ISSN 2964-5387 (online)
Vol 3, No 2, 2024

The Influence of Industry 4.0 and Firm's Level Characteristics Toward Business Model Innovation and Its Impact on Performance

Triyono Arief Wahyudi [a], Donant Alananto Iskandar [b*]
[a] Esa Unggul University, Indonesia, Triyono.arief@esaunggul.ac.id
[b*] Kalbis University, Indonesia, donant.uum@gmail.com

**Corresponding Author: Donant Alananto Iskandar, donant.uum@gmail.com*

Abstract

Globalization affects many companies in Indonesia. It causes increased global competition. These companies compete with others which are not only within industry. Therefore managers should have the valuable orientation in managing their resources to achieve the competitive advantage through creating innovation performance. This research offers entrepreneurial marketing as this valuable orientation. The objective is to analyze the effect of entrepreneurial marketing on managing resources and also to analyze the influence of managing resources on innovation performance. It is quantitative research which has a conceptual model consisting of three constructs. These were entrepreneurial marketing, managing resources and innovation performance. There are 2 hypotheses. The unit of analysis was the managerial level of manufacturing companies. The data is collected through distributed questionnaires. The collected questionnaire is 91 out of 215 distributed questionnaires. The data set is analyzed by using the SPSS (Statistical Package for the Social Sciences) for reliability test, validity test, normality test and hypothesis tests. The results are all hypotheses supported by the data. The contribution on theoretical manner is the empirical evident of the effect of entrepreneurial marketing on managing resources and also the effect of managing resources on innovation performance. The managerial implication of this research is the entrepreneur could creatively explore entrepreneurial marketing's elements which are proactiveness, opportunity focus, calculated risk taking, innovativeness, customer intensity, resource leveraging and value creation to manage resources for achieving the best innovation performance.

Keywords: entrepreneurial marketing; value creation; innovativeness; managing resources, innovation performance

I. Introduction

The fourth industrial revolution has come at recent time. It is a continuation of the third ones which is the digital revolution since the 1960s. It affects the change on any economic and business environment. Characteristics of technology, products and customers have changed faster than before. There are some emerging industries like application industry, e-commerce industry and e-products or e-service industry. Some industries are in the mature-decline phase on the industry life cycle. Those industries are printing industry, non-electronic publishing industry (books, newspapers, magazines, etc.), non-electronic music industry, game console industry and so on. While many multi-national companies which have had long history of existence closed their manufacture operation down in Indonesia such as Sony, Toshiba, Sharp, Ford etc. Some companies in the industries drop their business by decreasing number of their employees, working hours and/

Received 16 May 2024, Revised 9 August 2024, Accepted 16 August 2024, Available online 31 August 2024, Version of Record 31 August 2024.

ISSN 2964-5387 (online)
Vol 3, No 2, 2024

or closing their branches down. The others could survive in running their business. These companies can do innovation to achieve the best market position through competitive advantage. Innovation performance could be affected by the way of companies to manage their resources.

To achieve competitive advantage on market position, companies have to be adaptable, flexible and responsive on the business environmental changes. The changes have happen on many industrial sectors. These companies have managed their resources proportionally to strengthen their market position in achieving the best financial performance.

Therefore understanding market needs and wants would affect the way of companies to manage their resources. [1]Morris, Schindehutte, and LaForge describe a concept of entrepreneurial marketing (EM) which is the intersection between entrepreneurship and marketing. It contains proactiveness, opportunity focus, calculated risk taking, innovativeness, customer intensity, resources leveraging and value creation.

By using entrepreneurial marketing, the companies manage their resources in doing innovation process to achieve competitive advantage on the competition arena. The Objectives of this research are (1) to analyze the influence of industry 4.0 towards business model innovation, (2) to analyze the moderating effect of firm's level characteristics on the influence of industry 4.0 towards business model innovation, (3) to analyze the moderating effect of firm's level characteristics on the influence of business model innovation towards performance, and (4) to analyze the influence of business model innovation towards firm performance.

II. Theoretical Foundation and Hypothesis Development

This research used several theories and concepts to describe the foundation of research conceptual model. Several theories are provided. These are industry 4.0, firm's level characteristics, business model innovation, and firm's performance.

Industry 4.0

Industry 4.0 is a strategic initiative recently introduced by the German government. The goal of the initiative is transformation of industrial manufacturing through digitalization and exploitation of potentials of new technologies. An Industry 4.0 production system is thus flexible and enables individualized and customized products. The aim of this paper is to present and facilitate an understanding of Industry 4.0 concepts, its drivers, enablers, goals and limitations. Building blocks are described and smart factory concept is presented. A Reference Architecture Model RAMI4.0 and role of standardization in future implementation of Industry 4.0 concept are addressed. The current status of Industry 4.0 readiness of the German companies is presented and commented. Finally it is discussed if Industry 4.0 is really a disruptive concept or simply a natural incremental development of industrial production systems. [2]

Firm Level Characteristics

In the scenario today, managers must be able to organize multiple distribution channels, complex supply chains, rare technological resources, and yet remain flexible enough to shape the changing market. In this situation of increasing complexity, the business model theme has acquired importance as a way of explaining the functioning of an organization considering the components of its strategy, an accessible option to understand or manage a business by its main processes and routines [3] understanding is possible through logical representation of how value is delivered to the companies' customers. This broad view of a business is called a business model [4] Its construction allows identifying how a particular enterprise is implemented, how one can capture value from it and the structure necessary for this.By observing the influence of the business model in the strategic base of the company flexibility in technology changing environments and market [5], it is desirable to analyze how this relationship has been built and the changes designed over time. In this case, the concept of dynamic capacities is adapted to the role of analysis lens, in order to understand the behavior of the actors inherent in the process of changing business models [6] In this context,[7] argues that through the development of dynamic capabilities, it is possible to identify and reconfigure competencies that the company needs to act in an environment of constant change. Despite of

ISSN 2964-5387 (online)
Vol 3, No 2, 2024

the author's assertion, some practical questions remain about the connections between the concepts of dynamic capabilities and business models, that is, the positioning of dynamic capacities in relation to business models in a real case. In the theoretical scope, the answer to these questions can direct the study of these concepts and help understanding the boundaries between them. In the organizational sphere, this clarity can help in the process of innovation on business models, that is, in the constitution of methodologies or technical tools oriented to innovation in business models. Therefore, the purpose of this article is to understand how innovation has occurred in the business model and what routines have been essential in the search for the creation of the Bematech's values. The phenomenon is observed from the perspective of dynamic capacities.

Value Concept of A firm

In the field of strategic management, value has been used to explain the search for competitive advantages of organizations in two chains of thought: [8] and [9] However, there is still no common concept about value; [10] [8] in his perspective known as the Strategic Positioning Analysis (SPA), the essence of competitive advantage is the highest value customers are willing to pay in relation to the company manufacturing cost. According to Barney [9], and based on the concept of resource-based Vision (RBV), competitive advantage is achieved by a company when its value creation strategy cannot be easily copied by competitors. The work on dynamic capabilities commonly uses terms, such as value creation and value capture. It is known that the definition of value in the view of the dynamic capabilities is influenced by the [9] in which the value is related to valuable resources, rare, difficult to imitate or replace. However, it is perceived that the dynamic capabilities also relate the creation of value to high-level routines based on the entrepreneurial activity of identifying opportunities and resource mobilization, implementation of business models, [11]processes, leadership ability applied to these resources [6]. However, RBV lacks studies about the creation and capture of value for understanding the phenomenon in strategic management [12] In the search to fill these gaps, one option is to invoke other theoretical lenses such as the dynamic capabilities.

Value Creation and Value Capturing of A Firm

The ability to create value does not guarantee the persistent performance of the company's activity, since there are external to the company factors, such as competition, for example. For a long-term activity, the organization must be effective in creating and capturing value. This is because the created value may be different from the captured value, and often so is the company can create value but may fail to capture value. The literature shows that several authors indicate elements and processes they consider important in the creation of value in the organizational scope. [13], value creation comes not from a single enterprise resource, but from the integration of all organizational elements. When facing the same perspective, [14] point out that the relationships between organizational resources, whether tangible or intangible, are the central elements of the value creation process. According to [15], the capture of value depends on an architecture that combines strategies of entry, integration, cooperation and diversification with the organizational design in harmony with these strategies, that is, the creation of value from processes or routines of highlevel capabilities that enable organizations to review and develop capabilities for long-term value creation and capture. In this context, the creation of value handled in this work moves away from mathematical exchanges insofar as the value created is influenced by the processes of transformation, capacity to identify the opportunities and the clients' needs and the combination and transformation of resources [16] These key elements for creating and capturing value, as well as the role of the manager in creating the essential routines in value creation and capture processes, are addressed in the next section under the lens of dynamic capabilities.

Dynamic Capabilities

The vision of the dynamic capacities takes care of the adaptive aptitude of the firm in a dynamic environment [7] It is the organizational capacity to detect, integrate, learn and reconfigure its internal or external resource base, whether knowledge, skills or strategies, to adapt and respond to the demands of a constantly changing environment [17] developed the theme based on

ISSN 2964-5387 (online)
Vol 3, No 2, 2024

RBV. According to [9] and [18], organizational resources considered difficult to reproduce by other competitors, when used for value generation, can generate competitive advantages. The dynamic capabilities perspective has added the external component and importance of strategic capacity management, proposing greater flexibility to develop new capabilities for RBV, as well as renewing existing ones with the purpose to generate competitive advantages. Even though, the resources employed are scarce or difficult to replicate [19][17] [20] [11] In the same context, in a more recent approach, dynamic capabilities are determinant for the speed and degree to which companies align and realign their resources to meet the needs of the environment, as well as to seize the opportunities generating sustainability and advantages over to competitors [6]. In order for this to happen, the companies' actions should be focused on: **a) processes of integration** and alignment of resources [6], understanding internal processes in their congruence and complementarities, that is, integration between processes and organization with the help of logic; **b) learning** – processes that are performed repeatedly, improve the efficiency of the organization and enable identification of dysfunctions **c) adaptation** – running well-organized learning processes, such as benchmarking, in order to gain competitive advantage in dynamic environments and develop the ability to learn from the organization to be a routine practice; thus, organizations with dynamic capabilities are always observing the changes in the environment by evaluation of the markets and competitors and consequently, they are able to adapt to the changes more easily [7]

Business Model Innovation

Business Model

The concept of business model is not unanimous among authors, as [21]Zott, Amit, and Massa (2011) affirms. However, points of convergence are observed between the various definitions found in articles and books. The theorists understand the business model as a concept directly related to creation, delivery and capture of value [4](Osterwalder; Pigneur, 2010). As a way to facilitating the understanding about organizations, [22]Petrovic et al. Kittl. (2001) perceive the business model as a description of a complex business that enables studying the structure, the relationship between the structural elements and how these elements respond in the real world. In this context, [23] Stahler (2002) states that a model is always the simplification of a complex reality and helps to understand the fundamentals of a business or to plan how a business should behave in the future.

In the same context, [24]Magretta (2002) treats the business model as a story that explains how a company works, that is, describes how the "parts" of a business are interconnected. The difficulty to represent all business model elements made [4] Osterwalder (2004) try to unify the concepts in building blocks of the business model, to represent the value creation logics in a tool known as Business Model Canvas. To do so, they used the existing literature as a basis to design the analysis tool that contemplates the set of elements of the business model and their relations to express the logic about how a company makes money. Therefore, the business model canvas is seen as a visual representation of the relationships between the business model elements to facilitate understanding of the value delivered to the customer segments, the organizational architecture of the company and its network of partners. In addition to facilitating the understanding of the business, the visualization of the business model with the help of representation by the tool, brought the possibility to understand the business model in its structural aspect, that is, the structural design of the company [25] (Baden-Fuller & Morgan,

2010) for the exploration of new business opportunities, indicating the possibilities of generating value through a systemic analysis aimed at the innovation of organizations[21] (Zoot; Massa, 2011; [4]Osterwalder; Pigneur, 2010; [3]Cavalcante, S., Kesting, P., & Ulhøi, J 2011).

Business Model Canvas

In the analysis performed in this work, the nine blocks idealized by [4]Osterwalder and Pigneur (2010) have been used as a graphical representation of the business model. The business model (Canvas) is the analysis tool selected for this study, since it is the one that presents the greatest theoretical comprehension among the representations of the analyzed business models [26](Vodovoz, 2015). Thus, the components of the Canvas business model are detailed:

ISSN 2964-5387 (online)
Vol 3, No 2, 2024

1. Customer segment: Individuals or entities that purchase the goods or services.
2. Value proposition: The value proposition is at the heart of the business model. This positioning reflects "what" the company offers to solve the problem or meet the customer's need.
3. Channels: Channels describe how the company delivers products to customers, how the value proposition reaches the customer.
4. Customer relationship: the customer relationship block describes what extent of loyalty the company expects to maintain with their customers.
5. Revenue sources: are the ways revenues enter. This block describes how the money paid by customers reaches the company.
6. Key Features: A pack of key features explains what are the main features that keep the operation of the business model.
7. Key activities: are activities in which the company must be proficient to keep the business model.
8. Key partnerships: are ways to maximize reach or even enable a business model.
9. Cost Structure: The cost structure describes the value that is necessary for the operation of the business model; in an objective way, costs are concentrated on key activities, key resources and partnerships.

Innovating Business Model

The concepts of business models (BMs) and, BM innovation (BMI) have become influential in macro management research in recent years [27] [21] Recent reviews of the BM literature have highlighted the usefulness of the BM construct in research on e-commerce, strategy, and technology management [21] its use in different theories [5] and the evolution of the BM term itself [28] [28] Such reviews also point to definitional convergence so that many contributions to the literature now proffer a notion of BM as the "design or architecture of the value creation, delivery, and capture mechanisms" of a firm [6]

Firm's Performance

Performance has been at the core of management thinking [29] as performance directly affects the continuation of the firm, it became an essential concept in management research [30] [31] have pointed out that firm performance is a multi-dimensional construct. They proposed three general levels of firm performance, i.e. financial performance, business performance and organisational effectiveness, each which their own indicators like for example return on assets (ROA) [32][32], growth, market share, diversification, and product development [33], and employees satisfaction, quality, and social responsibility [30]

The link between business models and firm performance is among the dominant themes in prior business model literature [34] In general, most of the evidence available on the matter is drawn from case study research.

Management Information System

MIS is an integrated system, both human and machine, that provides information to support the operations, management, and decision-making functions in an organization. This concept emphasizes the importance of system integration to provide relevant and timely information to various levels of management and operations in an organization [35]

MIS is a network of procedures that process data within an organization and are combined when necessary to provide data both internally and externally. The goal is to support decision making to achieve organizational goals. Moekijat focuses more on procedures and data processing as part of an information system [36]

III. Research Methods/Materials

Measurement Model

In the first level, reliability and validity of the measurement module is analyzed and assessed in Smart PLS. To valuate separate sub-factors reliability, the identical factor loadings were evaluated with Smart PLS software. As recommended by [37], a value of 0.45 was used as the minimum factor loading for sub-factors, while [38] suggested loading measurements of above 0.50. In this study, the subfactors loading measurements of above 0.45 as suggested by [37]was accepted. The dimension sub-factors that subsidized smallest to the latent constructs were then detached from the dimension model to improve the model fit.

ISSN 2964-5387 (online)
Vol 3, No 2, 2024

F. Results

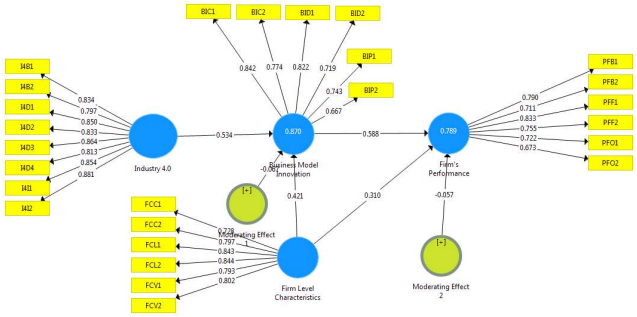

Figure 1. Initial Path Model of the Research

All the factor loading are higher than 0.45 as the minimum factor loading for sub-factors. here is no sub-factor that are lower than 0.45; There is no sub-factor have to be dropout from the model. The resultant final path model Figure. 2 represents.

All the factor loading are higher than 0.45 as the minimum factor loading for sub-factors. There is no sub-factor that are lower than 0.45; There is no sub-factor have to be dropout from the model. The resultant final path model Figure. 2 represents.

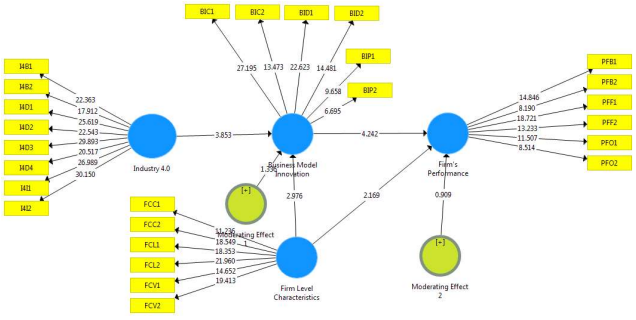

Figure 2. Final Path Model of the Research

Reliability and Validity

Reliability: Inner consistency of measurement model was analyzed by using Cronbach's alpha and composite reliability. Valuation of construct reliability and prediction of inner constancy was focused on composite reliability. As per [39] in PLS-SEM, composite reliability was more appropriate compared to Cronbach's Alfa since it did not undertake that all indicators were similarly consistent. The cut-off score for composite reliability is 0.7 as suggested by [40]and least score should be above 0.6 for Cronbach's Alfa as suggested by [41] The factor loadings, composite reliability and Cronbach's alpha values intended by PLS algorithms were charted in Table1 .As shown in Table 1, the Cronbach's alpha value is above 0.702,and composite reliability score is more than 0.768. Hence, the model can be said as reliable and trustworthy.

Convergence: Convergent validity of dignified constructs was assessed using Average Variance Extracted (AVE) tests, composite reliability scores and Cronbach's alpha[42] which were achieved using Smart PLS software, and the consequences are stated in Table 1. The consequences display that [43], which validates that the dimension sub-factor was suitable for their individual constructs, above the 0.7 thresholds propose all of the considered. Cronbach's alpha standards and composite reliability scores. Also, as per [42] AVE actions the amount of variance that a construct detentions from its displays comparative to the amount due to dimension errors. The consequences of the AVE test Table 1 confirmation that the AVE scores constructs are greater than 0.602.

Discriminant: As per [38] Discriminant validity mentions to the degree to which any single construct is diverse from the additional constructs in the model. In the model, the sub-factors of every construct should be diverse from those of other constructs. The values recorded in Table 2 expressions the diagonal line of standards covering the AVE square root and constructs correlations. Discriminant validity is conventional by confirming that the diagonal line standards are greater related to their columns and rows as endorsed by [42]

Bootstrapping

Structural Model Analysis Smart PLS software was used to observe the structural model as confirmed in the research. Path coefficient assessment is included in the structural model indicating the power of the relations among the R-square value, independent variable, and dependent variable. To define the consequence level of the paths definite within the structural model, a bootstrapping resampling technique [44] of two hundred and fifty-two sample was used. A five percent significance level ($p< 0.05$) is used as a statistical conclusion measure. The level of sig-

ISSN 2964-5387 (online)
Vol 3, No 2, 2024

nificance using the extent of the identical factor estimates between the constructs is indicated in the resultant t-value. Table 3 briefs the result of the structural model.

The influence relationship of business model innovation (BMI) towards firm's performance (FP) was supported and significant with the original sample (□) = 0.588, statistics (t) = 4.242 and significant value (p) = 0.000 indicates that firm's performance (FP) is influenced directly and positively by business model innovation (BMI). While the influence relationship of firm's level

Table 1. Factor Loading for Indicators of Latent Constructs

	Factor and Sub-factors	Factor Loading	Cronbach's alpha	Composite reliability	AVE
1.	Industry 4.0		0.941	0.884	0.708
I4B1		0.834			
I4B2		0.797			
I4D1		0.850			
I4D2		0.833			
I4D3		0.864			

Table 1. Factor Loading for Indicators of Latent Constructs

	Factor and Sub-factors	Factor Loading	Cronbach's alpha	Composite reliability	AVE
I4D4		0.813			
I4I1		0.854			
I4I2		0.881			
2.	Firm Level Characteristics		0.889	0.915	0.643
FCC1		0.728			
FCC2		0.797			
FCL1		0.843			
FCL2		0.844			
FCV1		0.793			
FCV2		0.802			
3.	Business Model Innovation		0.856	0.893	0.583
BIC1		0.842			
BIC2		0.774			
BID1		0.822			
BID2		0.719			
BIP1		0.743			
BIP2		0.667			
4.	Firm Performance		0.843	0.884	0.562
PFB1		0.790			
PFB2		0.711			
PFF1		0.833			
PFF2		0.755			
PFO1		0.722			
PFO2		0.673			

ISSN 2964-5387 (online)
Vol 3, No 2, 2024

Table 2. Discriminant Validity Results

	Business Model Innovation	Firm Level Characteristics	Firm's Performance	Industry 4.0
Business Model Innovation (BMI)	0.764			
Firm Level Characteristics	0.896	0.802		
Firm's Performance	0.876	0.845	0.749	
Industry 4.0	0.909	0.844	0.861	0.841

Table 3. Path Coefficients along with their bootstrap values and 'T' Values

Factors	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics	Sig. Values
BMI ->FP	0.588	0.595	0.139	4.242	0.000
FLC -> BMI	0.421	0.389	0.141	2.976	0.003
FLC -> FP	0.310	0.311	0.143	2.169	0.031
I40 -> BMI	0.534	0.569	0.139	3.853	0.000
ME1 -> BMI	-0.067	-0.067	0.050	1.336	0.182
ME2 -> FP	-0.057	-0.048	0.062	0.909	0.364

Note:

BMI = Business Model Innovation
FP = Firm's Performance
FLC = Firm's Level Characteristics
I40 = Industry 4.0
ME1 = Moderating Effect 1
ME2 = Moderating Effect 2

characteristics (FLC) towards business model innovation (BMI) was supported, and significant with the original sample (β) = 0.421, statistics (t) = 2.976 and significant value (p) = 0.003 indicates that business model innovation (BMI) is directly influenced by firm's level characteristics (FLC).

The influence relationship of firm's level characteristics (FLC) towards firm's performance (FP) was supported, and significant with the original sample (β) = 0.310, statistics (t) = 2.169 and significant value (p) = 0.031 indicates that firm's performance (FP) is directly influenced by firm's level characteristics (FLC). While the influence relationship of industry 4.0 (I40) towards business model innovation (BMI) was supported, and significant with the original sample (β) = 0.534, statistics (t) = 3.853 and significant value (p) = 0.000 indicates that business model innovation (BMI) is directly influenced by industry 4.0 (I40).

The influence relationship of moderating effect 1 (ME1) towards business model innovation (BMI) was not supported, and significant with the original sample (β) = -0.067, statistics (t) = 1.336 and significant value (p) = 0.182 indicates

that business model innovation (BMI) is not directly influenced by moderating effect 1 (ME1). While influence relationship of moderating effect 2 (ME2) towards firm's performance (FP) was not supported, and significant with the original sample (β) = -0.057, statistics (t) = 0.909 and significant value (p) = 0.364 indicates that firm's performance (FP) is not directly influenced by moderating effect 2 (ME2).

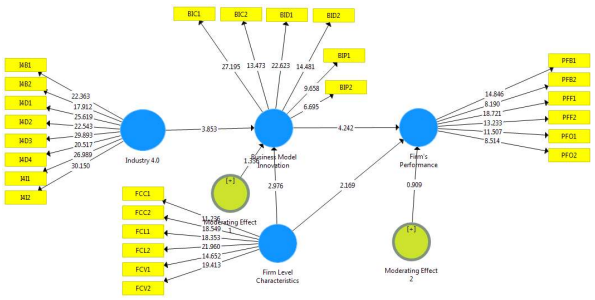

Figure 3. Bootstrapping Final Path Model of the Research

Assessment of fit

For PLS path modeling, Goodness-of-fit (GoF) is recommended as a worldwide fit measure. In this research, evaluation of PLS path modeling accompanies the goodness-of-fit (GoF) measure.

GoF (0 < GoF < 1) is definite as the geometric mean of the average community/ AVE and average R2 (for endogenous construct)

GoF = ×average R2 * average communality = ×0.829 *0.911 = 0.869. The GoF value has been calculated for this research model and was 0.869 (Table 4). The baseline values for validating the PLS model worldwide are GoFlarge = 0.36, GoFsmall = 0.1 and GoFmedium = 0.25 (Akter, D'Ambra and Ray, 2011).

Table 4. Model Evaluation Results

Factors	R^2	Communality
Industry 4.0		0.951
Firm Level Characteristics		0.915
Business Model Innovation (BMI)	0.870	0.893
Firm's Performance	0.789	0.884
Average	0.829	0.911

Table 5. Mean of Industry 4.0 Indicators

	Indicators	Mean
I4D1	Communication via e-mail, WhatsApp,	3.04
I4D2	Firm's website or apps for customer relationship	3.00
I4D3	Searching products or services via internet or apps	3.06
I4D4	Purchasing e-books, e-tickets, e-magazines, e-news	2.89
I4I1	Working using internet, apps, LAN, and WAN	2.93
I4I2	Internet support daily working activities	3.15
I4B1	Using firm's data for daily working activities	2.81
I4B2	Protecting firm's data is important	2.51

Note:
LAN: Local Area Networks
WAN: Wireless Area Networks

G. Discussion

Industry 4.0

Table 5 describe the mean value of each indicator. The lowest mean (2.51) is I4B2, Protecting firm's data is important. Firm has to improve the employees' awareness to protect the firm data. The dynamic global competition need business leaders to think about how to improve their business data to achieve the most efficient and effective business process to serve their customers.

The highest mean (3.15) is internet support daily working activities. Since the leaders realize that internet is important and the critical element to achieve the sustainable competitive advantage.

ISSN 2964-5387 (online)
Vol 3, No 2, 2024

Firm Level Characteristics

Entrepreneurial marketing orientation is the view way of the business leader to seek the proper business opportunities which are proper with their resources. Table 6 describe the mean value of the indicator.

The lowest mean (2.53) is teamwork, safety first, and caring are a part of firm's culture. At the recent time, global competition has been increased. It is caused by many factors. These are digital transformation, industry 4.0, internet of things, changing consumer behavior, changing products or services. Leader has to improve the firm's culture especially about teamwork, safety first, and caring among employees.

The highest mean (2.98) is regular meeting to create innovative responses to a changing business environment. Most of business leaders concern about seeking a solution of problems by conducting regular meeting. It still has to be improved in term of frequency and quality of the regular meeting.

Table 6. Mean of Firm Level Characteristics Indicators

	Indicators	Mean
FCC1	Regular meeting to create innovative responses to a changing business environment.	2.98
FCC2	Firm be able to improve its products or services as a response of changing market circumstances.	2.66
FCV1	Continues learning, and responsible are a part of firm's value	2.62
FCV2	Teamwork, safety first, and caring are a part of firm's culture	2.53
FCL1	Leader delegate the authority	2.93
FCL2	Need for control of employees' working performance	2.74

Business Model Innovation

As the result of managing proper resources, company would achieve the competitive advantage. It is not easy to achieve it. The leaders have a challenge to avoid being another 'me too' business. The way to avoid this is by developing a sustainable competitive advantage that differentiates one company from the competitors.

The lowest mean (3.28) is value co-creation with customers and suppliers. Average companies' leaders tend to agree that company has to produce the superior product quality through value co-creation with customers and suppliers. It means company's leader has to consolidate how to improve the existing product quality to compete the competitors.

Table 7. Mean of Business Model Innovation indicators

	Indicators	Mean
BIC1	Value co-creation with customers and suppliers.	3.28
BIC2	Creating superior customer value by developing a new product which fulfill the needs and/or the wants.	3.53
BID1	Customers segment target is important	3.55
BID2	Customers channels of online and/or offline	3.49
BIP1	Customer relationship for acquiring new customers and maintaining existing customer	3.42
BIP2	Developing revenue stream for market penetration and market development	3.43

The highest mean (3.55) is that customer's segment target is important. To sustain the best market position that is competitive advantage, business leaders have to review regularly its customer's segment target to create proper superior value.

Firm's Performance

Companies operating in emerging economies such as Indonesia, have to manage resources properly to sustain their competitive advantage.

ISSN 2964-5387 (online)
Vol 3, No 2, 2024

All functional strategies, including marketing and sales strategies, operational strategy, human resources, financial resources and so on, have to be created to address the particular challenges of rapid changes and institutional cavities. Company's superior performance consists marketing, sales, and financial performance.

The lowest mean (3.87) is sales revenue increased. This variable have relatively high score of mean. Most of companies' leaders tend to agree that company achieve incremental sales revenue. This achievement has to be maintain to sustain the firm performance. The highest mean (4.25) is firm hires many employees. Most all companies have achieved the best performance of having the incremental number of employees.

Table 8. Mean of Firm Performance Indicators

	Indicators	Mean
PFF1	Sales revenue increased	3.87
PFF2	Payment for employees bonus and salary are full amount and on time.	3.98
PFB1	Firm invests on new machineries and/or building for production	4.15
PFB2	Firm expands its international business	4.06
PFO1	Firm pay for employees education and training	4.07
PFO2	Firm hires many employees	4.25

H. Conclusion

The finding of this research are:

1. Industry 4.0 has a significant influence on business model innovation;
2. Firm level characteristics has no significant influence on the effect of industry 4.0 towards business model innovation;
3. Firm level characteristics has no significant influence on the effect of business model innovation towards firm performance;
4. Business model innovation has a significant influence on towards firm performance.

Recommendation

Future research would be conducted for large sample of companies. By considering the recent situation of global competition, the future research has to take into account the several elements of industry 4.0 such as digital transformation, internet of things, artificial intelligent, big data, A/R, V/R, smart business, and so on.

References

[1] WHO, "Climate change and health," 2021. [1] M. H. Morris, M. Schindehutte, And R. W. Laforge, "Entrepreneurial Marketing: A Construct For Integrating Emerging Entrepreneurship And Marketing Perspectives," Journal Of Marketing Theory And Practice, Vol. 10, No. 4, Pp. 1–19, Oct. 2002, Doi: 10.1080/10696679.2002.11501922.

[2] A. Rojko, "Industry 4.0 Concept: Background And Overview," International Journal Of Interactive Mobile Technologies, Vol. 11, No. 5, Pp. 77–90, 2017, Doi: 10.3991/Ijim.V11i5.7072.

[3] S. Cavalcante, P. Kesting, And J. Ulhøi, "Business Model Dynamics And Innovation: (Re) Establishing The Missing Linkages," Management Decision, Vol. 49, No. 8, Pp. 1327–1342, Sep. 2011, Doi: 10.1108/00251741111163142.

[4] A. , P. Y. , I. C. T. , & S. A. Osterwalder, Business Model Generation: A Handbook For Visionaries, Game Changers And Challengers. 2010.

[5] A. J. Bock, T. Opsahl, G. George, And D. M. Gann, "The Effects Of Culture And Structure On Strategic Flexibility During Business Model Innovation," Journal Of Management Studies, Vol. 49, No. 2, Pp. 279–305, Mar. 2012, Doi: 10.1111/J.1467-6486.2011.01030.X.

[6] D. J. Teece, "Explicating Dynamic Capabilities: The Nature And Microfoundations Of (Sustainable) Enterprise Performance," Strategic Management Journal, Vol. 28, No. 13, Pp. 1319–1350, Dec. 2007, Doi: 10.1002/Smj.640.

[7] D. J. Teece, G. Pisano, And A. Shuen, "Dynamic Capabilities And Strategic Management," 1997.

[8] M. Porter, Competitive Advantage. New York: Free Press, 1985.

[9] J. B. Barney, "Firm Resources And Sustained Competitive Advantage," J Manage, Vol. 17, No. 1, Pp. 99–120, 1991.

[10] C. Et Al. Bowman, "What Are Dynamic Capabilities And Are They A Useful Construct

In Strategic Management? ," International Journal Of Management Reviews, Vol. 1, Pp. 29–49, 2009.

[11] M. Augier And D. J. Teece, "Dynamic Capabilities And The Role Of Managers In Business Strategy And Economic Performance," Organization Science, Vol. 20, No. 2, Pp. 410–421, Mar. 2009, Doi: 10.1287/Orsc.1090.0424.

[12] J. Kraaijenbrink, J. C. Spender, And A. J. Groen, "The Resource-Based View: A Review And Assessment Of Its Critiques," 2010, Sage Publications Inc. Doi: 10.1177/0149206309350775.

[13] R. E. S. Boulton, B. D. Libert, And S. M. Samek, "Cracking The Value Code How Successful Businesses Are Creating Wealth In The New Economy." [Online]. Available: Http://Www.Summaries.Com.Www.Arthurandersen.Com/Value.

[14] A. Et. Al. Lindgreen, "Grant,Value In Business And Industrial Marketing: Past, Present, And Future," Industrial Marketing Management, Vol. 41, No. 1, Pp. 207–214, 2012.

[15] S. Leih, G. Linden, And D. J. Teece, "Business Model Innovation And Organizational Design: A Dynamic Capabiliies Perspective*." [Online]. Available: Https://Ssrn.Com/Abstract=2423191

[16] J. C. Anderson And J. A. Narus, "Business Marketing: Understand What Customers Value Harvard Business Review."

[17] D. J. Teece, G. Pisano, And A. Shuen, "Dynamic Capabilities And Strategic Management," 1997.

[18] R. M. Grant, "Toward A Knowledge-Based Theory Of The Firm," Strategic Management Journal, Vol. 17, Pp. 109–122, 1996.

[19] D. J. Teece, G. Pisano, And A. Shuen, "Dynamic Capabilities And Strategic Management," 1997.

[20] K. M. Eisenhardt And J. A. Martin, "Dynamic Capabilities: What Are They?," 2000.

[21] C. Zott, R. Amit, And L. Massa, "The Business Model: Recent Developments And Future Research," Jul. 2011. Doi: 10.1177/0149206311406265.

[22] S. Et Al. Petrovic, Handbook Of Scheduling : Algorithms, Models, And Performance Analysis. Chapman & Hall/Crc, 2004.

[23] Op. Stahler, Business Models As An Unit Of Analysis For Strategy. Zurich.: Lindenbachstrasse, 2002.

[24] J. Magretta, "Why Business Models Matter," Harv Bus Rev, Pp. 80, 86-92., 2002.

[25] Et Al. Baden-Fuller, "Business Models: A Chalenging Agenda," Strategic Organization Vol. 11 (April): 418-427, Vol. 11, Pp. 418–427, Apr. 2013.

[26] E. Vodovoz And M. R. May, "Innovation In The Business Model From The Perspective Of Dynamic Capabilities: Bematech's Case," Revista De Administracao Mackenzie, Vol. 18, No. 6, Pp. 71–95, 2017, Doi: 10.1590/1678-69712017/Administracao.V18n6p71-95.

[27] P. Spieth, D. Schneckenberg, And J. E. Ricart, "Business Model Innovation - State Of The Art And Future Challenges For The Field," R And D Management, Vol. 44, No. 3, Pp. 237–247, 2014, Doi: 10.1111/Radm.12071.

[28] B. W. Wirtz, V. Göttel, And P. Daiser, "Business Model Innovation: Development, Concept And Future Research Directions," 2016.

[29] M. Haggège, C. Gauthier, And C. C. Rüling, "Business Model Performance: Five Key Drivers," Journal Of Business Strategy, Vol. 38, No. 2, Pp. 6–15, 2017, Doi: 10.1108/Jbs-09-2016-0093.

[30] R. Rauter, J. Jonker, And R. J. Baumgartner, "Going One's Own Way: Drivers In Developing Business Models For Sustainability," J Clean Prod, Vol. 140, Pp. 144–154, Jan. 2017, Doi: 10.1016/J.Jclepro.2015.04.104.

[31] N. Et. Al. Venkatraman, Measurement Of Business Performance In Strategy Research: A Comparison Approaches. Academy Of Management Review, 1986.

[32] A. R. Parker, "Impact On The Organizational Performance Of The Strategy-Technology Policy Interaction," J Bus Res, Vol. 47, Pp. 55–64, 2000.

[33] Gray, Indigenous Rights And Development: Self-Determination In An Amazonian Community. Berghahn Books, 1997.

[34] S. C. Lambert And R. A. Davidson, "Applications Of The Business Model In Studies Of Enterprise Success, Innovation And Classification: An Analysis Of Empirical Research From 1996 To 2010," European Management Journal, Vol. 31, No. 6, Pp. 668–681, Dec. 2013, Doi: 10.1016/J.Emj.2012.07.007.

[35] G. B. Davis, Kerangka Dasar Sistem Informasi Manajemen . 1991.

[36] Moekijat, Manajemen Personalia Dan Sumber Daya Manusia. 1995.

[37] A. L. Comrey, A First Course In Factor Analysis. New York: Academic Press, 1973.

[38] J. Hulland, "Use Of Partial Least Squares (Pls) In Strategic Management Research: A Review Of Four Recent," Strategic Management Journal, Vol. 20, No. 2, P. 195, 1999.

[39] Et Al. Hair, Multivariate Data Analysis, 5th

ISSN 2964-5387 (online)
Vol 3, No 2, 2024

Ed. New Jersey: Prentice Hall, 2011.

[40] D. Gefen, D. W. Straub, M.-C. Boudreau, D. Gefen, D. W. Straub, And M. Boudreau, "Structural Equation Modeling And Regression: Guidelines For Research Practice Structural Equation Modeling Techniques And Regression: Guidelines For Research Practice By," 2000.

[41] Et Al. Hair, Multivariate Data Analysis, 7th Ed. New Jersey: Prentice Hall, 2010.

[42] C. Et Al. Fornell, "Evaluating Structural Equation Models With Unobservable Variables And Measurement Error," Journal Of Marketing Research, Vol. 18, No. 1, Pp. 39–50, 1981.

[43] G. H. Litwin, "Motivation And Organizational Climate," Harvard University Press., 1968.

[44] Bradley. Efron And Robert. Tibshirani, An Introduction To The Bootstrap. Chapman & Hall/ Crc, 1998.