

Boosting the Firm Transformation in Industry 5.0: Experience-Agility Innovation Model

Leonardus W Wasono Mihardjo, Sasmoko, Firdaus Alamsyah, Elidjen

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.

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

I. 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, Alamsyah, & 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.

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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.

D. 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.

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.

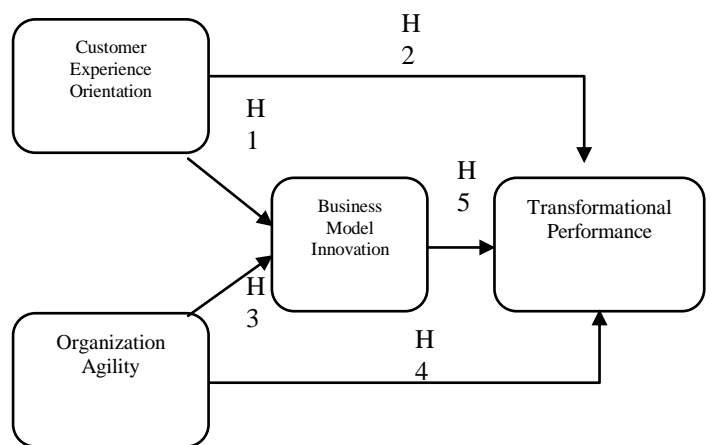


Figure 2. The Research Model

III. METHOD

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.

IV. RESULT

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.

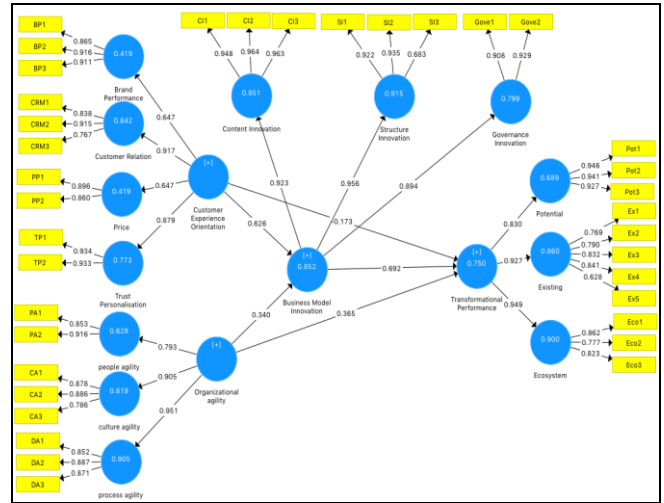


Figure 3. Measurement Result

Table 1. Construct's Reliability and Validity

	Cronbach's Alpha	rho_A	Composite Reliability	AVE
Business Model Innovation	0.897	0.911	0.923	0.670
Customer Experience Orientation	0.923	0.934	0.936	0.576
Organizational agility	0.938	0.942	0.947	0.621
Transformational Performance	0.896	0.899	0.919	0.619

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

Table 2. Cross Loading

	Brand Perf	Content Innov	Cust Rel.	Ecosystem	Existing	Gov Innov	Potential	Price	Structure Innov	Trust Personal	Culture Agility	People agility	Process agility
BP1	0.865	0.171	0.3	0.049	0.427	0.443	0.316	0.545	0.165	0.215	0.349	0.054	0.305
BP2	0.916	0.293	0.601	0.248	0.609	0.647	0.505	0.383	0.442	0.369	0.609	0.312	0.588
BP3	0.911	0.315	0.489	0.165	0.561	0.535	0.441	0.411	0.396	0.38	0.524	0.189	0.433
CA1	0.357	0.442	0.507	0.484	0.492	0.427	0.629	0.297	0.53	0.365	0.878	0.62	0.758
CA2	0.491	0.229	0.394	0.278	0.423	0.337	0.491	0.182	0.396	0.255	0.886	0.38	0.707
CA3	0.592	0.575	0.576	0.535	0.688	0.74	0.789	0.478	0.675	0.463	0.786	0.517	0.799
CI1	0.118	0.948	0.62	0.569	0.512	0.604	0.529	0.559	0.75	0.753	0.425	0.519	0.497
CI2	0.331	0.964	0.688	0.668	0.675	0.776	0.591	0.606	0.855	0.824	0.471	0.476	0.541
CI3	0.396	0.963	0.732	0.666	0.707	0.784	0.694	0.628	0.857	0.813	0.546	0.572	0.62
CRM1	0.418	0.603	0.838	0.392	0.484	0.519	0.667	0.356	0.648	0.526	0.569	0.616	0.648
CRM2	0.273	0.681	0.915	0.444	0.422	0.444	0.582	0.351	0.735	0.735	0.47	0.609	0.577
CRM3	0.667	0.508	0.767	0.448	0.677	0.609	0.455	0.52	0.562	0.672	0.451	0.428	0.438
DA1	0.316	0.372	0.485	0.517	0.487	0.469	0.712	0.021	0.558	0.242	0.717	0.592	0.852
DA2	0.404	0.685	0.63	0.524	0.545	0.681	0.737	0.397	0.739	0.521	0.771	0.632	0.887
DA3	0.604	0.438	0.592	0.477	0.658	0.592	0.797	0.407	0.634	0.431	0.844	0.56	0.871
Eco1	0.126	0.403	0.245	0.862	0.706	0.517	0.619	0.316	0.467	0.283	0.424	0.482	0.491
Eco2	0.27	0.743	0.677	0.777	0.713	0.646	0.685	0.319	0.781	0.753	0.584	0.618	0.637
Eco3	0.061	0.5	0.346	0.823	0.624	0.466	0.37	0.34	0.503	0.382	0.267	0.426	0.292
Ex1	0.528	0.662	0.561	0.611	0.769	0.789	0.598	0.534	0.689	0.572	0.514	0.438	0.493
Ex2	0.295	0.543	0.417	0.778	0.79	0.623	0.587	0.453	0.511	0.488	0.454	0.378	0.461



Ex3	0.34	0.555	0.479	0.767	0.832	0.629	0.688	0.343	0.638	0.418	0.52	0.503	0.645
Ex4	0.734	0.443	0.634	0.56	0.841	0.745	0.693	0.382	0.595	0.424	0.542	0.517	0.551
Ex5	0.617	0.299	0.335	0.394	0.628	0.506	0.308	0.4	0.347	0.395	0.49	0.191	0.3
Gove1	0.71	0.581	0.52	0.522	0.78	0.908	0.729	0.595	0.653	0.48	0.584	0.356	0.606
Gove2	0.44	0.796	0.618	0.684	0.781	0.929	0.676	0.459	0.733	0.623	0.533	0.611	0.628
PA1	0.252	0.44	0.478	0.582	0.511	0.45	0.394	0.27	0.434	0.362	0.468	0.853	0.465
PA2	0.16	0.518	0.661	0.528	0.458	0.495	0.726	0.143	0.638	0.356	0.59	0.916	0.717
PP1	0.352	0.62	0.46	0.449	0.527	0.505	0.352	0.896	0.445	0.634	0.403	0.315	0.317
PP2	0.505	0.469	0.393	0.23	0.409	0.494	0.264	0.86	0.302	0.508	0.27	0.059	0.252
Pot1	0.37	0.639	0.636	0.625	0.658	0.682	0.946	0.372	0.76	0.446	0.729	0.689	0.826
Pot2	0.482	0.545	0.644	0.651	0.721	0.688	0.941	0.286	0.723	0.452	0.725	0.55	0.808
Pot3	0.502	0.598	0.614	0.652	0.771	0.776	0.927	0.337	0.806	0.474	0.69	0.603	0.788
SI1	0.39	0.779	0.729	0.703	0.75	0.776	0.849	0.374	0.922	0.629	0.598	0.703	0.759
SI2	0.345	0.834	0.735	0.584	0.634	0.695	0.718	0.358	0.935	0.721	0.521	0.509	0.626
SI3	0.264	0.56	0.484	0.524	0.457	0.418	0.472	0.394	0.683	0.442	0.54	0.325	0.5
SI4	0.264	0.56	0.484	0.524	0.457	0.418	0.472	0.394	0.683	0.442	0.54	0.325	0.5
TP1	0.381	0.763	0.721	0.483	0.565	0.588	0.472	0.645	0.62	0.934	0.378	0.384	0.432
TP2	0.311	0.792	0.719	0.585	0.538	0.542	0.439	0.577	0.708	0.933	0.433	0.369	0.434

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 H₃ and H₄, respectively. Business model innovation has positive effect on transformational performance which supported H₅

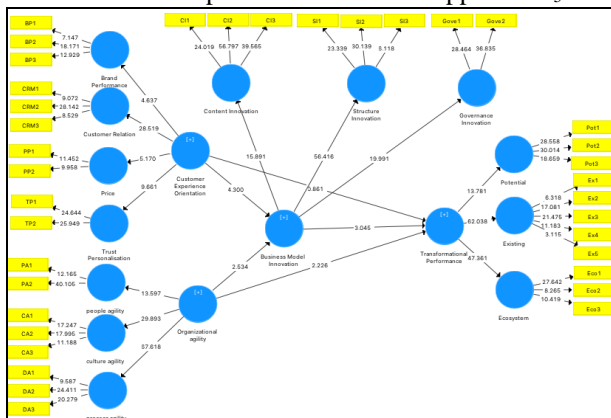


Figure 3. Structural Model Result

The result of hypothesis testing as follows:

Table 4. Testing of Hypothesis partially

	Hypothesis	Standard Deviation	T Statistics	P Values	Remarks
1	Customer Experience Orientation -> Business Model Innovation	0.146	4.300	0.000	Significant
2	Customer Experience Orientation -> Transformational Performance	0.202	0.861	0.389	No Significant
3	Organizational agility -> Business Model Innovation	0.134	2.534	0.011	Significant
4	Organizational agility -> Transformational Performance	0.164	2.226	0.026	Significant
5	Business Model Innovation -> Transformational Performance	0.227	3.045	0.002	Significant

* significant at (<=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

Hypothesis	Standard Deviation	T Statistics	P Values	Remarks
Customer Experience Orientation -> Business Model Innovation -> Transformational Performance	0.168	2.581	0.010	Significant
Organizational agility -> Business Model Innovation -> Transformational Performance	0.121	1.974	0.049	Significant

* significant at ≤ 0.05 (T statistics > 1.96)

V. 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.

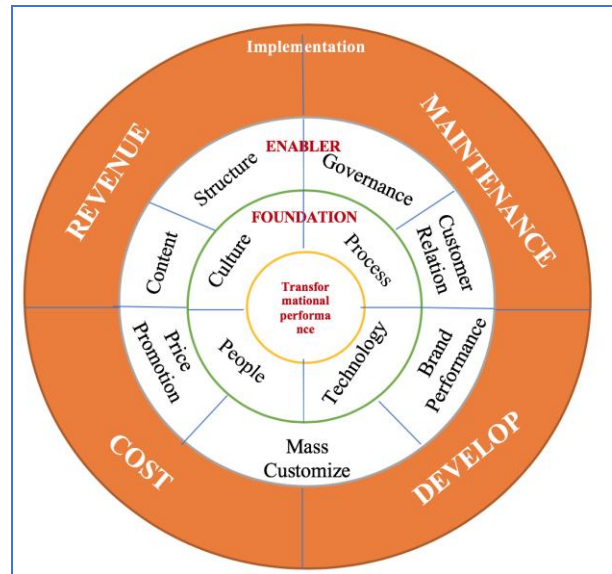


Figure 4. Experience-Agility Innovation Model

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.

VI. 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

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