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Antecedents and level of success in the development of new products of the community enterprises in Nonthaburi Province

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Abstract---The development of local products to meet with the quality standards can respond to the needs of consumers. However, the new product development (NPD) is one of the major challenges. The rate of success in NPD is low which is a hurdle to promote local products. In this way, this study is an attempt to highlight various factors influencing NPD. For this purpose, the current study considered quantitative research method and qualitative research method. Thus, a mix method approach is used in which the data collection is made through questionnaire and interviews. For the quantitative research part, the research sample consisted of 740 members of community enterprise groups in Nonthaburi province, Thailand. For qualitative research, in-depth interviews were carried out. Results of the study highlighted that; co-creation, speed for entering the market, innovation, process, new product development teams, marketing strategies, technology, leadership and government support has positive role in NPD. Results of the study contributed significantly to the literature as well as practice.

Keywords---new product development, co-creation, innovation, marketing strategies, technology, leadership, government support.

Introduction

Small and micro enterprises are those enterprises which are operating by the local communities at small scale. These micro enterprises are based on small business activities to generate income. In various communities, the small and micro enterprises has significant role to produce various goods as well as a services (Edelia & Aslami, 2022). The production of goods and distribution of various services has important role to generate income and welfare of the people. These activities have important role in economic development of a specific area and it also has contribution to the economic development of any country. Similarly, these small and micro enterprises business operations are also most important in Thailand. In various local communities of Thailand, these enterprises are the way to generate income and increase the level of wellbeing. The contribution of these enterprises in overall business industry cannot be neglected.

These enterprises are involved in development of different products at local level (Ezennia & Mutambara, 2021). However, the success rate of these products at local level is below the satisfactory level. The low level of success in new product development discourages the people to start these business enterprises. The failure rate of these enterprises leads towards the decrease in economic development of various areas in Thailand. Although the literature addressed that these enterprises in Thailand has major importance for the community, however, the success rate of these enterprises is needed to consider by the researchers as well as practitioners. In Thailand, these enterprises are facing several issues which causes to influence the overall success of new product development (NPD). For instance, the micro enterprises in Nonthaburi province of Thailand are facing the issue of co-creation activities. The interaction of these small and micro enterprises with the stakeholders such as suppliers as well as consumers is quite low. Furthermore, these enterprises are also facing the issue to fulfill the requirement of the market. Because the manufacturing process of these micro enterprises has not sufficient potential to meet the market requirement. Additionally, innovation is one of the important elements (Haryati, Yasri, Aimon, & Darwin, 2021), however, the small scale businesses are unable to implement innovative ideas due to the lack of resources. Furthermore, various other issues included; marketing problems, technology implementation, leadership, government support and innovative process of product development. These issues are the major hurdles for the small and micro enterprises in Nonthaburi province to promote NPD.

In this way the current study is an attempt to identify different factors which may influence the process of NPD of small and micro enterprises in Nonthaburi province of Thailand. The identification of these factors may lead to the success of new product with the help of managing various problems. Therefore, the specific objectives of the current study are follows; 1) to study the levels of the antecedents including co-creation, speed for entering the market, innovation, process, new product development teams, marketing strategies, technology, leadership and government support and success in the new product development of the community enterprises in Nonthaburi Province; 2) to examine influence of factors including co-creation, speed for entering the market, innovation, process, new

product development teams, marketing strategies, technology, leadership and government support on the NPD success of the community enterprises in Nonthaburi Province; and 3) to develop a model for the success in the new product development of the community enterprises in Nonthaburi Province, Thailand.

The success of new, distinctive, and creative products as well as the creation of value and meaning for the products of community enterprises are the main focuses of customers when making purchase decision. Local products derived from the local wisdom generally attract consumers' attention. At present, entrepreneurs still lack an ability in the development of new products for generating marketing efforts. In this way, aforementioned objectives of the current study have major importance for the literature of NPD as well as practitioners. Because these objectives are not considered by any previous study. Although previous studies identified various elements affecting on NPD (Marion & Fixson, 2021; Tsang et al., 2022; Yan et al., 2020), however, small and micro enterprises in Nonthaburi province of Thailand is not highlighted. Additionally, this study proposed a model for NPD in Nonthaburi province which has unique contributions.

Literature Review

New Product Development (NPD)

NPD is the procedure of bringing a new product to the marketplace. Business may require to involve in this procedure due to changes in consumer preferences, increasing competition and enhance in technology or to capitalize on a new business opportunity. In any business activity, the role of NPD is most important which has vital importance to increase the level of success in the market. Organizations always focuses to promote NPD because it has major importance in the market (Ciric, Lalic, Gracanin, Palcic, & Zivlak, 2018). Similarly, the NPD community micro enterprises also have major importance. The success of micro enterprises is majorly dependent on NPD. The current study is focusing on the NPD of micro enterprises in Nonthaburi province of Thailand. NPD is considered in Thailand by different studies (Bilgram, Brem, & Voigt, 2008), but it is not addressed in relation to the Nonthaburi province.

Co-Creation

Co-creation, in the context of a business, denotes to a product or service design procedure in which input from consumers plays a central role from beginning to end. Less specifically, co-creation is also used for any way in which a business permits consumers to provide ideas, designs or content. The environment of external stakeholders is most important in any business activity. The external stakeholders always provide valuable ideas to increase the business performance. Because the external stakeholders in form of customers, suppliers as well as external partners along with any other entity which is influence by the business activities of the company are the sources of ideas. These suppliers of the company have continuous communication with the consumers and consumer highlight various strengths of the products as well as weaknesses of the products. In this way, supplier provide the information to the company for the improvement in

products as well as services. Most importantly, suppliers provide various ideas to the companies which are helpful to produce customized products. Previous studies also highlighted that co-creation activities have central importance in business process (Tuan, Rajendran, Rowley, & Khai, 2019; Zhang, Gupta, Sun, & Zou, 2020). It also has major role in NPD. Similarly, the external stakeholders are external partners in collaboration with a supplier as well as customers also helpful to produce better new products in line with the desires of the customers. Therefore, co-creation activities have important influence on NPD which allow the current study to hypothesized that;

Hypothesis 1. Co-creation has positive influence on NPD.

Speed for Entering the Market

In highly competitive market, the speed of product development is most important (González-Zapatero, González-Benito, & Lannelongue, 2019). The entry of new product in the market at the suitable time is most important. Because in the market several businesses trying to introduce new products in the market, therefore, the timely introduction of new products in the market is important. To capture market share, the timely entry of new product in the business market has influential road. The companies who do not manage to introduce new product in the market at require time could not gain a sufficient share of the market. Therefore, the micro enterprises working in the market must have sufficient resources to full fill the need of market in relation to the new products. It shows that the speed of the business operations to enter new products in the market is most important. It is hypothesized that;

Hypothesis 2. Speed has positive influence on NPD.

Innovation

Innovation has central importance in any business activity because the innovation is one of the ways to produce goods and services with increased quality and less time and at low cost. Therefore, innovation led to the efficiency in the product development process with low cost which is helpful to decide the overall price of the product. The innovative features in the products remain the intention of the customers (Suceveanu, Grosu, Alexa, & Fînaru, 2020) because in the current era of industrialization, the customers always required innovative features in the products and services (Hameed, Nisar, & Wu, 2021). Innovation is an idea which added the value to new products. Literature supported the argument that innovation is key to the success in NPD. In the current study, in competitive environment to get success in NPD, the environment of innovation is one of the necessary elements which is also investigated by previous studies (Fernandes et al., 2018). However, the concept of innovation in local community for product development is at initial stage. Therefore, the local community in product development process, the innovation must be included which has effect on the success rate. Therefore, this study hypothesized that;

Hypothesis 3. Innovation has positive influence on NPD.

Process for Product Development

In business activities, the process of business operations has most important role in the success of business (Svensson & Wagner, 2011). Most importantly, the process of any product development has influence on the finished products. The implementation of smooth process in product development has influence in supply chain process as well as finished goods. Generally, in the new age of technology development, the businesses are trying to implement new technology in the process. The introduction of new technology in the process of product manufacturing help them to decrease the overall cost. It also helps them to reduce the overall time of product manufacturing. Most importantly it helps the organization to produce customized products. Therefore, these initiative and product development process help the organization to get success in new product in the highly compatible business market. Therefore, the process is most important which is based on innovation as well as new technology to manufacture a new product. In the community enterprises, the innovative process is lacking for the development of products and services. Previous study is also highlighted that innovative processes in NPD is most important (Amaya, Wu, & Liao, 2021). From the offer mentioned discussion, they study hypothesized that

Hypothesis 4. Process has positive influence on NPD.

New Product Development (NPD) Teams

The human resources are the most significant element in NPD (Han, Kang, Oh, Kehoe, & Lepak, 2019; Takuma & Iwakami, 2019). The success of any product majorly based on human resources. The skilled human workers are always required to perform better NPD process. Therefore, NPD team has major importance to lead a new product two for the success and capture the market share. The team work between the employees is also more significant part and effective corporation lead to the innovative ideas. Most importantly the knowledge as well as expertise of employees working on various products of NPD is most important to achieve success. The skillful employees always added technologically innovative elements in the products which is the demand of current comparative market. Furthermore, the skillful employees in an organization lead to competitive advantage which causes to get success in NPD.

Hypothesis 5. NPD team has positive influence on NPD.

Marketing Strategies

Marketing is the key to success in any product and services. It is considered as one of the important tools to promote various products of the company. It is based on various tactics to popularize the new products as well as old products. The marketing tool help to increase the level of awareness among the journal public related to the specific products as well as the features of the products. Generally, new products remain hidden from the general public until the company do not advertise the new products through various channels. Therefore, marketing strategies are most important for a company to introduce a new product (Choe, Kim, & Hwang, 2021). The advertisement of the new products

helps and the effective marketing strategies has the potential to enhance the level of success and to capture the higher market share in a competitive business market. In highly comparative market, business successful having affective marketing strategies implementation is important. Similarly, NPD also require effective marketing strategies to get success in the market;

Hypothesis 6. Marketing strategy has positive influence on NPD.

Technology

In the current area of industrialization, the Industry 4.0 can play most influential role (Raj, Dwivedi, Sharma, de Sousa Jabbour, & Rajak, 2020). The introduction of Industry 4.0 in the current era the businesses are working more effectively than previous decade. Because the introduction of new technology helps the companies to faster the overall product manufacturing process. The introduction of new technology such as big data help the company to foster business operations because it provides the innovative elements which causes to decrease overall cost and increase the level of efficiency. The implementation of new technology is one of the major problems among the companies (Black, Carlile, & Repenning, 2004), particularly, in the small businesses the implementation of new technology is one of the big challenges. Because it is one of the costly processes and all businesses cannot afford to implement new technology which is one of the hurdles in NPD. Previous studies mentioned that the role of Industry 4.0 is new technology implementation in NPD has most crucial role. Hence, it is proposed that;

Hypothesis 7. Technology has positive influence on NPD.

Leadership

Along with the all-other important elements which has influence on NPD process, the role of leadership is most important (Tai, Chang, Hong, & Chen, 2012). In all business organizations the effectiveness of leadership can play most important role to lead in various matters of the company. The leadership role of managers as well as management has major influence on the employees which causes to decrease or increase in the performance of manufacturing. Leadership to supervise the subordinate and effective way to supervise the sub ordinances help them to achieve various objectives. Several important elements among the organizations such as innovation as well as implementation of new ideas are also influenced by the good leadership skills. Skills of manager also generate a competitive advantage in the organization (Akram, Goraya, Malik, & Aljarallah, 2018). The leadership has role in the organizations to promote NPD. It has major importance for the employee's behavior because it helps to generate a positive behavior which lead to the product success; however, it may also increase the negative behavior of the employees due to inappropriate leadership style which ultimately has effect on product development process. Generally, leadership is based on the transformer leadership and transactional leadership which has influence among the organizations. Similar with the current study, different studies in the literature also mention that leadership style has influential role in NPD. Therefore, it is hypothesized that;

Hypothesis 8. Leadership has positive influence on NPD.

Government Support

Business organizations are also influenced by the government bodies. As government of any country also has role in the business activities and it is one of the major stakeholders of companies. Because government of any country developed various roles and regulations for the business operations. Various laws limit the business operations and do not allow to cross the defined limit by the government bodies. Therefore, all the laws regulated by the government are important to follow by the business organizations (Жураев, 2021). It has influence on the business activities such as the development of new products. For instance, the government bodies have various regulations related to the environmental protection. In this way, the business organizations cannot adopt such process which has negative effect on the environmental health. Business organizations also needed to follow various business operations as well as various activities which can help to improve the environmental performance. Similarly, the government bodies may also define various other rules and regulations in relation to the sale and purchase of products as well as marketing activities. It is also very common that government organizations support various product development, for example, in the local community the government of Thailand is promoting local product development. Because the product development among various communities generates the income for the people which lead towards the welfare of the society. It is also observed that government of Thailand promoting different initiative related to provide the funding as well as initial capital to the businesses working in local community. These types of initiatives by the government have role to enhance the NPD. Thus, it is hypothesized that;

Hypothesis 9. Government support has positive influence on NPD.

Methodology

The most popular research methodologies include; quantitative and qualitative methods. The current study employed both the quantitative and qualitative methods. Therefore, the current study employed mixed research method. While considering the quantitative research approach, this study employed cross-sectional research design. A questionnaire is developed for data collection. Therefore, quantitative part of this study is managed by conducting a questionnaire survey. 740 members of community enterprise groups in Nonthaburi Province, Thailand is considered as the sample of the current study. This study selected sample size by considering the 20 times the observed variables. Respondents were selected via multi-stage sampling (Ma, Rosenberg, & Kaizer, 2021). Data were collected with the use of a questionnaire and analyzed with a structural equation model (SEM). As for the qualitative research part, in-depth interviews were conducted with 30 key informants who were community enterprise leaders in Nonthaburi province, Thailand.

Data Analysis

The current study employed structural equation model (SEM), a most popular and recommended data analysis technique used by several previous studies (Rahi & Abd Ghani, 2018). The statistical test of empirical variables is given in Table 1. It shows the normality of the data, standard deviation and p-value. Data statistics shows that the collected data is accurate to proceed for further analysis through structural equation model (SEM).

Table 1. Statistical test of empirical variables (n=740)

Variable	\bar{X}	S.D.	%CV	Sk	Ku	χ^2	P-value
Realiz	3.56	.98	27.53	-1.576	-2.543	8.950	.011
Intell	3.65	.94	25.75	-1.762	-2.688	1.331	.006
Partic	3.46	1.03	29.77	-1.421	-3.087	11.550	.003
Respon	3.38	1.07	31.66	-1.149	-3.329	12.405	.002
Time	3.24	1.15	35.49	-.743	-4.078	17.184	.000
Identi	3.44	.94	27.33	-.947	-1.833	4.258	.119
Access	3.56	.91	25.56	-1.340	-1.921	5.484	.064
Synthe	3.49	.97	27.79	-1.364	-1.974	5.759	.056
Produc	3.48	1.00	28.74	-1.233	-3.319	12.539	.002
Inopcs	3.30	1.15	34.85	-1.075	-4.531	21.687	.000
Market	3.60	.97	26.94	-1.582	-2.352	8.035	.018
Organi	3.70	.88	23.78	-1.616	-2.062	6.865	.032
Pdcino	3.45	.99	28.70	-1.236	-2.462	7.590	.022
Improv	3.40	.96	28.24	-.778	-2.207	5.479	.065
Contin	3.26	1.07	32.82	-.764	-2.812	8.493	.014
Flexib	3.37	.95	28.19	-.839	-1.253	2.274	.321
Crsfun	3.55	.86	24.23	-.914	-1.039	1.915	.384
Team	3.45	1.01	29.28	-1.305	-2.484	7.875	.019
Learni	3.52	1.03	29.26	-1.656	-3.100	12.351	.002
Truth	3.44	1.05	30.52	-1.345	-3.187	11.967	.003
Goods	3.45	.99	28.70	-1.221	-2.322	6.885	.032
Price	3.41	1.07	31.38	-1.333	-3.551	14.389	.001
Chanal	3.45	1.03	29.86	-1.186	-2.713	8.768	.012
Sales	3.55	.90	25.35	-.934	-1.756	3.958	.138
Resour	3.53	.99	28.05	-1.437	-2.583	8.738	.013

Note: Co-Creation = CoCrea; Speed =Speed; Innovations=Innova; Process=Proces; New Product Development Team=NPDteam; Marketing Strategy =MarStr;

Technology =Techn; Leadership=Leader; Government Policy=GovPol

It is important to confirm the reliability and validity before to examine the relationship between variables. To examine the internal item's reliability, factor loading is considered which must be higher than 0.4. This study achieved the minimum criteria of factor loadings. Additionally, convergent validity is considered with the help of construct reliability and average variance extracted (AVE). Construct reliability is higher than 0.6 which is minimum threshold level and average variance extracted (AVE) is higher than 0.5. The achievement of these values confirmed the convergent validity. All the values are reported in Table 2.

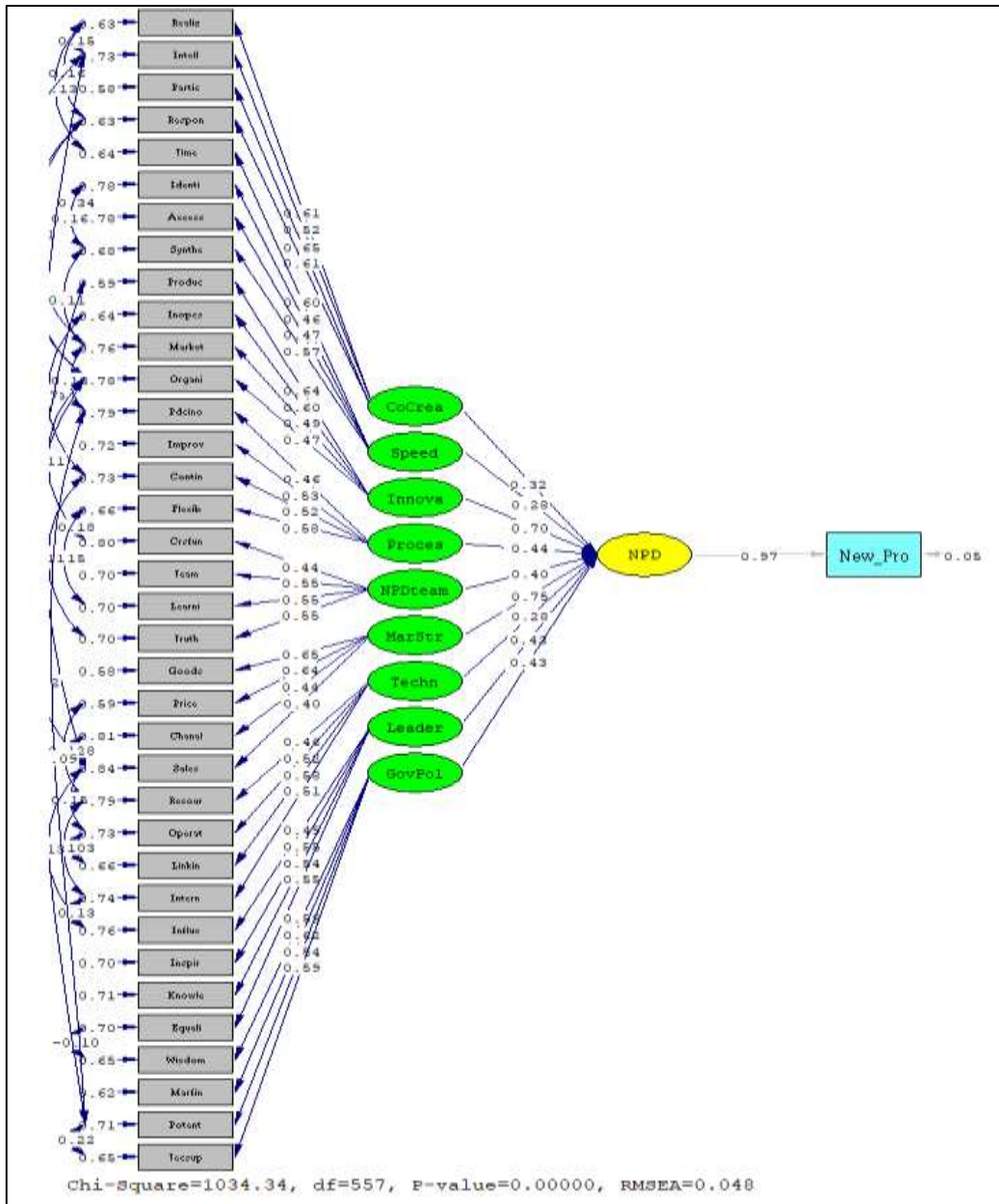
Table 2 Factor Loadings. (n = 740)

Variable	Factor Loading (λ)	Error (θ)	Construct Reliability, (ρ_c)	Average Variable Extracted, (ρ_v)
1. CoCrea	.52 - .65	.58 - .73	.69	.56
2. Speed	.46 - .60	.64 - .78	.63	.53
3. Innova	.47 - .64	.59 - .78	.62	.51
4. Proces	.46 - .58	.66 - .79	.61	.52
5. NPDteam	.44 - .55	.70 - .80	.60	.51
6. MarStr	.40 - .65	.58 - .84	.62	.51
7. Techn	.46 - .58	.66 - .79	.69	.54
8. Leader	.49 - .55	.70 - .76	.61	.50
9. GovPol	.54 - .62	.62 - .71	.68	.53
10. NPD	.97	.05	.95	.94

Note: Co-Creation = CoCrea; Speed =Speed; Innovations=Innova; Process=Proces; New Product Development team=NPDteam; Marketing Strategy =MarStr; Technology =Techn; Leadership=Leader; Government Policy=GovPol

Moreover, this study used SEM Structural Model to examine the relationship between variables (Hair Jr et al., 2021; Purwanto & Sudargini, 2021; Sarstedt, Hair Jr, Nitzl, Ringle, & Howard, 2020). In this process of data analysis, the significance value and beta value are considered to test the hypotheses. The effect of co-creation, speed for entering the market, innovation, process, new product development teams, marketing strategies, technology, leadership and government support is considered in relation to the NPD. Results of the study are reported in Table 3. It is evident that; co-creation, speed for entering the market, innovation, process, new product development teams, marketing strategies, technology, leadership and government support has significant effect on NPD. The model of the study along with results is given in Figure 1.

In addition, the findings from the qualitative research revealed that the community enterprises in Nonthaburi Province wanted the government and related agencies to provide support in terms of online marketing implementation which can effectively help in bringing new products into the market in order to better respond to customer behavior.



Note: Co-Creation = CoCrea; Speed =Speed; Innovations=Innova; Process=Proces; New Product Development Team=NPDteam; Marketing Strategy =MarStr; Technology =Techn; Leadership=Leader; Government Policy=GovPol

Figure 1. Model (n=740)

Table 3 Parameter estimation result of direct effect coefficient, indirect effect, and total effect from the model (n=740)

Variable	Effect	R ²
Co-Creation (CoCrea)	DE	.32* (9.29)
	IE	-
	TE	.32* (9.29)
Speed (Speed)	DE	.28* (9.26)
	IE	-
	TE	.28* (9.26)
Innovations (Innova)	DE	.70* (9.46)
	IE	-
	TE	.70* (9.46)
Process (Proces)	DE	.24* (9.73)
	IE	-
	TE	.24* (9.73)
New Product Development Team (NPDteam)	DE	.40* (9.00)
	IE	-
	TE	.40* (9.00)
Marketing Strategy (MarStr)	DE	.75* (9.47)
	IE	-
	TE	.75* (9.47)
Technology (Techn)	DE	.28* (9.07)
	IE	-
	TE	.28* (9.07)
Leadership (Leader)	DE	.43* (9.50)
	IE	-
	TE	.43* (9.50)
Government Policy (GovPol)	DE	.43* (9.02)
	IE	-
	TE	.43* (9.02)

$\chi^2 = 1034.34$ df = 557 p-value = .00000 , $\chi^2 / df = 1.85$, RMSEA = .048, RMR = .042, SRMR = .043, CFI = .97, GFI = .93, AGFI = .91, CN = 296.95

Note: Co-Creation = CoCrea; Speed =Speed; Innovations=Innova; Process=Proces; New Product Development Team=NPDteam; Marketing Strategy =MarStr; Technology =Techn; Leadership=Leader; Government Policy=GovPol

Conclusion

Findings of the study highlighted that; co-creation, speed for entering the market, innovation, process, new product development teams, marketing strategies, technology, leadership and government support has important relationship with NPD. The promotion of these factors can expediate the process of NPD among the small and micro enterprises in Nonthaburi province, Thailand. The findings highlighted that: 1) levels of the antecedents including co-creation, speed for entering the market, innovation, process, new product development teams, marketing strategies, technology, leadership and government support in the NPD of the community enterprises in Nonthaburi Province were rated at a high level; 2) the antecedent factors including co-creation, speed for entering the market,

innovation, process, new product development teams, marketing strategies, technology, leadership and government support has an influence on the success in the NPD of the community enterprises in Nonthaburi Province, has significant positive effect on NPD, and 3) the model for the success in the NPD of the community enterprises in Nonthaburi province, developed by the researcher, was called the CSIPNMTLG Model, consisting of C (referring to co-creation), S (referring to speed), I (referring to innovation), P (referring to process), N (referring to new product development teams), M (referring to marketing strategies), T (referring to technology), L (referring to leadership), and G (referring to government policy).

Implications of the Study

Although the number of previous studies carried out research on NPD, however, the NPD development in small and micro enterprises are not considered. Furthermore, the NPD success among the local communities in Nonthaburi Province, Thailand is not considered. Consequently, the current study considered the neglected area of Thailand in relation to examine the NPD performance along with the factors affecting on NPD. With the help of identifying different factors which has influential role in NPD among the small and micro enterprises in Thailand. This study contributed by identifying following important factors; co-creation, speed for entering the market, innovation, process, new product development teams, marketing strategies, technology, leadership and government support. Furthermore, along with these factors the current study employed mixed method research approach. NPD is considered by other studies with the help of quantitative research or qualitative research, but only few studies considered mixed method approach. Most importantly, the phenomena of NPD in Nonthaburi Province is not considered with the help of mixed method approach. Therefore, this study contributed methodologically along with the theoretical contribution. These findings of the study are helpful for the practitioners as well as academicians to promote NPD in local community of Thailand. It is recommended to the practitioners to promote NPD among small and micro enterprises by promoting co-creation, speed for entering the market, innovation, process, new product development teams, marketing strategies, technology, leadership and government support. These research findings can be applied as the guidelines for formulating policies in enhancing the success in the development of the new products of the community enterprises in Nonthaburi Province based on the determined variables which in turn help them to gain competitive advantage.

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