

The Role of Structural Empowerment and Innovative Behavior in Defining Business Process Innovation and Competitive Advantage to Cope with Industry 4.0

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ABSTRACT

Researches about the impact of innovation towards competitive advantage have been widely discussed. One of the relevant innovation variables is business process innovation. Innovation does not suddenly appear within an organization. Some supporting factors are required, such as a climate that supports innovation and structural empowerment. Discussing further about structural empowerment, some studies specifically tested its effect towards innovative behavior. Connecting the dots, the relationship between structural empowerment and organizational performance has also been observed. In the current industrial context, companies are demanded to be more agile and creative in facing fierce and fast market competition. Furthermore, industry 4.0 trends also bring many changes to the pattern of competition in the market. Companies must be able to adapt to the new processes regardless of the industry. Structural empowerment is one of the most important things that is needed to improve organizational efficiency and problem solving agility. This study examines the relationships between structural empowerment, innovative behavior and business process innovation, which ultimately leads to the level of competitive advantage of an organization. It connects the theories of structural empowerment and innovation, which have always been seen as something separated in regards to its influence towards competitive advantage. In conducting the empirical test, data from 66 managers or team leaders were taken through an online survey. Partial Least Squares (PLS) method was used to see the relationships that occur between constructs. The result shows a positive influence between structural empowerment, innovative behavior, business process innovation, and competitive advantage.

Keywords: *Structural Empowerment, Business Process Innovation, Competitive Advantage, Industry 4.0*

1. INTRODUCTION

Competitive advantage from the perspective of resource-based view [1], stated that sustained competitive advantage is obtained through the mobilization of existing resources in an organization. This theory assumes that resources are not evenly distributed among the players within a market. Daft mentioned that an organization's resources consist of various aspects, including assets, capabilities, organizational processes, information, and knowledge [1]. These resources are mobilized to increase organization efficiency and effectiveness. Discussing specifically about the organizational processes, Anning-Dorson [2] has linked this theory with the empirical test which proved a positive relationship between business process innovation and competitive advantage. Separately, Singh and Sarkar [3] have also studied the

relation between innovation and structural empowerment, but from the perspective of innovative behavior. Considering that Garcia-Juan et al. [4] has also connected structural empowerment with organizational performance, which is very relevant with the competitive advantage, this gap is further examined in the study.

According to the American Society for Quality [5], empowerment within an organization could be done by giving employees a certain degree of control and autonomy to do their daily job activities. This can be translated into several activities, such as involvement in developing organizational processes, helping to create and manage new systems and strategies, and establishing delegation of authority for employees to run smaller departments with less supervision from middle or top level management. Some of the employee

empowerment advantages based on Leonard [6] are better accountability when making decisions, problem solving acceleration, better customer service quality, job satisfaction improvement and efficiency of organizational processes.

The study about empowerment itself was built from a motivational framework of the work characteristic model from Hackman and Oldham and the concept of self-efficacy from Bandura [7]. Furthermore, based on the analysis of Maynard et al. [7], empowerment could be observed from two main points of views: social-structural and psychological. The social-structural perspective looks at empowerment through a focus on a set of formal organizational controls. According to Kanter, by sharing a certain degree of authority through the empowerment of others, a leader's strength will grow and as a result, increment of the overall organizational performance will be realized [8]. On the other hand, the psychological perspective focuses on employee perception or cognitive state about empowerment.

Discussing about the context of the research, this paper is focusing more on Industry 4.0. In this digital era, companies are required to be more adaptive and efficient in responding to the development of a very dynamic environment. Many digital-based start-up companies have sprung up and aggressively seized market share in various industries. Therefore, a breakthrough is needed to improve company performance in order to survive in a fast and tight business competition environment. Barney's theory [1] is very relevant with this context as he mentioned that a sustained competitive advantage cannot be removed simply by the duplication of benefits. Connecting the fundamentals of resource based view, the benefits of structural empowerment and the gap of previous studies, this research examines the effect of structural empowerment towards innovative behavior, business process innovation, and ultimately competitive advantage in Industry 4.0.

2. LITERATURE REVIEW

2.1. Competitive Advantage

According to the Corporate Finance Institute [9], competitive advantage is an attribute that enables an organization to outperform its competitors. It allows organizations to achieve a better margin and generate value for the company and its shareholders. Competitive advantage must be unique and difficult to imitate. If an organization's strengths are easily copied or imitated, then it cannot be categorized as a competitive advantage. Some examples of competitive advantage are access to resources that are limited and not owned by competitors, a highly skilled workforce, unique geographical location, access to new or exclusive

technology, the ability to produce certain products at a lower cost, and a well-known product brand.

The survival of an organization is very dependent on its ability to gain competitive advantage through innovation that requires flexibility, adaptability and good responsiveness [2]. Furthermore, Helfat *et al.* [2] said that the tendency of organizations to innovate is a type of dynamic ability that contributes to competitive advantage. Amit and Shoemaker [2] argued that an organization's ability to transform resources into something that is relatively unique and inimitable will produce strategic assets. Organizations that want to gain competitive advantage will implement strategies that exploit existing internal strengths and external opportunities [2].

In this study, competitive advantage from the team level is specifically analysed. Competitive advantages are usually observed at the firm level. However, the attributes measured in this research are specifically tailored to focus more on the product and service quality. The measurement items used are based on Safari et al. [10] and Anning-Dorson [2]. Thus, the unit of analysis can be further passed down to the teams or divisions level that are related to the product and service performance.

2.2. Process Innovation

According to Damanpour, process innovation can be done by creating and improving production methods, also adopting new elements (raw materials, task specifications, information flow and equipment) into the production processes [2]. In the service sector, the level of service process innovation is seen from the extent to which the organization develops a service system to improve its performance.

2.3. Innovative Behavior

According to Yuan & Marquardt [11], the effect of innovation towards the success of organization is generally accepted. Innovative behavior includes some practical actions, such as the introduction and implementation of new ideas, processes, procedures, and products to one's role, work division, or organization. Both individual organizational members and groups of individuals in an organization could actively pursue this behavior to impact their surroundings. Compared to creativity, the concept of innovative behavior is broader and more systemic since it covers not only the generation of new ideas, but also the promotion and implementation part. The management studies about innovative behavior mainly focus on the human aspect, not technical. Therefore, some related theories of psychology and sociology are closely used to analyse the factors that affect individual and group innovative behavior levels.

A large number of studies have focused on identifying factors that can encourage and enable employees to show innovative behavior in the workplace. Some of the topics that are often being studied include individual motivation, influence, and characteristics, as well as contextual antecedents such as leadership, organizational culture, social relations, and job characteristics. Innovative behavior can also exist at the team level, which leads to the research of team innovation. The study of team innovation explains innovative behavior and the processes, which are very dependent on the team environment condition. In addition, studying innovative behaviors across cultures provides important knowledge in the global economy era, where diversity is really promoted and interactions across environments are inevitable.

2.4. Empowerment

The study about empowerment was initially developed from a motivational framework of the work characteristic model from Hackman and Oldham and the concept of self-efficacy from Bandura [7]. From Kanter's original work, preliminary studies explain how empowerment is shown through organization formal structures and practices. Furthermore, based on the analysis of Maynard et al. [7], empowerment could be observed from two main points of views: social-structural and psychological. The social-structural perspective sees empowerment through a focus on a set of formal organizational controls, such as aspects of work, organizational arrangements, or team design that instil procedures, policies, and situations [7]. This control decentralizes power and transfers responsibility to employees in the decision making process.

On the other hand, a psychological perspective, which was firstly introduced by Conger and Kanungo and connected with Bandura [7] about self-efficacy, is focusing more on employee perception or cognitive state about empowerment. Based on Thomas and Velthouse, Spreitzer develops multidimensional cognitive factors, namely choice, meaning, impact, and competence as motivators of intrinsic task motivation [7]. Together, these four dimensions reflect a proactive orientation towards one's job role.

2.5. Structural Empowerment

Kanter's structural empowerment theory is more focused on the structure in organizations rather than the quality of the individual itself [8]. According to Kanter, by sharing a certain degree of authority through the empowerment of others, a leader's strength will grow and as a result, increment of the overall organizational performance will be realized [8]. In addition, Kanter argues that by combining adequate tools, support and information, people's base skills will be increased. They

will tend to make more right decisions and achieve overall, resulting in the benefit of organization [8].

Kanter stated that there are two origins of systemic strength that exist within organizations, namely formal and informal forces. Formal force is the strength that accompanies work with the main focus on individual decision making, it is highly visible. On the other hand, informal force is coming from relationships, engagement and alliances with colleagues [8].

There are six aspects needed to further support empowerment according to Kanter, including opportunities to progress or develop, good access to information, resources, support, formal strength, and informal strength. These six conditions form the basis of much work and studies conducted by organizational behaviorists. The basis for structural empowerment and psychological empowerment comes from Kanter's work in the 1970s. They are identified as different sources of organizational strength [8].

3. RESEARCH METHODOLOGY

As explained above, this study examines the effect of structural empowerment on competitive advantage. Structural empowerment is tested as an indirect relationship effect through innovative behavior and process innovation as a mediating variable. The dimensions of structural empowerment consist of access to resources, access to information and development and recognition. Dimensions were taken from Singh & Sarkar [3] with context adjustments to make them suitable for the study. Furthermore, through the same reference, the innovative behavior variable itself has no dimension. This variable mediates structural empowerment and process innovation. Process innovation is tested as a variable that mediates innovative behavior and structural empowerment to competitive advantage. The measurement attributes of process innovation are taken from Anning-Dorson [2] and Jones & Linderman [12]. Finally, competitive advantage consists of 7 measurement items based on Safari et al. [10] and Anning-Dorson [2].

The following is conceptual model of the study in Figure 1:

3.1. Hypothesis Development

3.1.1. Effect of Structural Empowerment on Innovative Behavior

According to Kanter [13], structural empowerment is related to how a work environment can give employees access to information, resources, support, and opportunities to learn and develop. Kanter's empowerment theory is more focused on structure in organizations rather than the quality of the individual

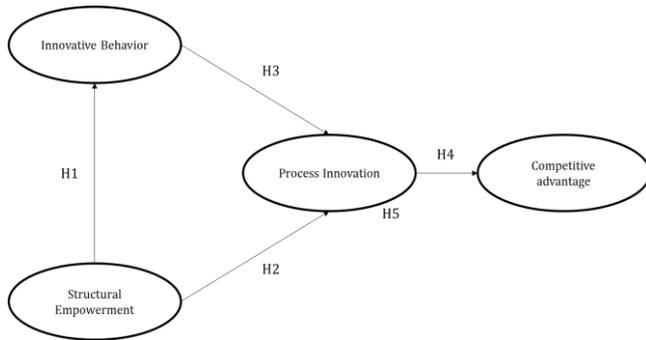


Figure 1 Conceptual research model

itself [8]. According to Singh and Sarkar [3], innovative behavior is the ability of employees to promote and search for new ideas and also seek ways to implement them. This plays an important role in ensuring the continued development of an organization. Innovative behavior can be carried out either by individual members or groups in an organization. Ripley & Ripley [3] mentioned that empowerment is the basic foundation of an innovative process. Innovative behavior requires allocation of funds and resources, important information, trained individuals, and availability of support infrastructure. Singh and Sarkar [3] have further supported this correlation in their study about the education sector in India. Based on the description above, the first hypothesis of this study is:

H1. Structural empowerment has a positive effect on innovative behavior.

3.1.2. Effect of Structural Empowerment on Process Innovation

Based on Kanter's theory [3] of structural strength, the four main dimensions of structural empowerment are good access to information, access to resources, personal or career development, recognition and work environment. Access to resources can be described from the level of availability of material or references that can be used by employees to carry out daily tasks. Dewar and Dutton [3] have further stated that a better access to resources can lead to better know-how and implementation of new ideas. Furthermore, access to information shows the extent to which information can be transferred to members of the organization properly. This access is not only limited to the daily information, but also includes a broader and more important information for employees carrying out their tasks. A better flow of internal information will increase the exchangeability and survival rate of new ideas [3]. The second hypothesis developed in the study is:

H2. Structural empowerment has a positive effect on business process innovation.

3.1.3. Effect of Innovative Behavior on Process Innovation

The relationship between innovative behavior and process innovation has not been much studied in previous research. In fact, there is no empirical study that states the positive connection between these two variables. However, Yuan & Marquardt [11] explained that innovative behavior refers to the creation and application of new ideas, products, processes and procedures to one's work role, work unit, or organization. In regards to the mediating role of innovative behavior, Ripley and Ripley [3] linked the relationship between empowerment and innovative process. Therefore, this study explores the research gap found and incorporate it into one of the hypothesis:

H3. Innovative behavior has a positive effect on business process innovation.

3.1.4. Effect of Process Innovation on Competitive Advantage

The competition in the market that is getting intensive and fast requires companies to continuously be innovative in creating new advantages. In addition, Atuahene-Gima [2] said that innovation enables companies to be more flexible and adaptive to the changing environmental conditions. In the service sector, innovation is considered as one of the strategic tools needed to maintain the level of competitiveness and relevance. Innovation is also seen as an important factor needed to improve competitiveness in a modern business environment characterized by hyper competition. The survival of a company is very dependent on the ability to gain competitive advantage through innovation that requires flexibility, adaptability and responsiveness. Furthermore, it is said that the tendency of organizations to innovate is a type of dynamic ability that contributes to competitive advantage [2].

In correlation with structural empowerment, Kanter believes that the strength of an organization's leaders will increase when that power is also shared through employee empowerment and as a result, leaders will find improvement in organizational performance [8]. In addition, Kanter believes that with adequate tools, information and support, one's skill base will increase. Employees will make decisions based on appropriate information, so that it benefits the organization as a whole [8]. Barney [1] also explained the importance of utilizing organizational resources, which is closely related with structural empowerment, in achieving sustained competitive advantage. Furthermore, according to Daft [1], the organizational process is classified as an important part of company resources. The last hypothesis that are synthesized from the literature review:

H4. Business process innovation has a positive effect on competitive advantage.

H5. Business process innovation mediates the relationship between structural empowerment and innovative behavior on competitive advantage.

3.2. Research Design

This research is based on quantitative methods by taking data in the form of distributing surveys to get the desired information. In determining the number of samples, Hair et al. [14] suggested a 10 times rule of thumb. It should be 10 times larger than the number of formative indicators or structural paths. Sideridis, Simos, Papanicolaou, and Fletcher [15] also strengthen the justification by stating that a sample size of 50-70 would be enough for a model of functional brain connectivity involving 4 latent variables. Taking data from 66 respondents, the rule of thumb is statistically fulfilled in this study. The collected sample was used to test the five hypotheses with the PLS statistical method. Finally, this study is examining the relationship between the variables of structural empowerment, innovative behavior, process innovation and competitive advantage.

3.3. Sample Framing

The research focuses on the context of Industry 4.0 in Indonesia, which is relevant with the current business trend and development, despite the industry type. As mentioned by Cotteleer & Sniderman [16] in their article, Industry 4.0 could significantly shift employees' work process and target. The rapid development of smart automation and internet of things do not only integrate the previously scattered systems, but also affect the changes in organization expectation, employee's skills set requirement, and even the roles needed itself. Other than that, Deloitte [17] also stresses the launch of new services and process innovations or other innovative solutions as one of the future trends in the digitized industry, which is in line with the variables that are examined. Furthermore, the unit of analysis scope is limited to the team or unit level. The study analysed samples from various industries, but limited to the divisions that are related to product and service deliverables. The specific sample is chosen to match the criteria of competitive advantage that are observed and measured according to [10] and [2]. In this case, they are closely related with the team process improvement to generate better products or services.

3.4. Measurement Instruments

Structural empowerment is an independent variable in this study. The effect of structural empowerment is analysed on the innovative behavior and process innovation variables. In addition, the relationship

between innovative behavior and process innovation is also observed. The dependent variable in this study is competitive advantage. Process innovation itself acts as a mediating variable between structural empowerment and innovative behavior towards competitive advantage. The measurement items were taken from several sources, namely structural empowerment and innovative behavior [3], business process innovation [2], [12], and competitive advantage [10], [2]. Taking the items from various sources, the Likert scale and definition are harmonized to avoid respondents confusion (7 Likert scales: 1 = strongly disagree; 7 = strongly agree). Finally, 29 measurement items were used in the study.

3.5. Control Variables

In conducting the study, several variables are controlled to enhance the validity and reliability of the result, such as demographic variables (gender and age), and working experience. For business sectors, the effect of variables has been neutralized through the supporting theory of Industry 4.0 context. Regardless of the sectors, the digitalized era has pushed organizations to be more innovative and agile to survive in the environment. This includes agility in technology adoption, utilization and implementation.

4. RESULTS

From the 78 preliminary data obtained, 12 of them cannot be analysed. This is based on the eligibility questions that filter the respondents if they are not leading the related division, team, or unit observed. Furthermore, data was taken between the periods of June - July 2020. Respondents consisted of 68.2% men and 31.8% women. The age range of respondents are dominated by ages between 21-30 years (71.2%) and 31-40 years (22.7%). Respondents are coming from several industries, dominated by the service sector (30.3%), IT or e-commerce (21.2%), and supply chain (9.1%). The divisions led by respondents are mostly product or service development (36.4%), sales (10.6%), and supply chain (10.6%). Most of the respondents have led their team for about 1-5 years (89.4%) and 6-10 years (7.6%).

PLS method is used to analyse the result. To test the validity and reliability of the construct, this study is referring to the values of construct reliability (CR) > 0.7, average variance extracted (AVE) > 0.5, and factor loading > 0.5 [18]. Furthermore using the SmartPLS program, the loading factor and t-statistics values are generated. Based on the construct validity and reliability test, sufficient values are obtained. It could be indicated from all the AVE values, which are greater than 0.5 and CR values being greater than 0.7. For loading factor values, almost all of them are greater than 0.5, except for the relationship between structural empowerment,

innovative behavior and process innovation. Furthermore, all of the loading factor values are positive, this shows a positive relationship between each construct. Even though we could see that the effect of structural empowerment is not really strong towards innovative behavior and process innovation, the t-statistics values show that all the relationships between constructs are statistically significant (> 1.96). Therefore, all of the null hypotheses in this study could be rejected. The results are in line with previous studies, especially in regards to the connectivity of structural empowerment towards innovation [3] and relationship between process innovation and competitive advantage [2].

5. DISCUSSION AND CONCLUSION

Building from Barney's RBV theory [1], the study has further elaborate the meaning of organizational resources utilization in order to achieve competitive advantage. The analysis built from the innovation angle [2], [3], provides an interesting perspective on the importance of this variable to be embedded in an organizational process. The empirical test conducted shows the relationship between structural empowerment and innovation which has always been considered as a separate thing in influencing competitive advantage. Furthermore, the competitive advantage attributes measured in this research are specifically tailored to focus more on the product and service quality aspect [2], [10], which is relevant to be observed from team level.

In the context of Industry 4.0, intense and dynamic competition requires organizations to be more agile in adjusting with the rapid development. In this case, structural empowerment facilitates the utilization of organizational resources, especially in terms of organizational processes, to further innovate and achieve competitive advantage. Decentralization of power, which is related to structural empowerment, makes organizations more flexible and agile in innovating. Thus, increasing team adaptability to survive the extreme market condition.

In addition, there are some interesting findings that need to be highlighted from this empirical test. First, structural empowerment's most dominant dimension is access to information. It shows that in the current Industry 4.0 era, information is a very valuable resource. This is in line with the analysis of Cotteleer & Sniderman [16], which mentioned the transformation of information from linear to real time data as part of the important transition during Industry 4.0. Real time information provides more reliable data for organizations to act and adapt with the changes in order to achieve competitive advantage. For the innovative behavior variable, dominant measurement items are focusing more on the implementation of new ideas to

solve existing problems. In this case, support from managers or team leaders are also important to realize innovative behavior. Therefore, to achieve a better competitive advantage, it is very important for managers to provide their team with sufficient information to empower them while also monitoring the implementation of new ideas/ innovations generated from the empowerment. In summary, this research has contributed theoretically by observing the gap between structural empowerment and innovation variables in achieving competitive advantage, empirically by testing the relationship in Industry 4.0 context, and practically in terms of recommending the important factors to be supervised by managers based on the findings.

Even though this study has addressed the connections between structural empowerment, innovation and competitive advantage, there are still some rooms available for improvement. Highlighting the competitive advantage point of view, the scope of this variable in the study is quite focused on team performance to deliver a better product or service to customers. It will be good to explore this aspect in future studies to give a bigger picture of structural empowerment and innovation effect towards competitive advantage, e.g. financial performance.

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