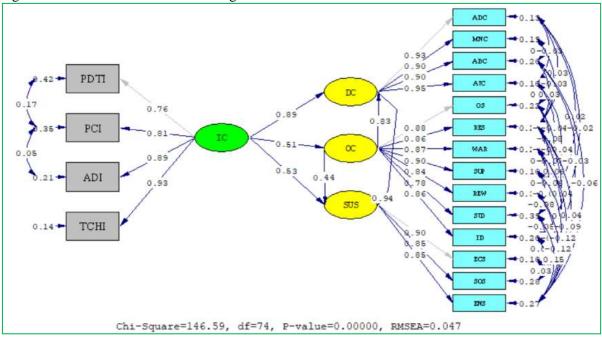
	Factor	Error			
Variable	Loading $(\lambda)$	(θ)	t	$\mathbb{R}^2$	
1. Innovation Capability (IC)					
1.1 Product Innovation (PDTI)	.76	.42	-	.58	
1.2 Process Innovation (PCI)	.81	.35	24.48	.65	
1.3 Administrative Innovation (ADI)	.89	.21	20.85	.79	
1.4 Technological Innovation (TCHI)	.93	.14	22.01	.86	
$\rho_c = .91 \ \rho_v = .72$					
2. Dynamic Capability (DC)					
2.1 Adaptive Capability) (ADC)	.93	.13	-	.87	
2.2 Management Capability (MNC)	.90	.19	33.08	.81	
2.3 Absorptive Capability (ABC)	.90	.20	32.32	.80	
2.4 Strategic Capability (STC)	.95	.10	36.25	.90	
$\rho_{c}$ = .96 $\rho_{v}$ = .84					
3. Organizational Climate (OC)					
3.1 Organizational Structure (OS)	.88	.22	-	.78	
3.2 Responsibility (RES)	.86	.26	25.23	.74	
3.3 Warmth (WAR)	.87	.25	23.05	.75	
3.4 Support (SUP)	.90	.19	23.51	.81	
3.5 Reward (REW)	.84	.30	20.95	.70	
3.6 Standard (STD)	.78	.39	20.74	.61	
3.7 Identity (ID)	.86	.26	25.27	.74	
$\rho_c = .95 \ \rho_v = .73$					
4. Sustainability (SUS)					
4.1 Economic Sustainability (ECS)	.90	.19	-	.81	
4.2 Social Sustainability (SOS)	.85	.28	27.51	.72	
4.3 Environmental Sustainability (ENS)	.85	.27	24.07	.73	
$\rho_c = .90, \ \rho_v = .75$					

This study addressed the relationship through structural model by using SEM which most reliable to check the relationship among variables (Chairatana, 2021; Hair et al., 2017;

Hair et al., 2019; Khan et al., 2019). In this process, the effect of innovative capability is examined on dynamic capability. The positive effect of innovative capability is found on

adynamic capability. Innovation capability also has significant effect on organizational capability. Furthermore, significant relationship is found between innovation capability and sustainability. Therefore, innovation capability has significant effect on dynamic capability, organizational climate and sustainability. Finally, both the dynamic capability and organizational climate also has significant

relationship with sustainability. Furthermore, all the indirect effects are also supported. The r-square value of sustainability is 0.89 which shows that, innovation capability, dynamic capability and organizational climate is expected to bring 89% change in sustainability. All these results are given in Table 3 and SEM process is given in Figure 1.



**Figure 1.** Framework of the study highlighted the relationship between sustainability, innovation capability, dynamic capability and organizational climate.

**Table 3.** Parameter estimation result of direct effect coefficient, indirect effect, and total effect from adjusting model (n=440)

		Effect	Independent Variable			
Dependent Variable	$\mathbb{R}^2$		Dynamic Capability (DC)	Organizatio nal Climate (OC)	Innovation Capability (IC)	
		DE	-	.83	.89	
Dynamic Capability (DC)	.94	IE	-	-	-	
		TE	-	.83	.89	
	.89	DE	-	-	.51	
Organizational Climate (OC)		IE	-	-	.33	
(00)		TE	-	-	.84	
	.89	DE	.94	.44	.53	
Sustainability (SUS)		IE	-	.46	.34	
		TE	.94	.90	.87	

 $\chi^2$ = 146.59 df = 74 p-value = .00000,  $\chi^2$  / df = 1.98, RMSEA = .047, RMR = .010, SRMR = .020, CFI = 1.00, GFI = .96, AGFI = .92, CN = 298.56

#### 5. Discussion and Conclusion

The results of the study are obtained by testing various direct and indirect effect. The direct and in-direct effect are examined after collecting data from the respondents. The results of hypotheses shows that innovative capability has importance electroplating among organizations. It is found that innovative capability has positive effect on sustainability. It indicates that increased capability in relation to the innovation among the organizations can increase the sustainability. The results indicated that innovation can lead to the economic sustainability. Furthermore. capability can enhance the social sustainability as well as environmental sustainability. These results are in line with the previous studies because previous studies also shows the positive relationship between innovation sustainability (Pedersen, Gwozdz, & Hvass. 2018; Stubbs, 2019). Innovative capability has significant positive effect on capability. Various changes in the business market can be adopted with the help of innovation capability. The organizations having better level of innovation capability can easily handle market changes and adopt according to the need. Nevertheless, it is found that innovation capability has positive effect on organizational climate. Therefore, increase in innovation capability can increase organizational climate in a positive way. Organizational climate has the ability to enhance sustainability of the organization. Better structure can increase organization sustainability such as economic, social and environmental sustainability. Similarly, it is evident that dynamic capability of organizations can have positive effect on sustainability. It shows that the capability of the organizations to adopt changes in the market can lead to increase the sustainable economic activities, sustainable social activities environmental and sustainability.

The main argument of this research is that technological innovations and organizational climate play a role in leading personnel to have the dynamic capability in developing strategies for the electroplating industry in Thailand. Furthermore, creating a climate for the development of sustainable innovations. resulting in the electroplating industry in Thailand becoming economically, socially, and environmentally sustainable. The findings showed that; innovation capability, dynamic capability, organizational climate, sustainability has major importance for electroplating industry Thailand. in Furthermore, innovation capability, dynamic capability, and organizational climate has influence on the sustainability electroplating industry in Thailand. The model of sustainable development of the electroplating industry in Thailand, developed by the researcher, was called the TSSS Model, consisting of T (referring to technology), S (referring to support), S (referring to strategic), and S (referring to sustainability).

## 6. Implications of the Study

The current study has contribution to the literature because this study examined the relationship between sustainability, innovation capability dynamic capability, organizational climate which is unique and rarely addressed by the previous studies. Although, sustainability and innovation are addressed in several times by several studies, however, this relationship is not examined among the electroplating companies Thailand. The effect of innovation capability on dynamic capability, organizational climate and sustainability is first time examined by the current study among electroplating companies of Thailand. Thus, this study has major theoretical implications. Additionally, these implications lead to the practical implications. Results shows important insights for the management of electroplating companies to Practitioners promote sustainability. enhance social, economic and environmental sustainability by promoting innovation capabilities.

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