How to Cite:
Kerdpitak, C., Kakhai, K., Phusalux, J., & Pongpeng, T. (2022). Determinants of product innovativeness on innovation performance for pharmaceutical business in Thailand. *International Journal of Health Sciences*, *6*(S4), 161–173. https://doi.org/10.53730/ijhs.v6nS4.5459

Determinants of Product Innovativeness on Innovation Performance for Pharmaceutical Business in Thailand

Chayanan Kerdpitak
Suan Sunandha Rajabhat University, Thailand
Email: chayanan.ke@ssru.ac.th

Kuncharee Kakhai
Suan Sunandha Rajabhat University, Thailand
Email: kuncharee.ka@ssru.ac.th

Jongdee Phusalux
Suan Sunandha Rajabhat University, Thailand
Email: jongdee.ph@ssru.ac.th

Teerapong Pongpeng
Suan Sunandha Rajabhat University, Thailand
Email: teerapong.po@ssru.ac.th

***Abstract*---**Emotional capability is an important part of firm capabilities that play a crucial factor in improving the existing innovation performance of the sector, this capability should be expanded by firms to get better performance in the field of innovation. The main objective of this research paper is to find the impact of emotional capability on the innovation performance of the pharmaceutical sector of Thailand. The model of this research study includes many dimensions of emotional capability such as dynamics of display freedom, identification, reconciliation, and experience. The mediating role of product innovativeness was also been identified in enhancing the relationship between emotional capability and innovation performance. For this purpose, most of the data and information of this research were collected from employees and managers of different pharmaceutical firms of Thailand using the technique of a questionnaire survey. The structural equation modeling technique is used to check the validity of hypotheses along with KMO method. The findings of this research paper indicate that all the proposed hypotheses are accepted which means that the independent variable of the emotional capability of a firm can significantly improve the innovation performance. In this research, investigation about

identification and experience revealed that these two dynamics of EC can positively affect the firm's innovation performance.
Keywords---Emotional capability, product innovativeness, innovation performance, product innovativeness.

Introduction

Product Innovation is the most widely researched notion of innovation in the academic literature, (Brown & Eisenhardt, 1995; Bustinza, Gomes, Vendrell-Herrero, & Baines, 2019; Prajogo & Ahmed, 2006). The emotional capability is deeply embossed in the system of interactions among the people and the processes. The emotional dynamics which define the phenomenon of emotional capability are the emotional conditions possessed by any organization (Liu & Maitlis, 2014). It is this emotional capability which can play an effective role in drug innovativeness of pharmaceutical firms in Thailand.

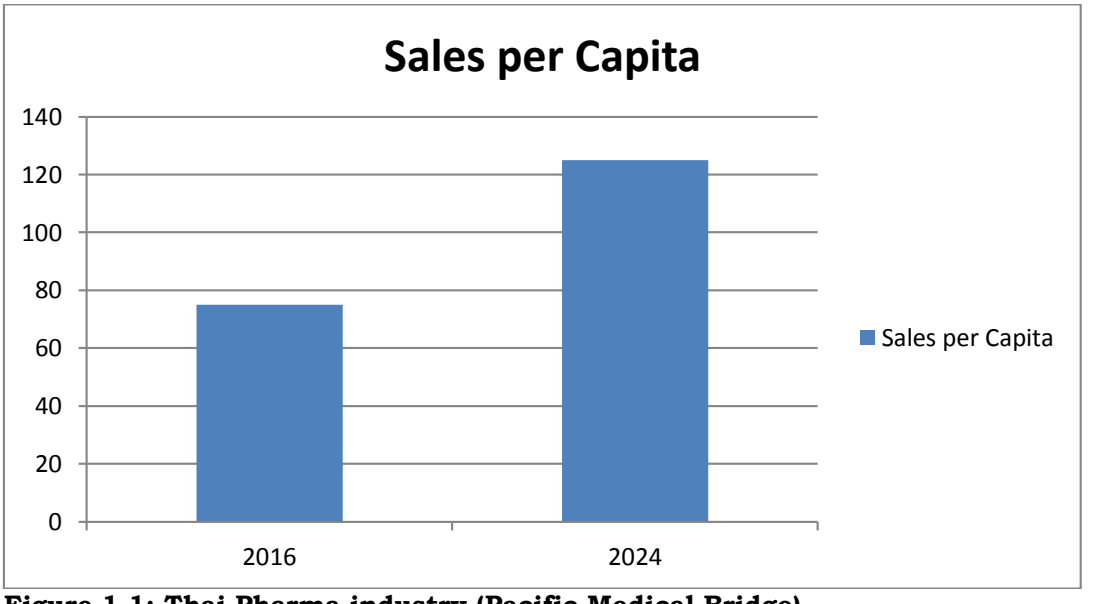


Figure 1.1: Thai Pharma industry (Pacific Medical Bridge)

Thailand is the second country with largest population in South East Asia after Indonesia and also second in the drug sector. As shown in figure 1.1 and table1.1, this sector is expected to undergo major growth in the coming years as the need for new and improved drugs is in high demand.

	USD billion
2016	5
2024 (projected)	10

Table 1.1: Thai Pharma market growth

Although Innovation and Innovativeness have been in limelight in academic research, however study by have pin pointed that there is a deficiency of

investigations using the integration of the variables of interest (Kobarg, Stumpf-Wollersheim, & Welpe, 2019; Li, 2019; Muller & Peres, 2019; Rauter, Globocnik, Perl-Vorbach, & Baumgartner, 2019). Hence, this paper addresses this discrepancy in the literature. The main objective for this study is to explore the extent to which the pharmaceutical firms in Thailand are seriously thinking of adopting Innovativeness through the dimensions of emotional capability for inducing the drug innovativeness. More specific research objectives for the study are the following:

- To determine how DDF affects IP
- To determine how DE affects IP
- To determine how DR affects IP
- To determine how DI affects IP
- To determine if PI acts as a mediator in these relationships

Theoretically, this study adds contribution to the academic body of knowledge by determining the effects of emotional capability dimensions on IP with PI as the potential underlying mechanism. Practically, this study will prove useful for managers of firms in that they must focus on developing emotional capability and encourage innovative ideas from workers to achieve the firm's objective of innovation performance.

Literature Review

Theoretical background

The foundations of this paper lie in the "Structuration theory', conceived by (Giddens, 1984). This theory postulates that the emotions of an individual can originate from the culture and structure of an organization and vice versa, i.e., the culture and structure of an organization is influenced or designed by interaction of emotions (Giddens, 1991; Stones, 2005).

Impact of Dynamics of Display Freedom (DDF)

DDF is the ability of any firm to accommodate a diverse range of emotions that can be shown and experienced freely in the firms. This has benefit regarding the learning abilities of the workers (Ashforth & Humphrey, 1995; Perel, 2005). When people freely exhibit their feelings or emotions, i.e., without any fear or hesitation, they are compelled to work in novel and new ways with more mental power and energy to put these ideas into the form of real innovative products (Huy, 2005b). This freedom, also, encourages knowledge sharing among workers which improves the quality of the socialization among the colleagues. These factors eventually lead to improved work performance (Akgün, Keskin, & Byrne, 2009; Börjesson & Löfsten, 2012). This means that DDF has positive effects on firm's IP. Hence the hypothesis:

H1: DDF has significant linkage with IP

Impact of Dynamics of Identification (DI)

DI means the behavior of the organizational members in which they exhibit the attachment they have with their organization and its values. The previous studies

have shown that emotional feelings and bondage of workers with their organizations promotes feelings of collaboration and cooperation among them, which improves their performance at work (Kobarg et al., 2019). They understand the true intention and meaning behind the organization's vision and mission so they start practicing self- control of emotions in their work and this boost their loyalty to work, eventually putting efforts towards experimentation and producing innovative work (Akgün, Keskin, & Byrne, 2008; Huy, 2005b). This leads to IP of firms, indicating positive relationship among them. Hence, the study can hypothesize:

H2: DI has significant linkage with IP

Impact of Dynamics of Experiencing (DE)

DE is the extent of the efforts made by a firm in the understanding of the process of identification of various emotions so that actions could be taken accordingly. When workers in a firm have better comprehensibility of emotions shown by others, they can react more appropriately which forges collaboration and voluntarism, thus enhancing their intuitive learning (Hodgkinson & Sadler-Smith, 2018) and socialization abilities (Nahapiet & Ghoshal, 1998). This promotes the creation and transfer of knowledge in the form of new ideas to boost the IP. So, it can be seen that positive linkages exist between DE and IP. Hence, the hypothesis:

H3: DE has significant linkage with IP

Impact of Dynamics of Reconciliation (DR)

The way by which an organization strives to bring close together two or more values in opposition to each other is referred to as DDR. When employees have to deal with opposing or diverse ideas, this promotes group discussions and healthy arguments in them (Bantel & Jackson, 1989; Kerdpitak, 2020). This way people get to learn more about non- routine issues and then they brain storm for finding solutions to generate strategic conversations (Liu & Maitlis, 2014), which promotes their innovative abilities and performance, leading to better IP for the firm (Huy, 1999; Kerdpitak, 2022). This proved that DR and IP are positively linked to each other. Hence, the hypothesis can be made:

H4: DR has significant linkage with IP

Mediation of Product Innovativeness (PI)

Introducing a new product by any firm in the market with novelty in it is knows as PI. The extent of PI leads to success of the firm (Danneels & Kleinschmidt, 2015; Deshpandé, Farley, & Webster Jr, 1993; Han, Kim, & Srivastava, 1998; Hurley & Hult, 1998). Prior studies have empirically reflected upon the importance of product innovativeness on firm performance (Avlonitis & Salavou, 2007; Brockman & Morgan, 2003; Pullen, de Weerd-Nederhof, Groen, & Fisscher, 2012; Salomo, Weise, & Gemünden, 2007). (Akgün et al., 2009; Akgün, Keskin, Byrne, & Aren, 2007; Kerdpitak, 2021) have proved that PI, created as a result of emotional capabilities, positively affects the performance. The findings of these studies imply that PI can be tested as mediating the above mentioned relationships. Hence, the study has made following hypothesis:

H5a: PI serves as a significant mediator in the association of DDF and IP

H5b: PI serves as a significant mediator in the association of DI and IP
H5c: PI serves as a significant mediator in the association of DE and IP
H5d: PI serves as a significant mediator in the association of DR and IP

Theoretical Model

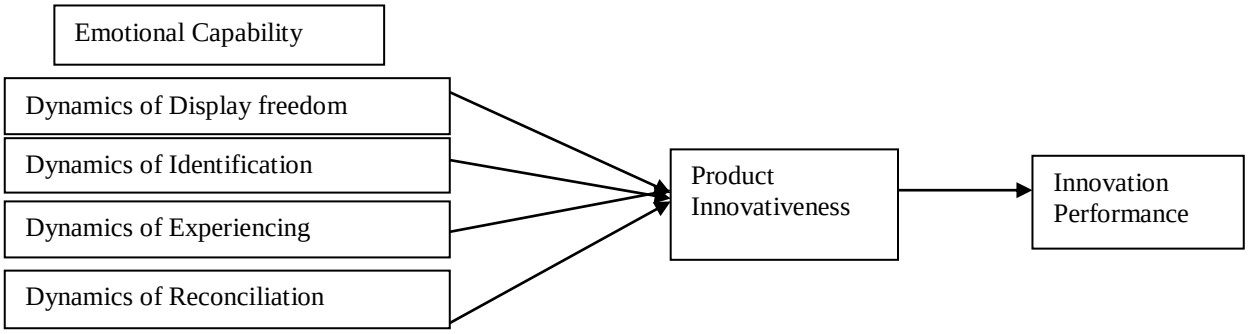


Figure 1.2: Research Framework

Methodology
Participants and procedure

This research is based on data gathered from pharmaceutical industry of Thailand, that is highly innovative. Participants of the survey were employees engaged in different local and international pharmaceutical firms. These participants were selected by purposive sampling so findings can be more generalizable. Purposely 314 workers from 50 Thai firms were included in sample. Demographically, male was leading the sample size 56.4% were males and female were 43.6% of total sample. Mostly aged between 25 years to 35 years and devouring 2-5 years of experience. Responses were obtained through self-administrative questionnaires mailed to different firms that was prepared by research expert having corporate experience as well. Further it was pretested with business student. Before administration of questionnaire different firms were contacted to ask their consent and to explain the purpose of research out of 50 firms agreed to participate. The respondents were given questionnaires in their workplace to fill the self-recorded questionnaires. Primarily 450 questionnaires copies were forwarded to the firms that agreed, but still only 350 questionnaires were filled by respondents between which only 314 were kept for analysis because other were not usable due to unsatisfactory responses.

Measures
Emotional capability

In present study's purposed model emotional capability has four dimensions' dynamic of identification, dynamics of experience and dynamics of reconciliation. This construct was assessed by developing the questions based on Huy (2005a) research on EC. Total eleven items were adapted to fit research context Three questions measure dynamic of display freedom, three for dynamic of identification, and three items for both dynamic of experiencing and reconciliation. Exemplary items are Learning and exploration of the alternatives

are not bounded in our firm and Members of our firm express their deep attachment to salient organizational characteristics such as values and beliefs. Responses were stated on 5 point Likert scale that showed Cronbach's alpha of 0.92 which means high emotional capability.

Product innovativeness

Product innovativeness Questionnaire was used to measure drug making firms innovativeness, by modifying three items from this scale including "Our new products and services are often perceived as very novel by customers". Response for these item is rated on a 5-point response scale from 1 (highly opposite) to 5 (highly similar). Results indicate satisfactory reliability, with a Cronbach's alpha = 0.78.

Innovation performance

Innovation performance measurements were adapted from Miller and Friesen (1982). 5 items were used to measure Innovation Performance (The level of newness (novelty) of our firm's new products). Innovation performance reflects the new products, process and technologies used in firms. Results showed α =0.83 for innovation performance.

Data Analysis

To test the hypothesis data was analyzed by utilizing AMOS and SPSS statistical software that are commonly used in research. The validity of scales and items was checked by running CFA and descriptive statistics test. Factor loading of each was also yielded. Overall, the measurement models' assessment results satisfied the reliability requirements. Kaiser-Meyer-Olkin Measure and Bartlett's Test of Sphericity quantified the appropriateness of sampling. To test structual relationship between hypothetical model, Structural Equation Model was used to pull results of hypothesis.

Results Interpretation
Demographics

A sample of 309 selected individuals was developed for the research study, out of which 52.1% were male and 47.9% were females, and the main reason behind considering this section is the fact that more men were identified to be employed in the units of manufacturing of pharmaceutical sector. The age of 28.8% of the identified respondents was up to 30 years. The major objective for the elevation observed in education level and age is the extent of respondents approached.

Descriptive statistics

Table 1 is the representation of descriptive statistics which mainly contains the minimum and maximum values, and it also contains the coefficients of means and skewness which is necessary for identifying the data and information for the presence of outliers. Mean and skewness are also been analyzed to check the normality level of data and also the inclination of responses. The above

measurements mainly indicate a descriptive analysis of the collected information and data. The values of skewness also fall within the category of +1 and -1, which mainly exhibits the normality level of selected data.

Table 1: Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error
DoD	309	1.00	5.00	3.5248	1.15995	-.724	.139
DoI	309	1.00	5.00	3.5785	1.16129	-.798	.139
DoE	309	1.00	5.00	3.6209	1.00628	-.843	.139
DOR	309	1.00	6.33	3.4321	1.08336	-.232	.139
ProInn	309	1.00	5.00	3.5429	1.07344	-.842	.139
InnPer	309	1.00	5.00	3.4506	1.11197	-.523	.139
Valid N (listwise)	309						

Factor loading and convergent/discriminant validity

The score and level of composite reliability are higher than 0.8 and the CR and AVE are also more than 0.6. The PI and DOD values are much higher than 0.5. Therefore, the convergent and discriminant validity are present.

Table 2: Factor Loading and Convergent Validity

1	2	3	4	5	6	CR	AVE
DoD1		.808				0.928	0.819
DoD2		.859					
DoD3		.834					
DOI1	.826					0.929	0.811
DOI2	.853						
DOI3	.878						
DOE1			.808			0.901	0.753
DOE2			.857				
DOE3			.812				
DOR1					.752	0.868	0.687
DOR2					.791		
DOR3					.816		
PI1				.748		0.887	0.726
PI2				.798			
PI3				.814			
IP1 .802						0.952	0.801
IP2 .834							
IP3 .873							
IP4 .875							
IP5 .892							

Confirmatory factor analysis and KMO

The results and findings constructed from confirmatory factor analysis (Hassan, Hameed, Basheer, & Ali, 2020; Iqbal & Hameed, 2020)are presented in table 4. The CMIN value is 1.53, less than 3, GFI is much higher than 0.8(0.93). On the other hand, IFI and CFI are higher than 0.9(0.984) and the value of RMSEA is less than 0.8(0.042). KMO test is a significant type of test that mainly used in measuring the adequacy of samples that is proposed to find the case to the ratio of variables. KMO test provides many facilities for testers and analysts of the studies.

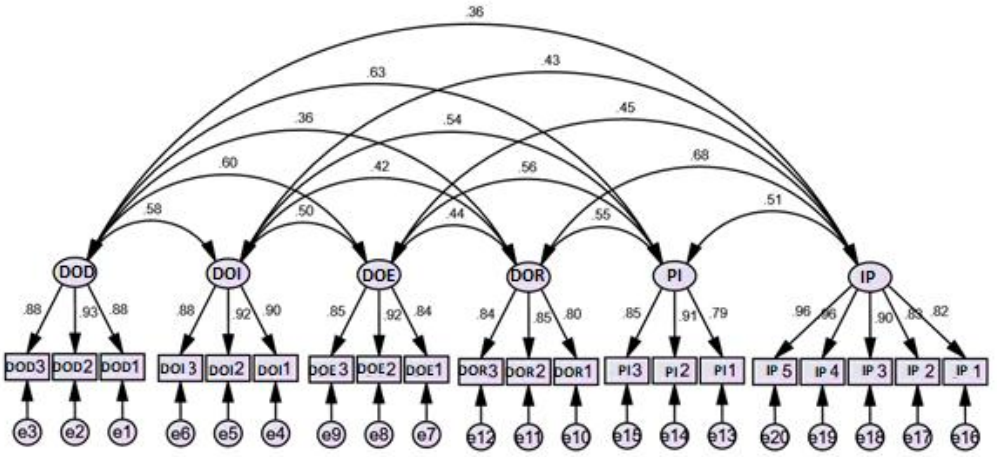
Table 3: Discriminant Validity

	PI	**DoD**	**DOI**	**DOE**	**DOR**	**IP**
PI	**0.854**					
DoD	0.631	**0.901**				
DOI	0.545	0.578	**0.901**			
DOE	0.565	0.597	0.501	**0.869**		
DOR	0.552	0.357	0.421	0.445	**0.831**	
IP	0.507	0.355	0.426	0.448	0.685	**0.898**

Table 4: Confirmatory Factors Analysis and KMO

CFA Indicators	CMIN/DF	GFI	IFI	CFI	RMSEA	KMO
Threshold Value	≤ 3	≥ 0.80	≥ 0.90	≥ 0.90	≤ 0.08	0.6 – 1.0
Observed Value	1.536	0.932	0.986	0.984	0.042	0.915

Figure 1: CFA



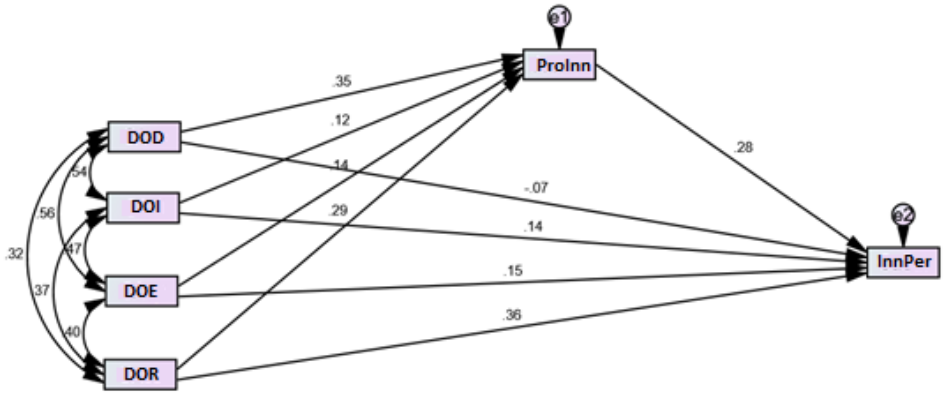
SEM

A unit change in DoD develops a negative or insignificant impact of 0.35% in IP, the relationship between DoD and IP is negative and therefore the hypotheses are rejected and not supported to results. A unit increase in DOI and generated a positive effect of 0.1% in IP, the relationship is positive and then the hypotheses are accepted. A significant enhancement in DOE and DOR generated variations and changes of 0.15% and 0.36% in IP. The relationships are favorable and then the hypotheses were are also accepted and supported to the results of the study.

Table 5: Structural Equation Modeling

Hypothesis	B-Value	SE	P-Value	Decision
DoD→IP	-.076	.057	.195	Rejected
DOI→IP	.141	.052	.007	Accepted
DOE→IP	.148	.054	.005	Accepted
DOR→IP	.362	.052	.000	Accepted
DoD→PI→IP	.101	.034	.010	Accepted
DOI→PI→IP	.035	.024	.146	Rejected
DOE→PI→IP	.037	.021	.010	Accepted
DOR→PI→IP	.082	.031	.010	Accepted

Figure 2: SEM



Discussion and Conclusion
Discussion

Innovation performance of a firm relies on many organizational factors that directly influence the process of innovation such as the emotional capability and

learning capability of a firm (Jajja, Kannan, Brah, & Hassan, 2017). According to the initial results of the study, it is indicated that the role of emotional capability in enhancing the innovation performance of a firm has been significant. A firm with a positive degree of emotional capability can significantly manage the emotions of their employees and also acknowledge and recognize their emotions. The findings of the study indicate that the role of dynamic of display freedom (DDF) and dynamic of identification positively influence the process of innovation performance. That's why the hypotheses have been accepted and supported by the findings of the study. According to a study by Schoemaker, Heaton, and Teece (2018), dynamic display freedom is a special ability of a firm to facilitate the authentic emotions that can be felt and displayed in the firm, with this advantage the innovation performance of the firm will be enhanced.

The findings of this research study also indicate that the mediating variable of product innovativeness positively mediates the relationship between the emotional capability of a firm and innovation performance. Product innovativeness is another significant capability of a firm that makes positive changes in the functional as well as technical specifications of product which enhance the innovation performance of the firm. Therefore, the hypothesis has been accepted

Conclusion

The research paper indicates that the firm taking care of the emotions of the employees of the firm and the innovations. The firms taking the industry to lead in the field of Pharmaceutical by appreciating the innovativeness in the products and the systems and technology. The study suggests that display and innovations, freedom of expressions, ideas, identification of various issues and the solutions can bring good experience and reconciliation among the employees of the firm but also at the managerial level.

Implications and Limitations

This study elaborately describes the various functions and the importance of the firms taking innovations a serious step and implementing them to earn a relatively standard place in the pharmaceutical industry. This study has a positive influence and accepted deliberately.

There are some restrictions and methodological limitations in this research that must be considered by future analysts. First, the model of this study limited to the role of the emotional capability of a firm in evaluating the innovation performance of the firm. So, future studies should add other independent variables for more accurate results and findings. Using a cross-sectional approach with the questionnaire technique was also another limitation of this study which should be addressed in future studies.

References

Akgün, A. E., Keskin, H., & Byrne, J. (2008). The moderating role of environmental dynamism between firm emotional capability and performance. *Journal of Organizational Change Management*.

Akgün, A. E., Keskin, H., & Byrne, J. (2009). Organizational emotional capability, product and process innovation, and firm performance: An empirical analysis. *Journal of Engineering and Technology Management, 26*(3), 103-130.

Akgün, A. E., Keskin, H., Byrne, J. C., & Aren, S. (2007). Emotional and learning capability and their impact on product innovativeness and firm performance. *Technovation, 27*(9), 501-513.

Ashforth, B. E., & Humphrey, R. H. (1995). Emotion in the workplace: A reappraisal. *Human relations, 48*(2), 97-125.

Avlonitis, G. J., & Salavou, H. E. (2007). Entrepreneurial orientation of SMEs, product innovativeness, and performance. *Journal of Business Research, 60*(5), 566-575.

Bantel, K. A., & Jackson, S. E. (1989). Top management and innovations in banking: Does the composition of the top team make a difference? *Strategic Management Journal, 10*(S1), 107-124.

Börjesson, S., & Löfsten, H. (2012). Capabilities for innovation in small firms–a study of 131 high-tech firms and their relation to performance. *International Journal of Business Innovation and Research, 6*(2), 149-176.

Brockman, B. K., & Morgan, R. M. (2003). The role of existing knowledge in new product innovativeness and performance. *Decision Sciences, 34*(2), 385-419.

Brown, S. L., & Eisenhardt, K. M. (1995). Product development: Past research, present findings, and future directions. *Academy of management review, 20*(2), 343-378.

Bustinza, O. F., Gomes, E., Vendrell-Herrero, F., & Baines, T. (2019). Product–service innovation and performance: the role of collaborative partnerships and R&D intensity. *R&d Management, 49*(1), 33-45.

Danneels, E., & Kleinschmidt, E. J. (2015). *product innovativeness from the firm's perspective: its dimensions and their impact on project selection and performance*. Paper presented at the Proceedings of the 1999 Academy of Marketing Science (AMS) Annual Conference.

Deshpandé, R., Farley, J. U., & Webster Jr, F. E. (1993). Corporate culture, customer orientation, and innovativeness in Japanese firms: a quadrad analysis. *Journal of Marketing, 57*(1), 23-37.

Giddens, A. (1984). *The constitution of society: Outline of the theory of structuration*: Univ of California Press.

Giddens, A. (1991). Structuration theory. *Past, Present and Future. In: Bryant, C. and Jary, D.(eds.). Giddens' Theory of Structuration. A Critical Appreciation. London: Routledge*.

Han, J. K., Kim, N., & Srivastava, R. K. (1998). Market orientation and organizational performance: is innovation a missing link? *Journal of Marketing, 62*(4), 30-45.

Hassan, S. G., Hameed, W. U., Basheer, M. F., & Ali, J. (2020). ZAKAT COMPLIANCE INTENTION AMONG SELF-EMPLOYED PEOPLE: EVIDENCE FROM PUNJAB, PAKISTAN. *AL-ADWAH, 34*(2), 80-96.

Hodgkinson, G. P., & Sadler-Smith, E. (2018). The dynamics of intuition and analysis in managerial and organizational decision making. *Academy of management perspectives, 32*(4), 473-492.

Hurley, R. F., & Hult, G. T. M. (1998). Innovation, market orientation, and organizational learning: an integration and empirical examination. *Journal of marketing, 62*(3), 42-54.

Huy, Q. N. (1999). Emotional capability, emotional intelligence, and radical change. *Academy of management review, 24*(2), 325-345.

Huy, Q. N. (2005a). An emotion-based view of strategic renewal. *Advances in strategic management, 22*, 3-37.

Huy, Q. N. (2005b). Emotion management to facilitate strategic change and innovation: How emotional balancing and emotional capability work together *Emotions in organizational behavior* (pp. 302-323): Psychology Press.

Iqbal, J., & Hameed, W. U. (2020). Open Innovation Challenges and Coopetition-Based Open-Innovation Empirical Evidence From Malaysia *Innovative Management and Business Practices in Asia* (pp. 144-166): IGI Global.

Jajja, M. S. S., Kannan, V. R., Brah, S. A., & Hassan, S. Z. (2017). Linkages between firm innovation strategy, suppliers, product innovation, and business performance. *International Journal of Operations & Production Management*.

Kerdpitak C.(2020). The decision of travelers in choosing to use of service low-cost airlines.*International*

Journal of Business Tourism and Applied Sciences. 8(2), 43-51.

Kerdpitak C. (2022). Business Performance Model of Herbal Community Enterprise in Thailand.

*Uncertain Supply Chain Management.*Vol.10 No.2 P.345-352.

Kerdpitak C. (2021). The relationship between CRM strategy and customer satisfaction in rice

business in north-eastern Thailand. *Journal of Southwest Jiaotong University*. Vol. 56 No. 2 P.431-442.

Kobarg, S., Stumpf-Wollersheim, J., & Welpe, I. M. (2019). More is not always better: Effects of collaboration breadth and depth on radical and incremental innovation performance at the project level. *Research Policy, 48*(1), 1-10.

Li, S. (2019). *The relationship between organizational emotional capability and employee innovation behavior of S&T enterprise.* Paper presented at the 3rd International Seminar on Education Innovation and Economic Management (SEIEM 2018).

Liu, F., & Maitlis, S. (2014). Emotional dynamics and strategizing processes: A study of strategic conversations in top team meetings. *Journal of Management Studies, 51*(2), 202-234.

Miller, D., & Friesen, P. H. (1982). Innovation in conservative and entrepreneurial firms: Two models of strategic momentum. *Strategic management journal, 3*(1), 1-25.

Muller, E., & Peres, R. (2019). The effect of social networks structure on innovation performance: A review and directions for research. *International Journal of Research in Marketing, 36*(1), 3-19.

Nahapiet, J., & Ghoshal, S. (1998). Social capital, intellectual capital, and the organizational advantage. *Academy of management review, 23*(2), 242-266.

Perel, M. (2005). You can innovate in hard times. *Research-Technology Management, 48*(4), 14-23.

Prajogo, D. I., & Ahmed, P. K. (2006). Relationships between innovation stimulus, innovation capacity, and innovation performance. *R&d Management, 36*(5), 499-515.

Pullen, A., de Weerd-Nederhof, P. C., Groen, A. J., & Fisscher, O. A. (2012). SME network characteristics vs. product innovativeness: how to achieve high innovation performance. *Creativity and Innovation Management, 21*(2), 130-146.

Rauter, R., Globocnik, D., Perl-Vorbach, E., & Baumgartner, R. J. (2019). Open innovation and its effects on economic and sustainability innovation performance. *Journal of Innovation & Knowledge, 4*(4), 226-233.

Salomo, S., Weise, J., & Gemünden, H. G. (2007). NPD planning activities and innovation performance: the mediating role of process management and the moderating effect of product innovativeness. *Journal of Product Innovation Management, 24*(4), 285-302.

Schoemaker, P. J., Heaton, S., & Teece, D. (2018). Innovation, dynamic capabilities, and leadership. *California Management Review, 61*(1), 15-42.

Stones, R. (2005). *Structuration theory*: Macmillan International Higher Education.