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Employees' Innovative Behavior in the Workplace: A Study of Intellectual Capital Effect on the Service-oriented Companies in Thailand

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Abstract

Innovation or innovativeness is an essential factor for sustainable competitive advantages in organizations nowadays. This study aimed to explore the interaction between each element of intellectual capital (human capital, structural capital, and customer capital) with organizational employees' innovative behavior of service-oriented companies. A purposive sampling method was applied in this study. In addition, a survey was used to collect data from 423 responses of 198 public companies in Thailand. The results from the multiple linear regression and the hierarchical multiple regression analyses showed that the three elements of intellectual capital had positive associations with employees' innovative behavior in the workplace. Furthermore, the results presented that the structural capital of firms had the strongest effects on the innovative behavior among three elements of intellectual capital. The findings of this study offer not only the theoretical implications for scholars but also the practical implications for managers of service-oriented companies. The findings support that resource-based theory (RBT) not only worked as a main theoretical foundation in the scholarly literature but also noticeably featured in the field of strategic management by addressing a fundamental issue of intangible resources that can be created and accumulated for firms in the dynamic business environment. Having a higher extent of intellectual capital in firms tends to effectively encourage employees' innovative behavior in the workplace.

Keywords

Innovative work behavior, Human capital, Structural capital, Customer capital

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Introduction

In today's business world, innovation or innovativeness is a vital factor for sustaining competitive advantages in organizations (Slåtten & Mehmetoglu, 2015; Wojtczuk-Turek & Turek, 2015). An increasing number of organizations recognize that innovativeness is the capability of an organization to face and adapt to the changes in the business environment. As a consequence, there is a need for business innovation at both the organizational and individual levels (Slåtten & Mehmetoglu, 2015). No matter at which level, the root of innovation is personnel (Chen, Wu, & Chen, 2010). Also, employees' innovative behavior is the center of organizational innovation (Li & Hsu, 2016). Thus, employee's innovative behavior in the workplace can promote organizational innovation or innovativeness, so that the company achieves a competitive advantage and prospers (Choi, Kim, Ullah, & Kang, 2016; Kim & Koo, 2017). To enhance employee's innovative behavior in the workplace, evidence shows that an organization's intellectual capital has an optimistic effect on employee's innovative behavior (Mura, Lettieri, Spiller, & Radaelli, 2012). From the perspective of the management literature, intellectual capital is a non-monetary asset without a physical body but has an advantage that can generate value in the future (Kwee, 2008). It is crucial for organizations to utilize their intellectual capital with the purpose of promoting their employees' innovative behavior in the workplace. Although innovative behavior has already been investigated in the literature, the application of an organization's intellectual capital for innovative behavior of employees has not been adequately explored. Organizational-related studies have found that intellectual capital can drive employees' innovative behavior (Chou, Huang, & Lin, 2018). Innovative behavior results in a multitasking procedure (Amabile et al., 1996 as cited in Choi et al., 2016), so to analyze a multi-dimensional measure of an individual's innovative work behavior is significant. Also, Bontis (1998) divided intellectual capital into human capital, structural capital, and customer capital for understanding the attributes that can contribute value to a firm. Previous studies have explored the effects of these elements of intellectual capital on the business performance of organizations (e.g. Mills & Smith, 2011; Tseng & Lee, 2014); however, the effects on employees' innovative behavior have not been researched in quantity. These are the main research questions that are expected to be investigated in this study.

In order to discuss how the elements of intellectual capital can have effects on organizational employees' innovative work behavior, the author used a sample of the public companies from the service industry in Thailand. The services sector in Thailand contributed more than 50% of Thailand's GDP from 2007 to 2017 (Statista,2019). The Office of the National Economic and Social Development Board (NESDB) (2019) conducted a report and shows the contribution of the services sector on the economic growth of Thailand from 1993 to 2018. The report presented a “smile curve” and indicates the importance of the service

sector in Thailand. The contribution of the service sector in Thailand has been confirmed by previous research as well. For instance, Koonnathamdee (2013) stated that approximately half of the national income as well as national employment were accounted by Thailand' service sector. However, the studies that focus on service-oriented companies have still lacked. Therefore, Thailand can be considered as a proper research context for studying organizational intellectual capital and innovative behavior in service-oriented companies.

This study is structured as follows. In the next section, the author will review the literature on innovative behavior, the elements of intellectual capital, and discuss how each element of intellectual capital enhance organizational employees' innovative behavior. The hypotheses will be developed according to this literature. Then, the methodology used to test the hypotheses will be illustrated. After the consequences from the data analysis are presented, the author will go into the findings, offer some implications, and then conclude.

Literature Review

Innovative Behavior in the Service Industry

Scholars define innovative behavior in the workplace as employees' intentional actions which are directed at the generation, introduction/promotion, and or realization/ application of beneficial new ideas, products, and processes at any organizational level, in order to benefit their work performance (Janssen, 2000; Kim & Koo, 2017; Kleysen & Street, 2001; F. Yuan & Woodman, 2010). This definition thus indicates that innovative behavior is a multi-stage process. Slåtten and Mehmetoglu (2015) argued that the concepts "innovative behavior" and "creativity" are normally used interchangeably. Based on prior studies (Slåtten & Mehmetoglu, 2015; Feirong Yuan, 2005), one particular point that distinguishes innovative behavior from creativity is that creativity refers to the construction of new and useful ideas, products, or processes but innovative behavior is defined as both the production of self-generated ideas and the implementation of novel and useful ideas. In short, innovative behavior has a broader range of behaviors. Thus, innovative behavior is more commonly used in the work setting which illustrates a complex process to defeat hardness, barriers, and failure (Carmeli, Meitar, & Weisberg, 2006).

Kleysen and Street (2001) identified 289 innovation-related behaviors and categorized them into five dimensions which are opportunity exploration, generativity, formative investigation, championing, and application. Even hypothesized models of these dimensions do not lend empirical support in their study, thus a multi-dimensional concept of innovative behavior has been proposed. This concept is in line with a majority of studies that state innovative behavior in the workplace is a multi-stage concept that includes separate tasks as idea generation, idea promotion, and idea application (Choi et al., 2016; Kim & Koo, 2017; Scott & Bruce, 1994). Based on the multi-dimensional concept of innovative behavior,

many studies have applied the measure of Scott and Bruce (1994) to analyze innovative behavior at different organizational levels. For instance, Deng, Xiao, and Zhang (2019) investigated the association between team spiritual leadership and team innovative behavior within 106 R&D teams in the southwest of China and found that there was a significantly positive relationship. From the multi-dimensional view, there are three stages for innovative behavior (Janssen, Van de Vliert, & West, 2004; Scott & Bruce, 1994). In the first stage, an employee realizes a problem or barrier and produces novel and valuable ideas or solutions in any field; that is, idea generation or problem recognition. The second stage is idea promotion. In this stage, an employee seeks friends, favorers, and sponsors who can be the potential supporters to promote his or her new ideas. In the last stage, idea realization, an employee needs to fulfill the idea by building a model of innovation that can be touched and ultimately utilized among the work role, group, or whole organization. Consequently, employees' innovative behavior is a multi-stage procedure with essential and various activities.

As the operation of service-oriented enterprises is dissimilar from other kinds of firms (Bowen & Ford, 2002), it is important to explore employees' innovative behavior in the workplace of service-oriented enterprises. In general, service firms are different from manufacturers, especially in terms of the intangibility of service output (Prajogo, 2006). Job characteristics are the major differences between service firms and manufacturing firms (Dorenbosch et al., 2005 as cited in Li & Hsu, 2016). Compared to manufacturers who mainly produce tangible output by applying ordered and standard procedures (Boyt & Harvey, 1997), most of the information service firms deal with are intangible, which makes innovation difficult (Evangelista & Sirilli, 1995). For instance, Slåtten and Mehmetoglu (2015) mentioned that the nature of frontline service employees' jobs usually results in a non-structured characteristic to deal with heterogeneous needs and wants from customers. Their service-role performance is linked to customers' satisfaction, attitudes, loyalty, etc. which are not tangibly illustrated. Thus, the characteristic of service activities triggers the important role of innovation, especially in service firms (Coelho, Augusto, & Lages, 2011).

Organizational Intellectual Capital

Intellectual capital is viewed as the most important resource for today's firms to survive in a dynamic business context. Organizational intellectual capital regards intellectual capital as formalized, captured, and leveraged intellectual material for creating valued assets; and those materials can be experience, information, knowledge, learning ability, team communication, consumer relationships, brand status, and intellectual property (Stewart, 1997 as cited in Chou et al., 2018). Traditionally, the concepts of intangible assets and intellectual capital are applied interchangeably by researchers or practitioners. Both concepts consist of three elements: human facets, intra-organizational structures, and the external environment (Hussi, 2004). However, intangible assets are just static stocks, but intellectual

capital is the dynamic procedure to create interaction among these elements (Hussi, 2004). Subramaniam and Youndt (2005 as cited in Chou et al., 2018) mention that an organization's ability to innovate is systematically linked to their intellectual capital or the ability to apply their knowledge resources. Thus, the relationship between organizational intellectual capital and employees' innovative behavior in the workplace is significant. There are various definitions and categorizations for the term of intellectual capital, but the literature shows that the three dimensions typically represent intellectual capital, which are human capital, structural capital/organizational capital, and customer capital/relational capital (Bontis, Crossan, & Hulland, 2002; Chou et al., 2018; Lee, 2011; Marr & Adams, 2004; Sidharta, Priadana, & Affandi, 2019).

Human Capital and Innovative Behavior

A majority of studies have stated that human capital is essential and the most valuable asset to an organization's intellectual capital (Alpkan et al., 2010; Sidharta et al., 2019). Human capital indicates all kinds of skills and knowledge possessed by employees and managers in a company, including dynamic experience, personal ability, and technological capability (Ramezan, 2011). Every individual owns various knowledge and different experience; this knowledge and experience are tacit, so it is hard to be duplicated. Compared to tangible resources, human capital is a significant and rare intangible resource that can create or increase competitive advantages to a firm by utilizing corporate resources based on the resource-based theory (Alpkan, Bulut, Gunday, Ulusoy, & Kilic, 2010; Han & Li, 2015). Employees' knowledge can result from their education level and their skills can be accumulated from their experience, training, and working tenure. Human capital enables employees to assimilate new knowledge and expertise (Chou et al., 2018), thereby allowing them to enhance their search behaviors to solve problems (Lee, 2011). Search behaviors include two dimensions, search depth and search scope, the former is defined as the extent to find a solution to revisit previous knowledge; and the latter is defined as the extent to explore new knowledge (Ahuja & Katila, 2001). Scholars state that capable employees are the most important component in innovation (Han & Li, 2015; Ramezan, 2011). Employees with better quality education, training, and experience tend to have a deeper understanding of new knowledge, which eventually enhances their abilities to generate solutions to strengthen their work performance. Research conducted by Chou et al. (2018) on frontline service employees working at a Taiwan travel agency proved that human capital has a positive effect on their innovative behavior. Alpkan et al. (2010) conducted a study covering managerial officers from 184 manufacturing firms in Turkey and found human capital to be an important driver toward their innovative performance. Therefore, Han and Li (2015) illustrated that employees' innovative behavior can be inspired by employees with a better level of knowledge.

Based on the above discussion, the first hypothesis is proposed as follows:

H1: Human capital has a positive effect on employees' innovative behavior in the workplace.

Structural Capital and Innovative Behavior

Structural capital is underlined as the most independent and steady facet of intellectual capital because it does not rely on individual mobility. Structural capital consists of non-human assets in an organization, such as codified knowledge, managerial processes or routines, information systems, and the culture of the organization that originated from the products and systems developed by the company throughout its life cycle (AlQershi, Abas, & Mokhtar, 2021; Archer-Brown & Kietzmann, 2018; Lee, 2011). Structural capital in an organization is difficult or impossible to be imitated since it is characterized in a non-commutable nature (AlQershi et al., 2021). Structural capital can update the knowledge base of an organization and improve innovation (Subramaniam & Youndt, 2005). For instance, the records of past databases and library archives allow employees to access valuable references to solve similar problems. People accept codified knowledge more since it is more reliable, stable, and legal (Katila, 2002). Therefore, the higher level of structural capital in an organization, the more knowledge, and valuable records are accumulated by the organization per se.

In addition to codified knowledge, a supportive internal environment and friendly operational system are essential parts of the structural capital of a firm to impact employees' behaviors (Chou et al., 2018). Support, no matter from companies or supervisors, encourages employees willing to share their knowledge with others, so that they produce creative activities or innovative ideas. When an employee dares to speak out, communication within a team or an organization then happens, so they may develop their innovative behaviors. This is in line with a suggestion by Li and Hsu (2016), that supervisory support may enhance organizational members' creativity. Additionally, managerial procedures or routines of organizations influence employees' innovative behaviors. In an organization, a formal order of steps or a routine is usually adapted from prior successful practices, so the disciplined methods can help employees to reduce time and effort to make decisions, thereby quickly and effectively responding to problems and finding solutions (Lee, 2011). When a firm complies and handles resources efficiently, shares information or knowledge openly, and have a supportive organizational culture, there will be a positive result in employees' innovative work behavior (Ramezan, 2011).

Hence, the second hypothesis is as follows:

H2: Structural capital has a positive effect on employees' innovative behavior in the workplace.

Customer Capital and Innovative Behavior

Customer capital implies that companies can attain value from good relationships with outsiders, such as customers, suppliers, and others surrounding them, by utilizing, transforming, and integrating outsiders' knowledge (Curado, 2008; Lee, 2011; Ramezan, 2011). Lee (2011) summarized three dimensions of customer capital according to previous studies, which are attachment, depth, and breadth of the relationship. Relationship attachment refers to the degree of emotional and proprietary relationships developed through social interaction between partners; this relationship can result in loyalty and commitment (Lee, 2011). When there is a high level of commitment among associated parties, a higher level of trust will be produced; thus, they are willing to fulfill mutual responsibilities for the purpose of maintaining their particular relationships. Sidharta et al. (2019) concluded that customer capital emphasizes how to attain the trust of customers. For instance, Koufteros, Cheng, and Lai (2007) stated that a manufacturing firm can improve its existing knowledge base by collecting more expert skills and technical information from committed suppliers, thereby improving its current goods. Another dimension of customer capital, depth of relationship refers to the degree to which associated partners get involved in a project (Lee, 2011). External partners who get involved in a project tend to play an important role in innovation. For instance, suppliers usually have a better understanding of specialized information and technical expertise than their customers, so they can offer valuable methods to improve a product or process (Koufteros et al., 2007). The breadth of relationships, the last dimension of customer capital, refers to the number of relationships a company has with outsiders (Lee, 2011). Without a doubt, the more outsiders a firm can develop relationships with, the more knowledge and information it will get back in return. In addition, knowledge and information are important antecedents for organizational innovative behaviors. Therefore, owning a higher level of customer capital positively impacts employees' innovative behaviors.

Hence, the last hypothesis is proposed as follows:

H3: Customer capital has a positive effect on employees' innovative behavior in the workplace.

Methods

Sample and Data Collection

The study population of this research was service-oriented companies in Thailand. The Stock Exchange of Thailand (SET) claimed companies running in services, excluding financial services, and information or technology services, or other specialized services already classified, belong to the services industry group. A purposive sampling method was used to define the sampling frame because this method focuses on particular characteristics

of a population that will best answer the research questions (Rai & Thapa, 2015); thus, certain criteria for selection were provided. First, the company must be publicly traded on the SET because public companies are requested to publish annual reports and other documents. Second, the scope of the selected service-oriented companies must fit the standard for academics and scholars, so the scope of services should follow the definition proposed by the General Agreement on Trade in Services (GATS) of Thailand. Lastly, the companies with the business of producing materials and tangible products were excluded since this study focuses on evaluating the intangible resources. As a consequence, the sampling frame encompasses 289 listed companies in the service industry in Thailand, which includes three industry groups. It represents a total of 10 sectors from the Stock Exchange of Thailand (SET), and the Market for Alternative Investment (MAI). Because the focus of this study is at the organizational level, respondents were managerial level employees. HR managers of each company were reached and asked for assistance to distribute a self-administered questionnaire survey to other managers in their organizations. Of the 289 listed companies, 482 managerial officers from 199 companies returned completed surveys. Of this amount, 423 responses from 198 companies were valid, which accounts for a 68.51 percent response rate at the organizational level. However, the respondent rate at the individual level cannot be specified because it relied on the internal distribution of surveys through HR departments. In addition to the survey, the statics at end of 2019 of ROA, ROE, and market capitalization were collected from SET and MAI. They were also double-checked using each company's official website.

Table 1 summarizes the descriptive data of the organization's information. The average of established years for public companies in this study was 34.77 years, and most companies had more than 100 employees (76.4%). The mean of ROA and ROE for service-oriented public companies in the year 2019 was 5.25% and 14.85%. The average market capitalization was 34,479.596 million Baht (approximately 1131.278 million U.S. Dollar).

Table 1 Organizational Characteristics

Variables	Descriptive Statistics
Firm age (in the year, till 2019)	Mean: 34.77 yeas SD: 18.438
Firm size	Less than 50: 44 companies (10.4%) Between 50 to 99: 56 companies (13.2%) 100 and more: 323 companies (76.4%)
ROA	Mean: 5.25% SD: 11.199
ROE	Mean: 14.85% SD: 184.279
Market Capitalization	Mean: 34,479.596 million Baht SD: 111,628.148

Measures

All the scales utilized in this study were adapted from prior studies to examine the research model and hypotheses. Human capital, structural capital, and customer capital were measured using 14 items adapted from a questionnaire presented by Cassol, Gonçalo, and Ruas (2016). All of the items were measured along a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). In addition, the measurement of innovative behavior consisted of 9 items adopted from a study by Janssen (2001). A five-point Likert scale ranging from 1 (never) to 5 (always) was applied to measure these items. Since the population was in Thailand and the original language of the adapted questionnaire was English, a back-translation method was applied, and the first draft of the survey was sent to 10 managers from other industries. The reliability of each variable was tested through Cronbach Alphas (α) Coefficient, and the results were over the threshold of 0.7, presenting a good reliability.

In addition to the main independent variables, the author controlled for the organizational characteristics that can influence employees' innovative behavior in the workplace. Control variables involve organizational size (measured by the number of full-time employees: 1=less than 50; 2=between 50-99; 3=100 and more); organization's age (measure by its established years, counted till 2019); ROA and ROE (measured by

percentage in the year of 2019); and market capitalization (measured by million Baht in the year of 2019).

Statistical Analysis

Multiple linear regression (MLR) and hierarchical multiple regression analyses were used to examine the research model and proposed hypotheses. MLR is one method used to estimate and predict and enables researchers to analyze the relationships among variables. The major benefit of hierarchical multiple regression analysis allows researchers to cumulatively input independent variables according to a certain specific hierarchical structure. The analyses were performed using IBM SPSS statistics 23. Partial least Squares Structural Equation Modeling (PLS-SEM) was used to test the reliability and validity of the construct. The reason that using PLS-SEM is because it can deliver latent variable scores along with less stringent assumptions related to the variables' distribution and error terms (Henseler, Ringle & Sinkovics, 2009).

Results

Because the questionnaire was adapted from previous studies (Cassol et al., 2016; Janssen, 2001), PLS was used to measure both reliability and validity of the constructs in order to confirm that the questionnaire fit the Thailand context. Firstly, indicator reliability was tested using factor loadings; the results showed one factor loading value of the reverse coded item of human capital ("If a key employee leaves the company there will be losses") was low, so this item was removed, and human capital was reduced to a four-item scale. The revised constructs were tested again; the significance of each indicator was tested using bootstrapping (5000 times). The results showed that all factor loading of indicators were higher than 0.7 and significant at the 0.05 level, confirming indicator reliability (Hair, Black, Babin, Anderson & Tatham, 2006). Secondly, the findings from cross-loadings illustrated that each indicator has a higher load on its designated structure than any other structure, which confirmed the discriminant validity (Majchrzak, Beath, Lim, & Chin, 2005). Next, the revised model's internal consistency reliability and convergent validity were measured, their results are illustrated in Table 2. Based on the findings of Table 2, the reliability of all the constructs was adequate because their Cronbach's alpha values were higher than 0.7 (Majchrzak et al., 2005); all the constructs were desirable for research because their value of composite reliability (CR) were higher than 0.7 (Thatcher, & Perrewe, 2002); the value average variance extracted (AVE) were greater than 0.5, confirming satisfactory convergent validity (Fornell & Larcker, 1981). Lastly, according to Table 2, the square root of the AVE for each construct exceeds its correlation with any other construct (Fornell & Larcker, 1981); moreover, the value of HTMT of correlations were lower than 0.9 (Hosen, Ogbeibu, Giridharan, Cham, Lim, & Paul, 2021). Therefore, discriminant validity was satisfactory.

Table 2 Reliability and Validity of the Constructs

Constructs	Cronbach's α	Composite Reliability (CR)	AVE	Correlation of Constructs and Heterotrait-Monotrait Ratio (HTMT)			
				HC	SC	CC	INN.B
HC	0.772	0.852	0.592	**0.769**			
SC	0.893	0.921	0.702	0.729 (0.863)	**0.838**		
CC	0.862	0.906	0.709	0.667 (0.808)	0.766 (0.868)	**0.842**	
INN.B	0.947	0.955	0.705	0.473 (0.537)	0.530 (0.570)	0.460 (0.502)	**0.839**

Notes: Square root of AVE is presented in parentheses. Values within () are HTMT value. HC=human capital, SC=structural capital, CC=customers capital, INN.B=innovative behavior

Table 3 presents the results of correlation among variables. Pearson correlation coefficients were used for analyzing bivariate correlations among variables for a purpose of exploring the one-on-one relationships among variables. The value of the Pearson correlation coefficients of human capital, structural capital, and customer capital on innovative behavior were 0.459, 0.525, and 0.453 respectively, in addition to the significant value were less than 0.01, which indicates the correlation is highly significantly positive.

Table 3 Correlation Analysis

Variab-les	SC	CC	INN.B	AGE	SIZE	ROA	ROE	Market Capital
HC	0.719**	0.661**	0.459**	0.011	-0.013	0.007	-0.047	0.098*
SC		0.763**	0.525**	0.080	0.020	-0.071	-0.132**	0.120*
CC			0.453**	0.069	0.022	0.008	-0.133**	0.112*
INN.B				-0.005	0.027	-0.057	-0.121*	-0.036
AGE					0.249**	-0.087	0.026	0.139**
SIZE						0.146**	0.019	0.144**
ROA							0.294**	0.062
ROE								0.006

Notes: **p<0.001, *p<0.05 (2-tailed). HC=human capital, SC=structural capital, CC=customers capital, INN.B=innovative behavior, Age= firm's age, Size= firm's size, ROA= return on asset, ROE=return on equity, Market Capital=market capitalization

MLR and hierarchical multiple regression analyses were used to test the construct models as illustrated in Table 4. The variance inflation factor (VIF) was also evaluated to check for any possible multi-collinearity problems among all variables in each equation. The maximum VIF is 2.597, which indicated that there were no problems of multi-collinearity among the indicators (Hair, Risher, Sarstedt, & Ringle, 2019). According to Table 3, Model 1 reports the results of Hypothesis 1 involving control variables, and the result supports a statistically significant and positive relationship between human capital and innovative behavior ($\beta = 0.572$; $p<0.001$). Model 2 shows the results of Hypothesis 2 including control variables, and it shows a statistically significant and positive relationship between structural capital and innovative behavior ($\beta = 0.620$; $p<0.001$). Model 3 represents the results of Hypothesis 3 including control variables, and a statistically significant and positive relationship among customer capital and innovative behavior is illustrated ($\beta = 0.533$; $p<0.001$). In addition to the base equations, Model 4 and Model 5 were tested through hierarchical multiple regression analysis, which including human capital, structural capital, and control variables in Model 4, and all elements of intellectual capital (human, structural, and customer capital) with control variables in Model 5. The increase in the R^2 suggests that multiple elements of intellectual capital have better explanations for the outcome variable than a single element of intellectual capital. However, the relationship between human capital and innovative behavior in both Model 4 and Model 5 were less significant than it individually impacts innovative behavior; besides, the relationship between customer capital and innovative behavior was positive but not statistically supported. Overall, the final model still supports Hypothesis 1 ($\beta = 0.194$; $p<0.05$) and Hypothesis 2 ($\beta = 0.409$; $p<0.001$), but no longer support Hypothesis 3 ($\beta = 0.103$; $p<0.150$). It is worth noting that structural capital has the highest coefficient among all models, and it was statistically supported. This indicates that structural capital plays the most important role in employees' innovative behaviors among three elements of intellectual capital. Among the three base models, the R^2 of Model 2 suggests that structural capital explains the outcome variable, employees' innovative behavior, better than the others.

Overall, the highest R^2 was 0.309 from Model 5, which was considered as weak explanatory power in the regression model based on the guideline of considering 0.75, 0.50, and 0.25 as substantial, moderate and weak (Hair et al., 2019). However, acceptable R^2 values should be relied on the research context and R^2 value as low as 0.10 is also viewed as satisfactory in some disciplines (Hair et al., 2019), for instance, when investigating

employees' behaviors (Saleh, Piaw, & Idris, 2015). Thus, even though R^2 was low, it is still satisfactory. Table 4 and Figure 1 illustrates the results of hypotheses test.

Table 4 Results from MLR and Hierarchical Multiple Regression Analyses

Independent Variables	Dependent Variable: Innovative Behavior				
	Model 1	**Model 2**	**Model 3**	**Model 4**	**Model 5**
Human Capital	0.572***	-	-	0.219**	0.194*
Structural Capital	-	0.620***	-	0.469***	0.409***
Customer Capital	-	-	0.533***	-	0.103
Control variables					
Firm age	-0.001	-0.002	-0.002	-0.002	-0.002
Firm size	0.066	0.052	0.056	0.058	0.058
ROA	-0.003	-0.001	-0.004	-0.001	-0.002
ROE	0.000	0.000	0.000	0.000	0.000
Market Capitalization	-0.000	-0.000*	-0.000	-0.000*	-0.000*
R^2	0.230	0.291	0.221	0.306	0.309
Adjusted R^2	0.219	0.280	0.209	0.294	0.295
Maximum VIF	1.146	1.147	1.148	2.154	2.597
F statistics	20.745***	28.395***	19.635***	26.095***	23.105***

Notes: ***p<0.001, **p<0.001, *p<0.05. Standardized coefficients are reported.

Table 4 Summary of the Hypothesis Test Result

Hypothesis	**Hypothesis Test Result**
H1: Human capital has a positive effect on employees' innovative behavior in the workplace.	Supported
H2: Structural capital has a positive effect on employees' innovative behavior in the workplace.	Supported
H3: Customer capital has a positive effect on employees' innovative behavior in the workplace.	Supported

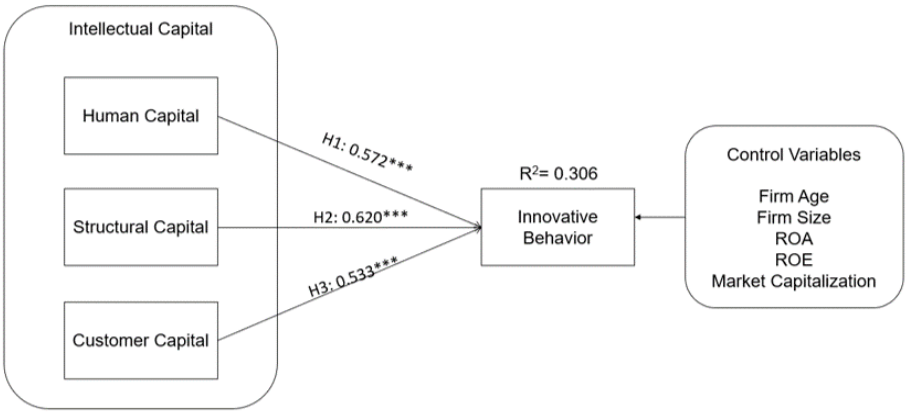

Figure 1 The Relationship between Elements of Intellectual Capital and Innovative Behavior

Discussion

This study explored the association between the elements of intellectual capital (human, structural, and customer capital) and employees' innovative behavior in the workplace. The results from the regression analyses supported all proposed hypotheses. First of all, the analysis presented that an organization with a high level of human capital tended to have better innovative behaviors in the workplace. In particular, the finding related to the positive contribution of organizational human capital and offers additional support to previous studies, which found that human capital can increase a firm's employees innovative work behaviors (Alpkan et al., 2010; Chou et al., 2018; Cingöz & Akdoğan, 2011). In service-oriented firms, knowledge-based resources are more important than tangible resources; thus, human capital is an important resource that includes employees' tacit knowledge and experience that can produce sources or strategies of innovation for a firm surviving in the dynamic business environment. This finding is also consistent with resource-based theory (RBT), which indicates that valuable, rare, difficult to imitate, and non-substitutable resources can help a firm to reach a sustainable competitive advantage (Barney, 1991). Employees' tacit knowledge and experience hold these characters, enabling a firm to develop new knowledge and unique innovative strategies.

Furthermore, the analysis indicated that a firm with a supportive working environment tended to positively impact employees' innovative work behaviors. This illustrates that the presence of structural capital enhances employees' ability to innovate. This finding is in line with the recent empirical study of Sidharta et al. (2019), which found the positive contribution of structural capital to the employees' innovative behavior. Structural capital is the most independent and steady element of intellectual capital possessed separately by organizations, not employees or individuals. By owning a higher extent of

structural capital, it means the firm has better storage of codified knowledge, accessible information, low transaction time, and a supportive culture (AlQershi et al., 2021). Therefore, it strengthens the employees' innovative behavior in the workplace. While a previous study conducted by Chou et al. (2018) that generated an inconsistent result in terms of the organizational capital on innovative behavior, this study presented a positive and significant relationship among structural capital and employees' innovative behavior.

Last but not the least, there was a customer capital effect on employees' innovative behavior. The analysis presented in this study suggested that a firm with a number of external relationships, such as customers and suppliers, tended to increase employees' innovative behavior in the workplace. This is in line with social capital theory, which indicates that relationships within the workplace can bring a cluster of social resources to an actor (Adler & Kwon, 2002). In service-oriented companies, feedback from customers is essential since they can provide a piece of faster information for corporate employees to know the qualification of their services and then improve upon these services. To fulfill customers' needs and wants, a strong effort from employees is required (Sidharta et al., 2019). For instance, employees are encouraged to search for solutions to fill customer's needs, which leads to their innovative behavior in the workplace. This finding is consistent with a study conducted in Taiwan by Chou et al. (2018), that showed that customer capital has positive effects on employees' innovative work behavior; customer capital was found as the most important element of intellectual capital that impacted employees' innovative work behavior in their study.

Research limitations and directions for future research

Despite the supportive findings that this study offers, the author needs to review some research limitations. On one hand, the R^2 value was low in this study. The reason for this might be that cross-sectional data was used to perform statistical analysis, which means the interpretation of the findings can only be captured in terms of assumption approval at a specific period. Sanchez and Maroney (2015) stated that the R^2 of cross-sectional data is much lower than time series data. Hence, Future research may collect longitudinal data to predict the patterns of a variable over time. On the other hand, the data applied in the analysis were collected from a self-administered survey only by managerial officers, which can be sensitive to subjective bias. Thus, the future study may distribute the questionnaire to organizational employees as well to explore their responses.

Theoretical and practical implications

The path of intellectual capital to innovative work is based on RBT. The findings in this study support that RBT not only works as a main theoretical foundation in the scholarly literature but also noticeably recognized in the field of strategic management by addressing a

fundamental issue of intangible resources that can be created and accumulated for firms in a dynamic business environment.

The main findings of this study also offer numerous practical contributions for organizational managers, leaders, and employees, especially in the listed companies of the service industry. The job characteristics showed that service-oriented companies rely on intangible resources rather than tangible resources. In particular, as suggested by the results of this study, human capital seems to be an essential factor to strengthen organizational employees' innovative behavior in the workplace. Since personnel are a key factor in a firm, managers should hire knowledgeable or skillful employees initially. To achieve that, organizations may need to revise recruitment processes. However, it is impossible to hire the right person for the company all the time, so managers should have a long-term training plan to improve the capabilities of employees, especially in the service industry, which requests faster and effective feedback for fulfilling customers' needs and wants. In addition to human capital, the findings of this study suggest managers have an emphasis on organizational structural capital. Organizational structure is a non-human asset of a firm that not only promotes a firm's work, but also may prevent the business running effectively if it creates communication barriers and a lack of collaboration, such as a hierarchical organizational structure. A working environment can empower employees and enhance their sense of belonging, connection, and security, so organizational members are motivated to work. Consequently, when a business struggles, managers should not only inspect problems from their subordinates, but also check if the organization's policies, norms, or structures prevent the execution of business. Last, the results of the study also found that intangible assets can be accumulated from corporate reputation and relationships with outsiders such as customers and suppliers. Customer capital, thus, should also be valued in a firm. To generate a reputation from both customers and suppliers, managers should train and retain employees to assist customers with a sale, problem, or query, and to keep a commitment with suppliers for long-term cooperation.

Conclusion

In summary, this study has offered empirical evidence to support the important effects of organizational intellectual capital (human, structural, and customer capital) on employees' innovative behavior in service-oriented and public companies in Thailand. To be more precise, personnel is a core aspect of human capital as well as the key component to innovation in organizations; thus, owning a greater level of human capital can definitely enhance employees' innovative behavior in the workplace. A high extent of structural capital in an organization represents a supportive working environment, thereby having positive impacts on innovative behaviors of employees. Furthermore, the external relationships mean the ability of gathering information, so employees present higher degree of innovative

behavior at firms with greater levels of customer capital. In general, these findings provide an additional contribution to the prior studies that proposed the positive attribution of intellectual capital towards employees' innovative work behavior. The study also filled the research gap by exploring the importance of intellectual capital on innovative behavior in the service industry. Lastly, as more and more firms have realized the importance of intangible resources in surviving in the dynamic and competitive business environment, the author suggests that it is very important for firms, especially service-oriented firms, to recruit skilled employees to accumulate the human capital, to inspect their organization's working systems for improving the structural capital, and to maintain good relationships with customers and supplier for enhancing the customer capital, to improve their employees' innovative behavior in the workplace, thereby enhancing their business performance.

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