Boosting the Firm Transformation in Industry 5.0: Experience-Agility Innovation Model
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Abstract
Industry 5.0 brings collaborative and automatic environment, thus creating a new paradigm for companies in doing business. The way organizations manage resources and capability, especially in relationship with people, culture and process in creating new business models have changed. Previous studies on developing innovation based on customer experience and agility of organization focus on the concept, relationship among variables and the implication. However, in the context of industry 5.0, the study on those topics has not been revealing. Hence, this study aims to assess the concept of experience-agility innovation model to support transformation in the context of digital transformation to face Industry 5.0. The proposed model was assessed with 195 Indonesia ICT firms using SEM-PLS statistical tools. The findings demonstrate that the firm that offers compelling value proposition from customer experience while concurrently developing agility in the organization to create business model innovation could boost the transformational performance. For further researches, the study can be enhanced through expanding the model, sample, and time.

Keywords: customer experience, organizational agility, business model innovation, transformational performance, industry 5.0

1. Introduction

Industry 4.0 chiefly discusses digitalization focus on adoption of digital technologies such as internet of things, big data, artificial intelligence, blockchain, and cloud computing. Those technologies bring out the capability for adaptive and agile organization to focus on customer experience. While companies are struggling in handling the emerging technologies and agility in Industry 4.0, they need to start to think about the transition into Industry 5.0. Even though both industry 4.0 and 5.0 have kept technology as the centre of their respective businesses, to sustain their business the firms will need to provide agility in organization to involve technology in fulfilling customer aspirations. Industry 5.0 focus on human-centered technology (Fujii, Guo, & Kamoshida, 2018; Onday, 2019). Industry 5.0 provides smart community and collaboration between people, and smart technology to take over the manual and repetitive tasks integrating with human creativity to elevate the quality of product and service in creating customer experience. The combination of quality service, customer experience and organizational agility provides a balance between economic advancement with social resolution (Paschek, Mocan, & Draghici, 2019)

The changing of the societal paradigm brings the challenge of the company to survive and sustain their business to face Society 5.0. The previous studies have shown that the linking
customer experience with mapping of business model has enabled companies to create innovation to survive in a disruptive era (Loss & Crave, 2011; Leonardus W Wasono Mihardjo, Sasmoko, Alamsjah, & Elidjen, 2019). Thus, customer experience becomes a source of competitive advantage when the linkage between customer experience and business model could be synergized (Seppanen & Laukkanen, 2015). Business models have been intensively discussed and well suited to depicting current business and become the practical tools to visualize value proposition (Chesbrough & Rosenbloom, 2002; Osterwalder & Pigneur, 2010; Teece & Linden, 2017; Zott & Amit, 2017). Business models are also linked to the concepts of value creation for collaboration as part of value co-creation (Basceanu, 2014; Nenonen & Storbacka, 2010). Putting more customers in collaboration could create more customer experience as the central element of a promise of values created for the customers by a firm’s offering (Ramaswamy, 2008; Sjödin & Kristensson, 2012). To support the development of business model and customer experience in a differentiated value proposition of the firm, the firm is required to transform their static capability into most important dimension of organization in term of agility organization as the source of sustainable value creation (Carvalho, Sampaio, Rebentisch, Carvalho, & Saraiva, 2017). The agility of an organization is determined by human factor related with people, culture and process (Carvalho et al., 2017; Crocitto & Youssef, 2003). Since Industry 5.0 also puts the attention on human centre supported by technology in developing a smart community, the agility of the organization takes a crucial part for the firms.

However, there is scant evidence on how a firm could construct business model innovation and put human centre as a cultural mindset that enables the firm to generate new business opportunities, especially in anticipating the new Society 5.0. The human centre puts into the way of the firms to look at the opportunity based on the feedback from customer experience and the way of organization to adapt to change and perform business model become a crucial part to facing industry 5.0. Hence, in this paper, in anticipating Industry 5.0, the study put a central element of customer experience and agility organizational that focus on human centre to develop business model innovation to improve transformational performance.

The structure of the paper is as follows: First, we discuss recent perspectives on experience-agility and business model innovation as well as the hypothesis development. Then we discuss the research model, methodology, research findings, discussion and the implication model with an experience-agility innovation model for implication to theory and practice before conclusions and suggestions for further research.
2. Literature Review and Hypothesis Development

2.1. Industry 5.0 and Transformational Performance

Industry 5.0 brings the new paradigm of the way the firm to manage the company. The use of Internet of things (IoT) enables the collaboration shift from individual collaboration to society collaboration, enabling advanced services through interconnecting and evolving interoperable information and communication technologies (Zhang et al., 2015). This interconnection and interoperability have impacted on releasing any constrain due to the nature of internet and digital technology to boost development of smart society (Onday, 2019). The Industry 5.0 also brings the positive impact by resolving social issues and creating abundance for society since the knowledge society are being identified and integrated into online society supported by technology (Wang, Yuan, Wang, & Qin, 2018). The concept of measurement to ensure the transformation program on the track shall consider the long-term objective to support sustainable development as shown in Figure 1.

Figure 1. Sustainable development in society 5.0 (Mayumi Fukuyama, 2018)

The performance measurement in transformational performance shall consider not only existing performance but also sustainable development element in society 5.0 which are the potential performance coming from the technology and the ecosystem related with society development. Hence, to address the transformation of the firm, this study uses the dimension of transformational performance.
2.2. Customer Experience

Industry 5.0 focuses on human centre, while customer experience mostly related with human experience that related with sensory behavior, cognitive and social of customers as humans (Bolton, 2016; Ramaswamy, 2011). Customer experience involves every chain of customer’s journey as part of a company’s offering (Lemon & Verhoef, 2016). Hence, the scope of customer experience covers the journey of customer, starting from relation, engagement in service or product, usage and after product and service engagements including loyalty and brand performance (Palmer, 2010; Priyanka Shrivastava, 2016). In digital era, customer experience becomes a critical part of the success of the company, since the digital technology could provide new interactions with customers and enable customers to have direct influence on the company (Leonardus W Wasono Mihardjo et al., 2019; Parise, Guinan, & Kafka, 2016).

In industry 5.0, the experience of customers has shifted from personalization of customization into mass customization based on society development (Bansal, 2018) through development technological platforms to expand in scale maximum product customization with flexibility to the customer. The use of technology is critical to obtain the right information and major important as the feedback to the firm in decision making (Meyer & Schwager, 2007). Hence, the use of big data to support development of the journey of customer in society 5.0 has significant influence to drive economic and social value (Chandola, 2015; Özdemir & Hekim, 2018). With technology capability, the point out of experiences could provide distinct firm capability.

Overall customer experience could lead to customer satisfaction (Brochado, Troilo, & Shah, 2017; Fatma, 2014) and sustainability (Chandola, 2015) which an antecedent of brand performance, customer relation, price and promotion as well as service offering in personalization. Furthermore, in society community, the experience of customer can be the opportunity to create a new promoter (Situmorang, Rini, & Muda, 2017). Although some potential pitfalls can happen as a tradeoff, that a superior experience may be quite expensive (Lemon & Verhoef, 2016).

2.3. Organizational Agility

Since industry 5.0 focuses on collaboration among machines and humans, with humans as the centre of creativity. Therefore, the organizational agility in industry 5.0 was focused on humans as the centre for agility. The organizational agility could be defined as the adaptability
of the firm to adjust strategic direction to align with the core business to create value (Doz & Kosonen, 2010). Agility can also be defined as part of making flexibility in terms of simplification and fast-moving decision (Hugos, 2009). Agility is the ability to adapt with the market change with high quality service, low cost with shorter time in varying product volume to create customer value (Vokurka & Fliedner, 1998). In this study we refer the organizational agility is the firm’s capability to adapt to changes by providing effective and efficient capacity to create value.

In addition, to face society 5.0, the organizational agility merely focuses on resource deployment to be more effective and efficient. The best approach may be to build the organization based on the human factors: people, culture and process (Carvalho et al., 2017; Crocitto & Youssef, 2003). People is centre of the firm’s capability to take opportunity and risk to create company value. The culture and process could bring the company more profitable by optimizing operations and achieve efficiency as part of culture and the lean process of the organization (Banu Ozkeser, 2018). Understanding the organizational agility based on human as centre requires an overall framework of sustainable foundation of the firm to make higher-quality decisions and to help scholars to have a better understanding in facing Society 5.0.

2.4. Business model innovation

Society 5.0 enables the collaboration between machine and humans through technology; it means a new business model where building a cooperative relation between machine and human has become a critical part. Business model is defined as a rationale organization to perform value delivery by providing systematic tool through business model canvas (Osterwalder & Pigneur, 2010). Business model innovation as a process enables other network to contribute and innovate in delivering value (Berglund & Sandström, 2013; Chesbrough, 2012). The last study demonstrates that the majority of business executives believe that new business models innovation has a greater source of competitive advantage than new products and services (Bashir & Verma, 2017). The term of business model innovation was extended to the effort to create value for sustainability (Inigo, Albareda, & Ritala, 2017). However, the grand challenge remains: current business model innovation fails to sufficiently consider the sustainability dimension (Boons & Lüdeke-Freund, 2013). The result of business model innovation could make a firm lost opportunity for embedding sustainability in terms of content, structure and governance dimensions that the firm capability could not perform well (Zott & Amit, 2010) to anticipate the development of society 5.0 in the
future. hence the sustainability dimension for business model innovation based on content, structure and governance innovation being explored in this study.

2.5. Hypothesis Development

The previous study has found that customer experience has relation in developing of business model innovation where customer experience as a centre of building business model innovation (Seppanen & Laukkanen, 2015). The relationship between business model innovation and customer experience was also involving the collaboration between customer and firms (Loss & Crave, 2011) and customer experience has played a significant role in developing firm performance (Fatma, 2014; Stuart & Tax, 2004). Hence, we develop the hypothesis as follow:

**Hypothesis 1:** Customer Experience has significant effects on Business Model Innovation

**Hypothesis 2:** Customer Experience has significant effects on Transformational performance

The relationship between organization and business model innovation has been discussed to perform agile business model innovation (Loss & Crave, 2011). And model agility driven business model could perform the performance (Arbussa, Bikfalvi, & Marquès, 2017). Hence, the hypothesis can be formulated as follows:

**Hypothesis 3:** Organizational Agility has significant effects on Business Model innovation

**Hypothesis 4:** Organizational Agility has significant effects on Transformational Performance

Many studies have found that business model innovation has significant influence to drive firm’s performance (Amit & Zott, 2010; Cucculelli & Bettinelli, 2015; Leonardus Wahyu Wasono Mihardjo, Alamsjah, Elidjen, & Sasmoko, 2018) The hypothesis then can be concluded as follows:

**Hypothesis 5:** BMI has significant effects to Transformational Performance
According to those previous study, the development of research model can be performed in Figure 2.

![The Research Model](image)

**Figure 2. The Research Model**

### 3. Research Methodology

The survey-based study used questionnaires to collect primary data to assess the model of experience-agility innovation model by focusing on the ICT companies of Indonesia. Data were collected from senior leaders as the representative of these company. In general, the determination of study sample size is a balance between resource capability and adequate statistical requirement. According to, simple rule of thumb suggested that a sample that is larger than 30 and less than 500 (Cohen, 1992). According to Pallant (2013) the most suitable sample has to 5 times of indicators. Hence, this study provides the sample with numbers of 195 samples out of population of 542 (ministry of communication and information, 2017) which is higher than minimum of 190 samples as result 5 times 38 of indicators.

Thus, 225 questionnaires were distributed among the employees of ICT companies in Indonesia. All the questionnaires were distributed by using random sampling techniques. In total, 201 answers were received, and 195 valid responses were used to analyze the data. Partial Least Square (PLS) is used for statistical tool in data analysis.

### 4. Results

Figure 3 shows the first step of PLS-SEM in which measurement model. In the next step, it is found that the factor loading is above 0.5 which confirms the internal consistency. Composite reliability (CR) and average variance extracted (AVE) is also higher than 0.7 and 0.5 respectively. All the results are demonstrated in Table 1.
Table 1. Construct’s Reliability and Validity

<table>
<thead>
<tr>
<th>Construct</th>
<th>Cronbach’s Alpha</th>
<th>rho_A</th>
<th>Composite Reliability</th>
<th>AVE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business Model Innovation</td>
<td>0.897</td>
<td>0.911</td>
<td>0.923</td>
<td>0.67</td>
</tr>
<tr>
<td>Customer Experience Orientation</td>
<td>0.923</td>
<td>0.934</td>
<td>0.936</td>
<td>0.57</td>
</tr>
<tr>
<td>Organizational agility</td>
<td>0.938</td>
<td>0.942</td>
<td>0.947</td>
<td>0.62</td>
</tr>
<tr>
<td>Transformational Performance</td>
<td>0.896</td>
<td>0.899</td>
<td>0.919</td>
<td>0.61</td>
</tr>
</tbody>
</table>

Discriminant validity is given in Table 2. This study used cross loadings method for this purpose.

Table 2. Cross Loadings

<table>
<thead>
<tr>
<th></th>
<th>Brand Perf</th>
<th>Content Innov</th>
<th>Cust Rel.</th>
<th>Ecosys tem</th>
<th>Existing</th>
<th>Gov Innov</th>
<th>Potential</th>
<th>Price</th>
<th>Structure e Innov</th>
<th>Trust Personal</th>
<th>Culture Agility</th>
<th>People agility</th>
<th>Process agility</th>
</tr>
</thead>
<tbody>
<tr>
<td>BP1</td>
<td>0.365</td>
<td>0.171</td>
<td>0.300</td>
<td>0.049</td>
<td>0.427</td>
<td>0.443</td>
<td>0.316</td>
<td>0.543</td>
<td>0.165</td>
<td>0.215</td>
<td>0.349</td>
<td>0.054</td>
<td>0.305</td>
</tr>
<tr>
<td>BP2</td>
<td>0.916</td>
<td>0.293</td>
<td>0.601</td>
<td>0.248</td>
<td>0.609</td>
<td>0.647</td>
<td>0.505</td>
<td>0.383</td>
<td>0.442</td>
<td>0.369</td>
<td>0.609</td>
<td>0.032</td>
<td>0.588</td>
</tr>
<tr>
<td>BP3</td>
<td>0.911</td>
<td>0.315</td>
<td>0.489</td>
<td>0.165</td>
<td>0.561</td>
<td>0.535</td>
<td>0.441</td>
<td>0.411</td>
<td>0.396</td>
<td>0.380</td>
<td>0.524</td>
<td>0.189</td>
<td>0.433</td>
</tr>
<tr>
<td>CA1</td>
<td>0.357</td>
<td>0.442</td>
<td>0.507</td>
<td>0.484</td>
<td>0.492</td>
<td>0.427</td>
<td>0.629</td>
<td>0.297</td>
<td>0.530</td>
<td>0.365</td>
<td>0.878</td>
<td>0.620</td>
<td>0.758</td>
</tr>
<tr>
<td>CA2</td>
<td>0.491</td>
<td>0.229</td>
<td>0.394</td>
<td>0.278</td>
<td>0.423</td>
<td>0.337</td>
<td>0.491</td>
<td>0.182</td>
<td>0.396</td>
<td>0.255</td>
<td>0.886</td>
<td>0.380</td>
<td>0.707</td>
</tr>
</tbody>
</table>
Structural model is highlighted in Figure 3 which is examined to test the relationship between variables. In this process, hypotheses were examined to check whether the hypotheses are supported or not. T-value was considered to test the hypotheses. The hypotheses having t-value above 1.96 were accepted and hypotheses having t-value below 1.96 were not supported. These results are available in Table 4. It is found that customer experience orientation has no significant impact on driving business model innovation, which supported H1. The relationship between customer experience orientation was positive impact to boost transformational performance, which supported H2. In the same direction, the effect of organizational agility has significant impact on business model innovation and transformational performance, which
supported $H_3$ and $H_4$, respectively. Business model innovation has positive effect on transformational performance which supported $H_5$.

![Figure 3. Structural Model Result](image)

The result of hypothesis testing as follows:

**Table 4. Testing of Hypothesis partially**

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Standard Deviation</th>
<th>T Statistic</th>
<th>P Values</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Customer Experience Orientation -&gt; Business</td>
<td>0.146</td>
<td>4.300</td>
<td>0.000</td>
<td>Significant</td>
</tr>
<tr>
<td>Model Innovation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 Customer Experience Orientation -&gt; Transformational Performance</td>
<td>0.202</td>
<td>0.861</td>
<td>0.389</td>
<td>No Significant</td>
</tr>
<tr>
<td>3 Organizational agility -&gt; Business Model Innovation</td>
<td>0.134</td>
<td>2.534</td>
<td>0.011</td>
<td>Significant</td>
</tr>
<tr>
<td>4 Organizational agility -&gt; Transformational Performance</td>
<td>0.164</td>
<td>2.226</td>
<td>0.026</td>
<td>Significant</td>
</tr>
<tr>
<td>5 Business Model Innovation -&gt; Transformational Performance</td>
<td>0.227</td>
<td>3.045</td>
<td>0.002</td>
<td>Significant</td>
</tr>
</tbody>
</table>

* significant at ($\alpha = 0.05$ (T statistics $> 1.96$))

The Indirect hypothesis test to measure the simultaneous hypothesis test to assess the intervening role of dependent variables. Table 5 demonstrates business model innovation plays...
a significant role on the relationship between customer experience orientation and transformational performance as well as the relationship between organizational agility and transformational performance.

**Table 5. Testing of Hypothesis simultaneous**

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Standard Deviation</th>
<th>T Statistic</th>
<th>P Values</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Customer Experience Orientation -&gt; Business Model Innovation -&gt; Transformational Performance</td>
<td>0.168</td>
<td>2.581</td>
<td>0.010</td>
<td>Significant</td>
</tr>
<tr>
<td>Organizational agility -&gt; Business Model Innovation -&gt; Transformational Performance</td>
<td>0.121</td>
<td>1.974</td>
<td>0.049</td>
<td>Significant</td>
</tr>
</tbody>
</table>

* significant at (=0.05 (T statistics > 1.96)

5. Discussion

The finding demonstrates that business model innovation plays significant role to boost transformational performance to anticipate Society 5.0. This quantitative research reveals that the human centre supported by technology will drive the transformational performance. It is shown from the finding that organizational agility based on human capability has higher significant influence compared to customer experience orientation. This finding also reveals issues related the firm transformation to face society 5.0: challenges in improving people competence, culture of innovation and the process related to the use of technology (Paschek et al., 2019). Customer experience in industry 5.0’s focus on mass customize based platform collaboration is also revealed in this study. The customer relation plays significant influence in developing customer experience, because with multichannel relations customer could access any firm service to perform collaborative innovation. Figure 4 shown the transformation model for the firm in facing industry 5.0 based on experience-agility innovation model. The transformational performance that focuses on existing performance, potential performance and ecosystem performance could be managed when the company could control the revenue, maintenance, development and cost as the continuous innovation. The enabler to achieve the implementation system is supported by business model innovation that consists of content, structure and governance innovation to support revenue as well as customer experience in managing maintenance, development and costs. Customer relation is a critical part in creating customer experience. The foundation of the transformation firm in society 5.0 is people, process and culture supported by technology to achieve effective and efficient value creation.
The model of experience-agility innovation provides implications of the manager of the firm in providing fast decision making in all company process to support the effective and efficient value creation.

The model also contributed to the theory of sustainability for transforming the firm in anticipating the changing of society as impact of massive technology developments.

6. Conclusions
This paper demonstrates the new model of transformation, that focus on exploiting the customer experience and organizational agility concept. Customer experience and organizational agility can be the source of competitive advantage in industry 5.0 The proposed model of experience-agility innovation can be used in many perspectives, which is helpful in the business model innovation process, enhancing revenue, and increasing profit and loss. Although the model can reveal some indicators of society 5.0, the fact the sample and the time
of survey are limited, thus further studies are needed. Further research is needed to develop customer experience and customer experience scales that can be utilized effectively in business model design by expanding the sample across industry and country and expanding the time of study to come up with longitudinal study. Finally, it could be an interesting research topic, when the study could reveal possible contradictions between the different customer experience requirements of a company’s different business model.

References


