

Conference Paper

Business Innovation, Service Innovation, Industry 4.0 and Making Indonesia 4.0: Perspective on Industrial Engineering

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Abstract

Business innovation is deemed an important factor for sustainable competitive advantages. The mentioned important factors are *vis à vis* not merely product, but also service. Subsequently, this paper elaborates service innovation within ambidexterity approach that comprises two considerations of exploitation and exploration. The exploitation refers to the continuous improvement of the existing activities in companies. Meanwhile, the exploration refers to the breakthrough of new frontier activities in companies that are needed for the company to gain sustainable competitive advantages. Both exploitation and exploration are supported by the theoretical approach and its empirical implementation within companies' sustainable competitive advantages, through grand theory within industrial engineering discipline. This paper elaborates the service innovation that is deemed as antecedents for both financial and nonfinancial performance in the banking industry in Indonesia. The focus of the banking industry in this paper refers to the area of DKI Jakarta, as the center of technology in its capacity as the capital city of Indonesia. The theoretical approach is subsequently implemented through Industry 4.0 that covers trilogy of physical, digital, and biology. Furthermore, the mentioned implementation is aimed at the benefits of Making Indonesia 4.0 with the Indonesia local wisdom and setting. Precisely, it covers focused sectors: food and beverages; textile; automotive; chemical; and electronic. Ultimately, it refers to an action plan as quick wins in term of technology incentive; investor roadshow; vocational education; and innovation center, along with its support for small medium enterprise.

Keywords: Banking industry; contextual ambidexterity; exploration service innovation; exploitation service innovation; financial performance; structural ambidexterity.

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1. Introduction

This paper provides arching theory on service innovation. The mentioned theory is initially derived as it was coined initially by Schumpeter's innovation theory [1, 2] and subsequent theory of capability-rigidity paradox theory [3, 4].

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In this study, the state of the arts on service innovation relates to the service innovation references and its theory [5]. Within the arching theory of service innovation, this paper elaborates furthermore both theoretical and empirical perspectives of business innovation, industry 4.0 and making Indonesia 4.0. That holistic elaboration emphasizes the perspective on Industrial Engineering discipline. This paper elaborates the service innovation that is deemed as antecedents for both financial and nonfinancial performance in the banking industry in Indonesia. The focus of the banking industry in this paper refers to the area of DKI Jakarta, as the center of technology in its capacity as the capital city of Indonesia.

2. Problem statement

Problem statement in this paper refers to the managerial implementation of service innovation within the ambidexterity approaches in both exploitation and exploration. The mentioned managerial implementation are needed within Indonesia local wisdom and setting. Precisely, in the five focused sectors of making Indonesia 4.0: food and beverages; textile; automotive; chemical; and electronic.

3. Research questions

The principal research questions in this paper comprise two questions. The first question refers to the inquiry toward to what extent the arching theory of service innovation relates to other theories as stated in this paper. Subsequently, the second question refers to the inquiry toward to what extent the theoretical aspects in the first question can be implemented by balancing the Industry 4.0. Precisely, this question relates to an inquiry on how to intertwine the industry 4.0 with Making Indonesia 4.0's local wisdom and setting.

4. Purpose of the study

The objective of the study is to provide a review of the theoretical aspect of service innovation and its other theories in this paper. The mentioned review is subsequently capitalized to provide empirical benefits toward the managerial implementation within industrial engineering perspectives.

5. Conceptual models

In line with Schumpeter [2] defines service innovations as technology-based inventions, driven by the emergence of new markets or new service opportunities. Meanwhile, research works of this theory provide a different definition of service innovations as changes in the process of producing lines, improvements in risk assessment, in marketing and in the organization [6].

The research approaches relate to the mixed methods research (MMR), in which involving qualitative approach and quantitative approach, known as quantitative descriptive. Precisely, the approaches in this paper, known as its design, relate to QUAN Qual emphasized, within the category of explanatory sequential mixed methods design and its subcategory of follow-up explanation model [7].

The banking industry in this paper is chosen with the consideration that banking industry is important to the country's economy and is highly regulated, unlike other industries. Banks, directly or indirectly provide all the money that individual or corporate owns. Eventually, banks within the banking industry are indispensable for country's economy along with its technology landscape [8].

The importance of this paper is originated from the fact fifty years ago, the life expectancy of an organization according to Standard and Poor's 500 was 50 yr. Today, the expectancy year is closer to 12 yr. Amount 50 yr ago, leaders of an established organization had the luxury of time. If they were slow to react to change, they could recover. In today's world, organizations that fail to respond to disruptive innovation, including service innovation quickly find themselves out of business [9].

Research model in Figure 1, indicate the Smart PLS 3.0 for Banking Industry Implementation. Bank as an organization, is facing a challenging problem in balancing service innovation exploitation and service innovation exploration to achieve both financial and non-financial performance [4, 10, 11]. In the organization, this balance between exploitation and exploration is identified as ambidexterity that creates tensions in different fields. These tensions have given pressures on an organization to gain a competitive advantage in increasingly turbulent and competitive markets [10, 12].

This research background comprises discussion on the context and content of this dissertation. The context of this dissertation refers to the practical implication in the banking industry within the financial system in the digital revolution. The discussion on mentioned context emphasizes issues, the aspect of urgency, importance, and practical implication. Meanwhile, the content of this dissertation refers to the variable of

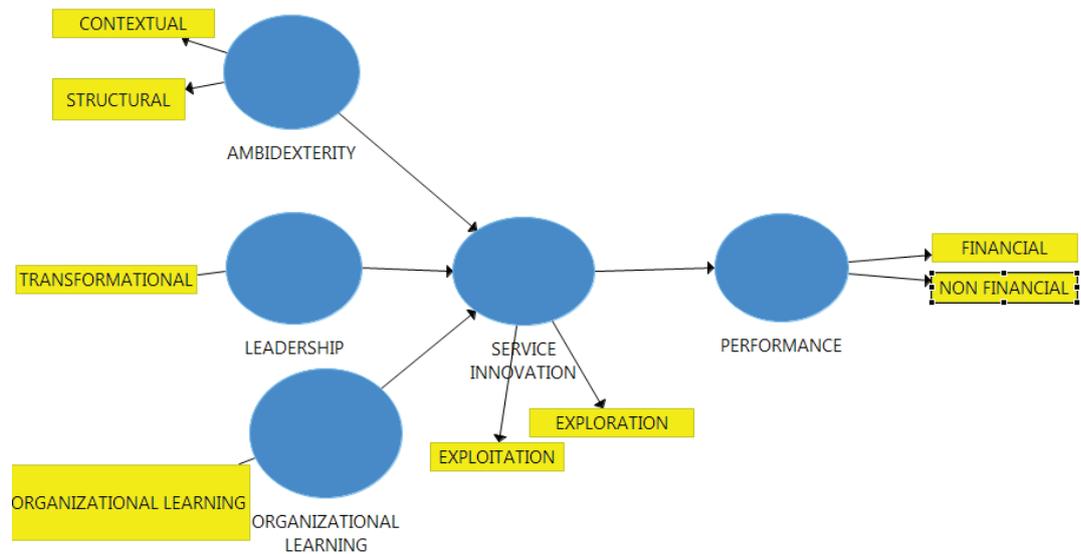


Figure 1: Research model overview of this paper implication using SmartPLS 3.0

ambidexterity, transformational leadership and organizational learning toward service innovation to achieve performance.

The banking industry and its service innovation in this paper focus merely on retail banking. In overview, banking services are categorized into three big areas, which are retail banking; business and corporate banking; and investment banking [8].

The banking industry in this paper is chosen with the consideration that banking industry is important to the country's economy and is highly regulated, unlike other industries. Banks, in this paper is directly or indirectly providing all the money that individual or corporate owns. Eventually, banks within the banking industry are indispensable for country's economy along with its technology landscape [8].

Ultimately, in this study, the applied theories are referred to antecedents of service innovation, which are ambidexterity, transformational leadership, and organizational learning. First, ambidexterity refers to paradox theory [10]. This variable 's theory is further elaborated in the intellectual structure of ambidexterity [13].

The tension from balancing exploitation and exploration is one of the novelties in this study and a unified framework among service innovation antecedents (ambidexterity, transformational leadership, and organizational learning). Unlike other antecedents of service innovation; this ambidexterity, transformational leadership, and organizational learning have ambidexterity tensions to balance exploitation (incremental innovation) and exploration (radical innovation) [10]. This study excludes service innovation in manufacturing and focuses on the service sector.

Second, leadership refers to an applied theory of transformational leadership theory [14] that is categorized under neo-charismatic theories [15]. Third, organizational learning refers to organizational learning theory [16] This variable's theory is further elaborated in the intellectual structure of organizational learning [6].

The overall variables in prior discussion are summarized in Table 1 and Table 2 for further overview.

TABLE 1: Validity Conclusion based on AVE and CR Value.

Code	Dimension/Variable	AVE	CR	Conclusion
A1	Structural Ambidexterity	0.610	0.823	Valid
A2	Contextual Ambidexterity	0.700	0.875	Valid
A	Ambidexterity	0.513	0.862	Reliable
TL	Transformational Leadership	0.698	0.874	Reliable
OL	Organizational Learning	0.696	0.871	Reliable
SI1	Service Innovation Exploitation	0.702	0.904	Valid
SI2	Service Innovation Exploration	0.657	0.884	Valid
SI	Service Innovation	0.642	0.935	Reliable
NFP	Non-Financial Performance	0.687	0.897	Valid
FP	Financial Performance	0.576	0.871	Valid
P	Performance	0.561	0.919	Reliable

TABLE 2: Hypothesis test and conclusion of hypothesis.

Hypothesis Test	T Statistics (IO/STDEVI)	Path Coefficient	T Statistics Criteria	Path Coefficient Criteria	Significance of Construct	Conclusion of Hypothesis
H1: A -> SI	3.454	0.205	t value > 0	Positive	Significant	ACCEPTED
H2: TL -> SI	1.745	0.113	t value > 0	Positive	Significant	ACCEPTED
H3: OL -> SI	14.008	0.679	t value > 0	Positive	Significant	ACCEPTED
H4: SI -> P	19.789	0.723	t value > 0	Positive	Significant	ACCEPTED

6. Conclusion

The conclusion of this paper is based on the following statements:

1. Ambidexterity has a positive and significant effect on service innovation. The higher the ambidexterity implies better service innovation. By doing so, the implementation of higher ambidexterity in an organization can generate better service

innovation. This situation is caused by the contextual ambidexterity that combines exploitation and exploration of service innovation.

2. Transformational leadership has positive and significant effect significant on service innovation. The more intense transformational leadership implies better service innovation. By doing so, the leader that intensely transforms can generate better organization's service innovation. This situation is caused by the transformational leader that provides clear aims and commitment; motivation and guidance; and look out for new opportunities.
3. Organizational learning has a positive and significant effect on service innovation. The more frequent organizational learning happens in an organization implies better service innovation. By doing so, the frequent effort on organizational learning can generate better service innovation. This situation is caused by organizational learning that provides news and relevant knowledge; critical capacities and skills for better service innovation.
4. Service innovation has a positive and significant effect on performance. The better service innovation implies better performance. By implementing the proper service innovation can generate better performance of an organization. This situation is caused by service innovation that provides both financial and nonfinancial performance.

Based upon the conclusion of this dissertation, the recommendations for the regulator in the banking industry are following statements:

1. The awareness of the similarities and differences of banks under regulation, within policy and implemented regulation. It is recommended that regulator in the banking industry is aware of those banks under regulation, that influences the policy and regulation from the regulator on banks' service innovation and its performance. The banking industry is important to the country's economy and is highly regulated, unlike other industries, along with its technology landscape. This awareness is subsequently indispensable for the regulator in the banking industry to issue the policy and regulation for banks within the banking industry.
2. The awareness of the technological disruption in the digital revolution

It is recommended that the regulator in the banking industry is aware of technological disruption in the digital revolution. Nowadays, the digital revolution turned the situation while banking activities once were deemed as a useful activity that provided important

economic function. The issues emerged as banking become out of control because the digital revolution rendered banking regulation ineffective. Digital revolution provides new possibilities that make banking activity redundant.

The theoretical approach is subsequently implemented through Industry 4.0 that covers trilogy of physical, digital, and biology.

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