

Research Paper

Technology Readiness and Digital Competing Capabilities: Digital Value Resonance

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ABSTRACT

The digital economy for MSMEs still possesses complex problems in the debate over technology readiness and competitive digital capabilities. The increase of dynamic product innovation changes is only effectively supported by digital value resonance. Addressing this issue, this research aims to explore the readiness of technology and the ability to compete digitally for innovative products through the resonance of digital value, especially for multi-business businesses. The data were collected from 170 respondents of small and medium-sized businesses through questionnaires. SEM-PLS techniques were used to analyze the data with a path mediated by digital value resonance on product innovation. The results showed that the resonance of digital value successfully mediated the relationship of technological readiness and digital competing capabilities, as well as direct links to the improvement of innovative products. Digital consumer habits also successfully strengthened the relationship of technological readiness and digital competing capabilities on the resonance of digital value. The advantages of this research lie in the synthesis of proposed digital value resonance variables from the results of resource-based view theory propositions in bridging the previous researcher gaps and contributing as a conceptual novelty model that can personalize digital value in the level of competition and increase MSMEs innovation products.

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Introduction

The dynamics of innovation diffusion coherently demand business behavior towards global technological inventions. The readiness of digital technology disrupts traditional

businesses, so it is necessary to breakthrough or stimulus digital competing capabilities in innovating. The insistence on the dissemination of technology readiness in small and medium enterprises according to Nugroho et al. (2017) stems from the habit of digital customers to obtain ease of use, accessibility and capital are factors that affect readiness in adopting information technology. The development of cloud computing technology in developing and developed countries focuses not only on large-scale industries but small-scale industries that have adopted e-commerce for retail and wholesale sales (Alam et al., 2011; Carcary et al., 2014; Ifinedo, 2011; Kurnia et al., 2015). An equally important discussion of the readiness of the adoption of this technology needs to be utilized to provide opportunities to expand the customer base, enter new product markets, and rationalize the business (Astuti & Nasution, 2014; Walker et al., 2016). Therefore, businesses must be able to resonate digital value to the market to overcome the problem of technological readiness and digital competitive capabilities on the needs of product innovation. Figure 1 demonstrates that, according to World Bank Enterprises survey (2006-2014), only 4.2 percent of small companies in Indonesia have their website. This is in stark contrast to other countries in the Southeast Asian region, such as the Philippines and Vietnam.

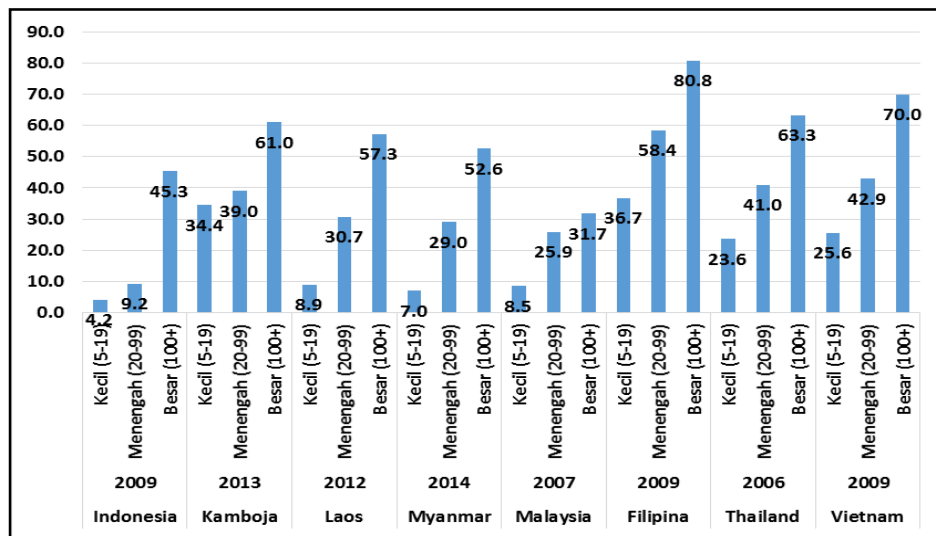


Figure 1. World Bank Enterprises Survey

In the resource theory by Barney et al. (2001) and Grant (1991), technology is one of the tangible resources that helps companies to explore opportunities for value creation or to avoid an environmental threat. In addition to the theoretical studies, according to Oliveira and Martins (2010) and Porter (2009), technology readiness includes professional skills, users, e-business, availability of the latest technology, absorption of technology by companies, PMA, internet users, broadband internet customers, and broadband internet. The role of technology becomes accustomed to changes in attitudes and enjoyment of consumption behavior (Handayani & Martini,

2014; Kusniadji, 2018; Rohimah, 2019; Sari, 2020a). Similarly, the theory of corporate resource learning initiated by Penrose (published 1959) cited again by Mahoney (1995) about two sources of corporate heterogeneity, namely resource connectivity and mental models can be intertwined.

The company's competitive strategy is an understanding of the competitive advantage it has over competitors, generating value for the organization, and doing so in a way that competitors cannot easily pursue (Barney, 1986, 1995). As technology evolves, the derivation of resource theory is refined in a comprehensive strategy that results in an online competing evolution strategy forcing real business actions to comply with customer demand and focus on long-term business continuity (Evans, 2001; Ilieva et al., 2002; Robertson & Yu, 2001; Weber & Polo, 2010). According to Bharadwaj et al. (2013) and Nguyen et al. (2015), the digital competition dimension consisting of digital business strategy and value creation. They further explains that the capabilities of online technology strategies positively affect product brand innovation. It also related to knowledge acquisition, market orientation, and brand innovation. Digital competing capabilities are also expected to stimulate innovation, technology, and dynamic capabilities. Therefore, the value of digital resonance is expected to echo the readiness and capability of competing technologies in a product innovation competition.

The current economic movement of MSMEs business is dominated by the influence of determining product innovation maneuvers simultaneously. There is a perspective that reflects the constellation of technological readiness forces that are important to businesses. As stated by Chang and Chen (2021), Lokuge et al. (2019), Okundaye et al. (2019), and Sun (2016), the role of digital innovation transforms the ease of use intentions of traditional systems towards high potential risk and provides a strong impact on the ease of transaction when businesses have a high level of technological readiness to earn rewards. Similarly, Halpern et al. (2021) state that organizational readiness can be used to accelerate the pace of innovation. The higher the technological readiness of each business assumes will improve the more product innovation. But behind the importance of technological readiness, there are inconsistencies in logical and practical perspectives that assume otherwise. Similarly, the opinion of Mohorčich & Reese (2019) states that the readiness of technology experienced by manufacturers is more due to consumer activism when sellers feel more pressured by buyers in the supply chain. Another inconsistency of the impact of technological readiness is that the influence of changing demographics and the approaching age of retirement which causes individual responses to decrease when facing technology retraining (Larwood et al., 1997). Another study from Ahn and Yoon (2020) states that the trappings of poverty or the economy of middle-income businesses

are obstacles encountered by the developing countries to explore product innovation opportunities.

Moreover, as pointed out by Malhotra and Hunt (2018), product innovation becomes a parameter of MSMEs to update their competencies to adapt to the current business environment. However, to the best of the authors' knowledge, no studies have contributed to offering a conceptual model with digital value resonance as a novelty, namely with the higher readiness of technology and digital competitive capabilities, the higher the resonance of digital value that can be echoed to the business environment. Digital value resonance is not a manifestation or result of technological readiness and digital competing capabilities but can be improved while businesses have high technological readiness and digital competing capabilities. Therefore, this research intends to shed some light on the importance of digital value resonance as a function of correlation that is of positive value to the improvement of innovative products. This research aims to provide solutions to the importance of resonating the digital value of MSMEs to be able to adapt to technological readiness and to be digitally competitive amid the increasing dynamics and sophisticated product innovations for business continuity.

Hypothesis Development

Technology Readiness, Digital Value Resonance, Product Innovation, and Digital Consumer Habits

Oliveira and Martins (2010) stated that the technology readiness factor is a significant facilitator for the adoption of e-commerce. Liljander et al. (2006) expressed a different opinion that technological readiness slightly affect a person or customer's attitude and behavior for technology adoption and evaluation. Liljander et al's. (2006) opinion can be a strong signal that the tendency to digital value resonance will run into obstacles. Technological readiness refers to people's tendency to embrace and use new technologies to achieve goals in life and at work, which can be seen from the four dimensions of personality, namely optimism, innovativeness, discomfort, and insecurity (Parasuraman, 2000).

The ability to produce innovative products is strongly supported by technological developments, such as technology-based companies can improve efficiency and effectiveness in producing products (Garcia & Calantone, 2002). Innovation technology-based products are a prerequisite to increase product innovation in terms of unique acculturation products (Sugiyarti et al., 2018). Integrated computers enable flaw-free design and manufacturing excellence changes; thus enhancing the frequency of innovation (Kessler & Chakrabarti, 1996).

Some researchers have suggested a link between technological orientation and product innovation as put forward by Yang et al. (2012) and Hortinha et al. (2011); that

is, there is a positive relationship between technology orientation and product innovation. Zhou et al. (2005) also stated that technology orientation has a positive relationship with technology-based innovation but slightly influence the category of market-based innovation. Khin and Ho (2019) in their research stated that digital orientation and digital capabilities directly affect digital innovation.

Alluding to how consumer habits in the digital era, a study conducted by Sari (2020b) has proven that consumers today have become accustomed to and enjoy online purchases very much. Goodfellow (2011) also stated that digital technology had become a vital need no matter how old a person is. The advent of digital device mobility became an integral part of people's lives and also increased three important factors, i.e. speed, connectivity, and networking (Rivoltella, 2008). The digital age has been marked by the emergence of the "Digital Natives" generation. How the behaviors and habits of the digital generation of natives have been put forward by Cabanero-Johnson and Berge (2009), i.e. they live, breathe, work, and play with the tools and products of the digital age and they use these tools quite uniquely. The impact of technological readiness on the tendency of one's attitude to embrace and use new technologies as stated by Parasuraman (2000) will certainly be better if it is supported by habitual factors towards digital products as stated by Cabanero-Johnson and Berge (2009) regarding how digital natives behave. The exposure can be used as a basis to predict that technological readiness will have a significant influence on digital value resonance if moderated by digital consumer habits.

H1: *Technology readiness has a negative influence on digital value resonance.*

H2: *Technology readiness has a negative influence on product innovation.*

H3: *Technology readiness has a positive influence on digital value resonance moderated by digital consumer habits.*

Digital Competing Capabilities, Digital Value Resonance, Product Innovation, and Digital Consumer Habits

The concept of digital competing capability requires a critical understanding of three complementary and side-by-side aspects, namely technology, cognitive and social fields. This field of technology is supported by the knowledge, skills, and attitudes needed to explore the context of new technologies and deal with technological problems in a flexible way (Ferrari, 2012). The cognitive field is supported by the knowledge, skills, and attitudes needed to read, select, interpret, evaluate data and information taken to account for accuracy and reliability (Calvani et al., 2008). So the argument can be predicted that digital competition capabilities can affect the resonance of digital value because it is closely related to the social aspect, where knowledge and skills are needed to interact with others collaboratively to use technology.

The close relationship between digital technology capabilities and product

innovation has been stated by researchers before. (Kristiansen et al., 2005), explained that media, including the internet, are used as a source of design and product innovation by small and medium enterprises (SMEs). (Khin & Ho, 2019) in their research also stated that digital orientation and digital capabilities directly affect digital innovation. The above statement is proposed to be the basis of the hypothesis that there is a link between digital competing capability and product innovation.

Aspects of digital capability understanding related to the social field as stated by Calvani et al. (2008), such as how the need to interact with others using technology, are supported by Rivoltella (2008) that the mobility of digital devices is inseparable from people's lives and can increase three important factors, namely speed, virtuality, and network. The need of fast social interaction through the mobility of digital devices today has become a habit of society, especially for those called digital natives generation. Someone familiar with digital technology will find it difficult to interact with others who are not familiar with digital technology media. The argument can be predicted that the correlation of digital competition capability in digital value resonance can be improved by the moderation of digital consumer habits.

H4: *Digital competing capabilities have a positive influence on digital value resonance.*

H5: *Digital competing capabilities have a positive influence on product Innovation*

H6: *Digital competing capabilities have a significant influence on digital value resonance moderated by digital consumer habits.*

Digital Value Resonance and Product Innovation

The existence of technology can accelerate the development of new products. The company's ability to produce high technology and products with applied technology greatly affect the excellence of the products (Li & Calantone, 1998). Wind and Mahajan (1997) stated that technology is one of the factors that influence the success of new products, whereby by using advanced technology, companies can create better products and innovations. From that opinion, a consumer, organization, or company in the digital age will tend to be difficult to produce innovative products if there is no effort to resonant with the value of digital technology in the era of industry 4.0 today.

Sugiyarti et al. (2018) also asserted that innovation technology-based products are a prerequisite for improving product innovation. Technology is the trigger for innovation, where companies are required and triggered to innovate in echoing the values of digital products according to the needs of the industrial era 4.0. Proof of the need for digital value is the emergence of the digital native's generation as revealed by Cabanero-Johnson and Berge (2009) should be the reason for product/service providers to produce innovative products that are always oriented to digital technology. Based on the exposure, the readiness of technology that is then followed up by digital value resonance efforts will affect product innovation.

As well as technological readiness, digital technology capabilities are needed in the aspect of product innovation as described by Garcia and Calantone (2002), that to produce innovative products must be supported by the development of technology. The opinion of Kristiansen et al. (2005) is also very relevant where the media, including the internet, is used as a source of product innovation and design. The importance echoes the value of digital to provide added value to the relationship between technological capabilities and product innovation because many aspects related to technology and product innovation still have to involve the role of many parties.

H7: *Digital value resonance has a positive influence on product innovation.*

H8: *Technology readiness has a significant influence on product innovation through digital value resonance*

H9: *Digital competing capabilities have a significant influence on product innovation through digital value resonance.*

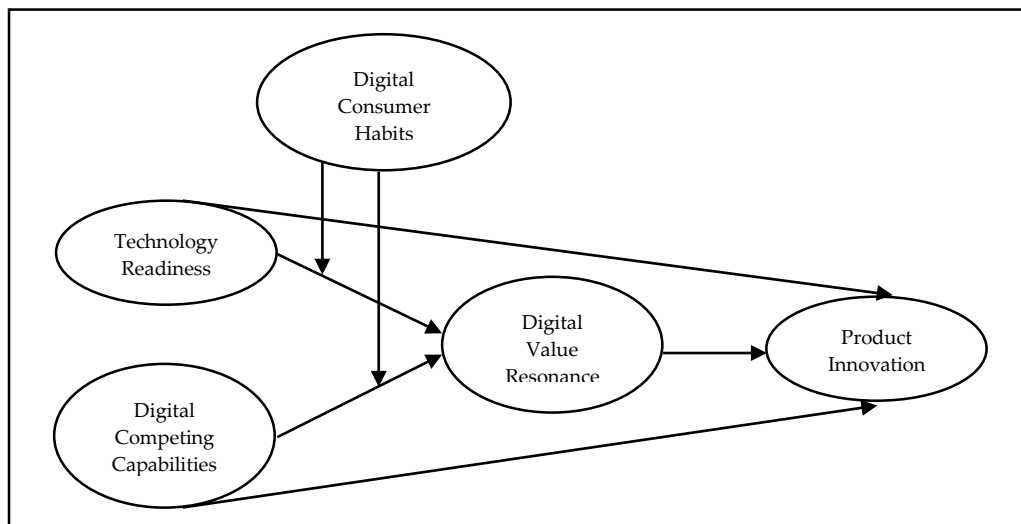


Figure 2. Research Model

Method

Population and Samples

This study aims to explain the role of technological readiness and the ability to compete digitally for innovative products through digital value resonance. The information of population in this study is shown in Table 1. We use the convenience method for sampling. Respondents were given instruments in the form of online closed questionnaires to measure their perception of the digital value they used to innovate their products. Questionnaires are distributed online to actors of businesses and MSMEs located on the island of Java for a period of 2 months, namely from November to December 2020. During this period 170 respondents were selected for further

statistical analysis. The number of samples is considered sufficient for research methods using SEM- PLS (Hair et al., 2012; Kock & Hadaya, 2018).

Table 1. Demographic Information of the Respondents

| No. | Characteristics | Total | % | |
|-----|--------------------------|-----------------------------------|-----|------|
| 1. | Sex | Male | 64 | 37,5 |
| | | Female | 106 | 62,5 |
| 2. | Age | < 20 years | 27 | 16,2 |
| | | > 20-30 years | 40 | 23,5 |
| | | > 30-40 years | 90 | 52,9 |
| | | > 40-50 years | 9 | 5,1 |
| | | > 50 years | 4 | 2,2 |
| 3. | Education | Senior High School | 24 | 13,2 |
| | | Bachelor Degree | 104 | 61,0 |
| | | Master Degree | 38 | 22,1 |
| | | Doctoral Degree | 4 | 2,2 |
| 4. | The duration of business | < 3 years | 4 | 2,2 |
| | | > 3-5 years | 17 | 10,3 |
| | | > 5-10 years | 9 | 5,1 |
| | | > 10 years | 140 | 82,4 |
| 5. | Income /month | < Rp 10 Million | 1 | 0,7 |
| | | > Rp 10 Million – Rp 25 Million | 9 | 11,0 |
| | | > Rp 25 Million – Rp 100 Million | 146 | 86,0 |
| | | > Rp 100 Million – Rp 200 Million | 3 | 1,5 |
| | | > Rp 200 Million | 1 | 0,7 |
| 6. | Type of Business | Online Business | 111 | 65,4 |
| | | Manufacture | 4 | 2,2 |
| | | Culinary | 26 | 15,4 |
| | | Others | 29 | 17,0 |

Variable Measurement

Variable measurement items are adapted from previous research with modifications in adjusting to research objectives. All variables are measured using a five-point Likert scale, from Strongly Disagree to Strongly Agreeable. Research variables and their measurement indicators can be seen in Table 2.

Table 2. Operational Definition of Variables

| Construct | Question | Dimension/Indicator | References |
|----------------------|----------|--|---|
| Technology readiness | 4 items | - Optimism - Innovation - Discomfort - Insecurity | (Parasuraman & Colby, 2015), (Rojas-Méndez et al., 2017), (Sani et al., 2020) |

| Construct | Question | Dimension/Indicator | References |
|------------------------------|----------|--|---|
| Digital competing capability | 7 items | <ul style="list-style-type: none"> - Technology capability - Dynamic capability - Innovation capability - Digital economy trends - Digital business strategy - Digital strategic transformation - Digital economy information | (Lawson & Samson, 2001), (Yeh et al., 2015), (Arifin & Frmanzah, 2015), (Bharadwaj et al., 2013), (Matt et al., 2015), (Pagani, 2013), (Joshi et al., 2015), (Şoavă et al., 2014) |
| Digital value resonance | 4 Items | <ul style="list-style-type: none"> - Ability to design technology-based systems - Technology-based marketing configuration skills - Speed predicting opportunities for technology-based ideas - Uniqueness of sales points | (Sok et al., 2013), (Arifin et al., 2018), (Zhou et al., 2005) |
| Product innovation | 3 items | <ul style="list-style-type: none"> - Motivation for innovation development and product ideas - Product evaluation from customers and suppliers - Adaptation to environmental change | (Zhang & Qu, 2020), (Jaeger et al., 2017) (Ramkumar & Kulkarni, 2016) |
| Digital consumer habits | 6 items | <ul style="list-style-type: none"> - Dynamic - Experience - Multichannel - Artificial Intelligence - Mobilization - Product Sustainability | (Saura, 2020), (Bissell, 2020), (Met et al., 2020) |

Data Analysis

The research model was analyzed using the SEM-PLS (Structural Equation Model-Partial Least Square) technique with smart PLS 3.0 software. SEM-PLS techniques can work effectively on small sample sizes with complex models. Also, SEM Techniques can test the effects of mediation simultaneously (Tabachnick & Fidell, 2012). Model testing on SEM-PLS is conducted in two stages, namely testing the measurement model (outer model) and structural model (inner model).

Measurement Model

Measurement model testing consists of a test of the validity and reliability of the construct. The validity test consists of convergent validity and discriminant validity. The validity of convergence is used to assess the correlation between two sizes of the

same concept. The loading factor value calculates the measurement of convergent validity of the reflective construct and the Average Variance Extracted (AVE) value which is the sum of squared standardized factors divided by the number of measurement items. The validity of convergence requires a loading factor value of 0.7, and the AVE value must be higher than 0.5 (Hair et al., 2014). While the validity of the discriminant is measured by comparing the AVE value of both constructs with the square of the correlation between the two constructs tested. Discriminant validity is an assessment of how different a construct is from another. According to the Fornell & Larcker (Fornell & Larcker, 1981) criteria, the square root of each construct's AVE value must be higher than the correlation value between constructs in a model.

Reliability tests are used to determine the consistency of measurement results if measurements are performed twice or more of the same symptoms with the same measuring instrument. Reliability testing loading rules meet composite reliability criteria, and Cronbach's alpha is higher than 0.7; where 0.6 is still acceptable (Hair et al., 2014).

Structural Model

The structural model in this study was conducted to predict causality relationships between latent variables. The parameters used for model tests are the R-Square (R^2) value and the predictive relevance model (Q^2). The high R^2 value reflects a better research model, while Q^2 shows the level of results of the model as well as the estimated parameters that are well assessed from the observations made. The degree of significance in hypothesis testing is indicated by the value of the path coefficient (inner model). The loading rule of the path coefficient value indicated by the t-statistical value must be higher than 1.96 for the two-sided hypothesis in hypothesis testing using alpha 5% (Hair et al., 2012).

Results

Result of Measurement Model Test

Based on validity and reliability testing, all items meet the requirements. All items on a variable have a loading factor value above 0.7 and an AVE value higher than 0.5. Reliability tests show composite reliability values and Cronbach's alpha > 0.7 on all constructs. Thus it can be said that all variables in this study are valid and reliable. Validity and reliability test results are presented in Table 3.

Also, based on the testing of discriminant validity shows that all constructs in this research model have met the requirements. For each construct tested, the AVE square root value is higher than the correlation between constructs. This indicates that the validity of the discriminant is reached. The results of the discriminant validity test can be seen in Table 4.

Table 3. Validity and Reliability Testing

| Variable | Indicator | STD. Loading | P-values \leq 0.05 | Status |
|--|-----------|--------------|-------------------------|--------|
| Technology readiness (X_1) AVE = 0.889 CRI = 0.969 | $X_{1.1}$ | 0.961 | 0.000 | Valid |
| | $X_{1.2}$ | 0.936 | 0.000 | Valid |
| | $X_{1.3}$ | 0.916 | 0.000 | Valid |
| | $X_{1.4}$ | 0.959 | 0.000 | Valid |
| Digital competing capability (X_2) AVE = 0.916 CRI = 0.982 | $X_{2.1}$ | 0.965 | 0.000 | Valid |
| | $X_{2.2}$ | 0.955 | 0.000 | Valid |
| | $X_{2.3}$ | 0.954 | 0.000 | Valid |
| | $X_{2.4}$ | 0.940 | 0.000 | Valid |
| | $X_{2.5}$ | 0.970 | 0.000 | Valid |
| Digital value resonance (Y_1) AVE = 0.915 CRI = 0.977 | $Y_{1.1}$ | 0.930 | 0.000 | Valid |
| | $Y_{1.2}$ | 0.934 | 0.000 | Valid |
| | $Y_{1.3}$ | 0.981 | 0.000 | Valid |
| | $Y_{1.4}$ | 0.980 | 0.000 | Valid |
| Product innovation (Y_2) AVE = 0.939 CRI = 0.979 | $Y_{2.1}$ | 0.957 | 0.000 | Valid |
| | $Y_{2.2}$ | 0.984 | 0.000 | Valid |
| | $Y_{2.3}$ | 0.965 | 0.000 | Valid |
| Digital consumer habits (Z) AVE = 0.525 CRI = 0.812 | $Z_{.1}$ | 0.757 | 0.000 | Valid |
| | $Z_{.2}$ | 0.575 | 0.000 | Valid |
| | $Z_{.3}$ | 0.867 | 0.000 | Valid |
| | $Z_{.4}$ | 0.668 | 0.000 | Valid |
| R-square (R^2) – Y_1 | 0,939 | | | |
| R-squared (R^2) – Y_2 | 0,965 | | | |
| Predictive relevance (Q^2) | 0,904 | | | |

Table 4. Discriminant Validity

| Variable | Tr | Dcc | Dvr | Pi | Dch |
|--|--------------|--------------|--------------|--------------|--------------|
| Technology readiness (Tr) (X_1) | 0.943 | | | | |
| Digital competing capability (Dcc) (X_2) | 0.893 | 0.957 | | | |
| Digital value resonance (Dvr) (Y_1) | 0.876 | 0.902 | 0.956 | | |
| Product innovation (Pi) (Y_2) | 0.855 | 0.947 | 0.913 | 0.969 | |
| Digital consumer habits (Dch) (Z) | 0.129 | 0.125 | 0.106 | 0.132 | 0.717 |

Result of Structural Model Test

Structural model test results showed that the Q^2 digital value resonance was 90.4%. This suggests that the research model is good. Based on the results of statistical tests conducted with bootstrap analysis, the 5 hypotheses of direct influence submitted are all confirmed. The construct directly affects digital value resonance as well as product innovation. The influence of technology readiness (1,364) has a significant negative effect on digital value resonance and (0.249) on product innovation with p-value < 0.05

respectively so that H1 and H2 are confirmed. Digital competing capability has a positive and significant direct influence on Digital value resonance (2,317) and Product innovation (1,047) and confirms H4 and H5. Furthermore, the direct influence of digital value resonance variable (0.171) on product innovation is a significant positive with a p-value < 0.10 so that H7 is not rejected.

Furthermore, the 4 hypotheses of indirect influence of both moderation and mediation are all confirmed at p-value < 0.05 and p-value < 0.10. Variable digital consumer habits (2,380) moderate positively and significantly technology readiness against digital value resonance, while moderation (2,556) of technology readiness to digital value resonance is negative and significant, and H3 and H6 are confirmed. Also, variable digital value resonance (0.233) can mediate the influence of technology readiness on product innovation and also able to mediate (0.340) the influence of digital competing capability on product innovation. Therefore, these results support H8 and H9.

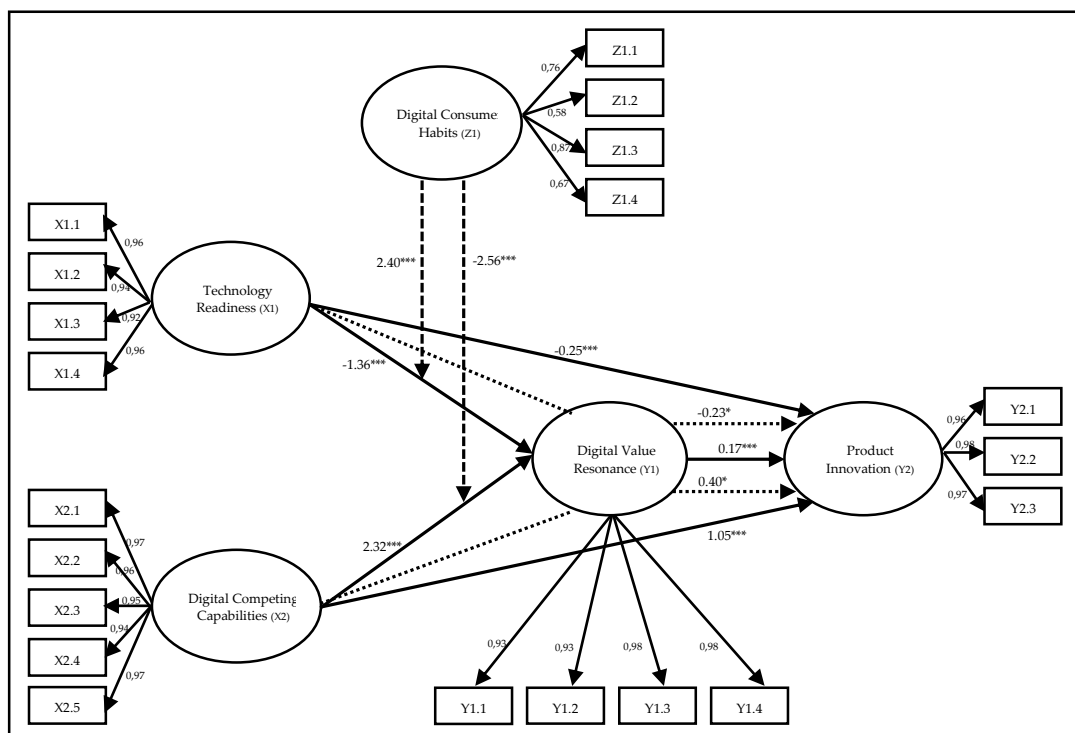


Figure 3. Structural Model of Digital Value Resonance and Product Innovation

Information:

- > : Direct effect
- - -> : Moderation effect
-> : Mediation effect
- > : Reflective indicator

Table 5. Hypothesis Testing Results

| Hypothesis | Direct & Indirect Effect | Estimate | T-Value | Result |
|------------|--------------------------------|------------|---------|-----------|
| H1 | Tr (X1) → Dvr (Y1) | -1.3639*** | 4.3346 | Supported |
| H2 | Tr (X1) → Pi (Y2) | -0.2494*** | 2.8809 | Supported |
| H3 (Mo) | Tr (X1) * Dch (Z1) → Dvr (Y1) | 2.3793*** | 4.8593 | Supported |
| H4 | Dcc (X2) → Dvr (Y1) | 2.3172*** | 8.1237 | Supported |
| H5 | Dcc (X2) → Pi (Y2) | 1.0474*** | 10.9994 | Supported |
| H6 (Mo) | Dcc (X2) * Dch (Z1) → Dvr (Y1) | -2.5558*** | 5.0148 | Supported |
| H7 | Dvr (Y1) → Pi (Y2) | 0.1705* | 1.5485 | Supported |
| H8 (Me) | Tr (X1) → Dvr (Y1) → Pi (Y2) | -0.2325* | -1.4250 | Supported |
| H9 (Me) | Dcc (X2) → Dvr (Y1) → Pi (Y2) | 0.3951* | 1.5102 | Supported |

Note: All *t*-statistics are sig. at $p < 1\%$ (***); 5% (**); 10% (*).

Mo = Moderation effect; Me = Mediation effect.

Tr = Technology readiness; Dcc = Digital competing capability; Dvr = Digital value resonance; Pi = Product innovation; Dch = Digital consumer habits.

Discussion

The results showed that technology readiness has a negative influence on digital value resonance to improve product innovation capabilities. MSMEs businesses with low technological readiness need to echo digital value, so that product innovation can be improved. The resonance of digital value in this study became the determining factor even though MSMEs businesses are not ready to adopt the technology. This study empirically reinforces the findings of Liljander et al. (2006) where technology readiness slightly contributes to the adoption of technology. Clausing and Holmes (2010), Demirci and Ersoy (2008), Westjohn et al. (2009) found that technological readiness makes business owners easily adopt and use technology so that it supports decisions and improves product performance on a technology basis. The factor that encourages MSMEs businesses to increase the resonance of digital value is that MSMEs believe digital business transformation strategies can be future business opportunities. Digital consumer habits have an important role for MSMEs who sell products online, making it profitable for those who adopt and use technology on products.

The results of this study also showed that technological readiness has an indirect influence in innovating products through digital value resonance. Business opportunities on digital transformation, uniqueness of products produced, accurate product design, and ease of selling products through digital technology can support the readiness of MSMEs businesses in the adoption and use of technology and motivate them to innovate products. This research empirically proves that digital value factors determine the readiness of the technology for MSMEs businesses in facing the market.

Similarly, Garcia and Calantone (2002), Cabanero-Johnson and Berge (2009), Sugiyarti et al. (2018) prove the positive effects of digital value resonance such as native digital generation habits on the adoption and use of technology in producing innovative products. Therefore, the digital value or benefits of technology must continue to be echoed, which further allows MSMEs businesses to innovate on products to be marketed.

Different results in MSMEs businesses with digital competing capability, which has a positive and significant effect on digital value resonance. Businesses with high digital concepts need to be supported with the knowledge, skills, and attitude to explore the context of new technologies and require interaction with others together in using technology. This must certainly be done by MSMEs businesses in meeting the technological, cognitive, and social aspects of the concept of digital competing capability, to resonate digital value. With digital competing capability owned by MSMEs businesses, giving them a coherent framework to develop and manage capabilities in a way that will build competitive advantage. Empirically this result reinforces the opinion of Calvani et al. (2008), Ferrari (2012), and Teece (2013) findings, where a close relationship can occur between the improvement of digital capability indicators and the advantages in competing from the use of digital technology. Furthermore, this significant influence gets a negative response when it is present in consumers with low digital habits. This can happen if consumers have strong control beliefs about factors that inhibit behavior in accepting and absorbing new technologies. Low perception of the development of digital technology can decrease the ability to compete digitally for MSMEs even though it has echoed digital values. These results are reinforced by the findings of Afriani and Halmawati (2019), Paramita et al. (2018), which states that overconfidence towards knowledge leads to self-restriction of technology adoption and decision-making of new things.

Digital competing capabilities owned by MSMEs businesses are also able to increase product innovation. MSME businesses with technology capabilities, dynamic capabilities, and proven innovation capabilities will be quickly motivated to develop and implement new product ideas. The results of this study are following the findings of Zhou and Li (2010), Bughin and Zeebroeck (2017), Khin and Ho (2019), where digital competing capabilities are needed to integrate digital technology with professional digital talent. From this research, digital competing capabilities can be considered as dynamic capabilities, which are described as the ability of organizations or MSMEs to innovate new products.

The results of this study also found that digital competing capability can improve the product innovation capabilities of MSMEs businesses by resonating digital values. However, the result of this indirect influence obtained a lower value (0.395) compared

to the direct effect (1,047) indicating the partial mediation effect of digital value resonance to fill the gap between digital competing capability and innovation product. Thus, this finding emphasizes that the potential of real digital value resonance can mediate MSMEs to optimize product innovation. Most of the respondents in this study were online business actors with a turnover between IDR 25 million to IDR 100 million. It means that some types of real businesses increase their revenue by adopting technology, the resonance of digital value, and can compete digitally in improving product innovation.

Implication

Dissemination and literacy of digital product technology create competitiveness, both local, national and foreign MSMEs. Indonesia's growing population makes it a potential market share for MSMEs in offering contemporary innovations through the benefits of technology. Almost nowadays all promotional media is done through technology media. It is very important to know the driving factors of technological readiness so that the potential market share is increasingly competing to offer different products to be manufacturers that contribute to consumers.

The explanation of this study describes that respondents as potential business actors know about digital technology, but from demographic character, subject, and objectivity, not all are able to respond the emergence of technology. This shows that MSMEs businesses are not fully able to operate all the latest technological features that exist in the market today. Readiness is an important factor during the boom of advanced technology that is increasingly updated. Digital consumer behavior has a positive implication on the demands of ease and speed of access to demand MSMEs to synergize to have competitiveness in product innovation changes. Therefore, from the limitations of operational capabilities, efforts to promote digital value through intelligent features can improve the digital competence of users who are oriented to product innovation.

Conclusion

In conclusion, this study concentrates on investigating the factors that drive the readiness of competitive technology to improve innovative products in MSMEs. From the results of statistical tests, it was revealed that the impact of technological readiness and digital competitive capabilities have a significant positive effect to make changes to the improvement of innovation. Critical factors in this research seek to echo the value of digital at the level of technological readiness and certainly have competitiveness competencies. These results show that the main determining factor in echoing the value that exists in digital technology is so important in the face of the dynamics of innovation diffusion and practical oriented to the needs of consumer services. The higher the level of technological readiness felt the higher the value of digital resonance to be

disseminated. On the contrary, the lower the readiness of technology will affect decreasing product innovation, so the resonance of digital value can bridge the digital values of the relationship of readiness and digital competitive capabilities. This study successfully revealed that digital consumer habits can strengthen the response of technological readiness and competitive capabilities in absorbing digital values in product innovation. Digital technology service providers can take advantage of the findings of this study. Therefore, optimization of digital value resonance which in turn will have an impact on improving the maneuverability of the latest product innovations. Thus, the presence of digital value resonance can echo the value of digital technology for MSMEs and digital consumers.

Current research has some limitations. First, the sample size is relatively small which is less than 200 respondents, and respondents are still focused on Java Island. Second, the characteristics of respondents are still dominated by tech-savvy millennial, so understanding the use of technology features is better than parents'. About these limitations, generalizing the findings of the study requires broader dissemination. The study recommends that future researchers should investigate the role of augmented reality technology in empowering local brands in dealing with foreign brands and explore the effects of moderators. It was found that most respondents knew about technology but we're not all yet able to create a competitive technology medium to meet their business. Furthermore, this study suggests future studies to include variable information technology dexterity influenced by market sensing capabilities and brand management capabilities in improving the productivity of MSMEs business performance.

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Authors' Declaration

The authors made substantial contributions to the conception and design of the study. The authors took responsibility for data analysis, interpretation and discussion of results. The authors read and approved the final manuscript.

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Technology Readiness and Digital Competing Capabilities : Digital Value Resonance

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34

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Abstract

This research aims to explore the readiness of technology and the ability to compete digitally for innovative products through the resonance of digital value, especially for multi-business businesses. Respondent data was collected from 170 small and medium-sized businesses through questionnaires and interviews. Sem-PLS techniques are used to analyze data with a path mediated by digital value resonance on product innovation. The results showed that the resonance of digital value successfully mediated from the relationship of technological readiness and digital competing capabilities, as well as direct links to the improvement of innovative products. Digital consumer habits also successfully strengthen the relationship of technological readiness and digital competing capabilities on the resonance of digital value. The advantages of this research lie in the synthesis of proposed digital value resonance variables from the results of resource-based view theory propositions in bridging previous researcher gaps and contributing as a conceptual novelty model that can personalize digital value in the level of competition and increase MSME innovation products.

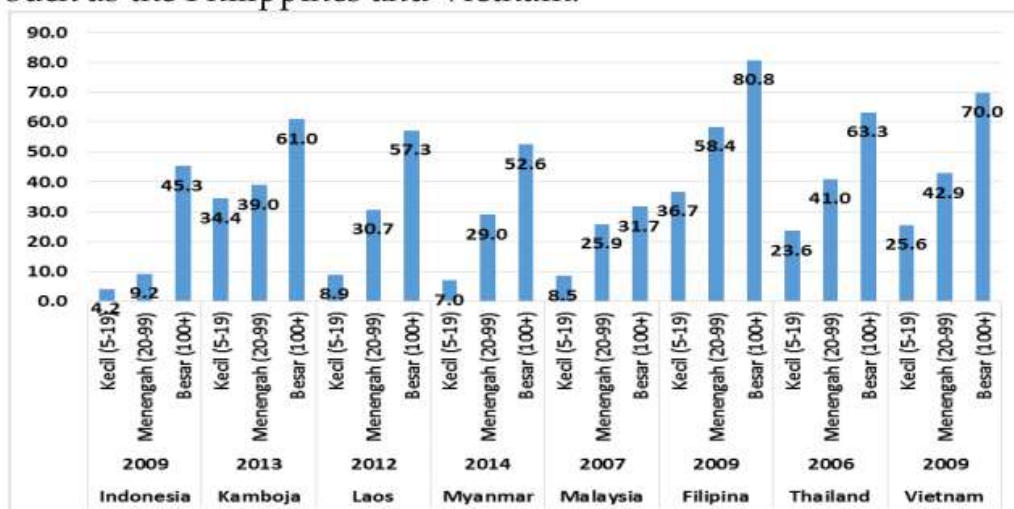
Keywords: Technology Readiness; Digital Competing Capabilities; Digital Value Resonance; Innovation Products; Digital Consumer Habits.

Introduction

Dinamika difusi inovasi secara koheren menuntut perilaku usaha menuju invensi teknologi global. Kesiapan teknologi digital menimbulkan gangguan bagi pelaku bisnis tradisional, maka perlu terobosan atau stimulus kapabilitas bersaing digital dalam berinovasi. Desakan diseminasi kesiapan teknologi pada usaha kecil dan menengah menurut Nugroho et al., (2017) berasal dari kebiasaan pelanggan digital untuk memperoleh kemudahan penggunaan, aksesibilitas dan modal adalah faktor yang mempengaruhi kesiapan dalam mengadopsi teknologi informasi. Perkembangan teknologi cloud computing di negara berkembang dan maju tidak hanya berfokus pada industri skala besar, namun industri skala kecil sudah mengadopsi e-commerce untuk penjualan retail maupun grosir (Alam et al., 2011; Carcary et al., 2014; Ifinedo, 2011; Kurnia et al., 2015). Hal yang sama pentingnya pembahasan kesiapan adopsi teknologi ini perlu dimanfaatkan untuk memberikan peluang memperluas basis pelanggan, memasuki pasar produk baru, dan merasionalisasi bisnis (Astuti & Nasution, 2014; Walker et al., 2016). Oleh sebab itu pelaku usaha harus mampu meresonansi nilai digital kepada pasar untuk mengatasi masalah kesiapan teknologi dan kapabilitas bersaing digital pada kebutuhan inovasi produk. Berikut gambar diagram dibawah ini dari perusahaan kecil di Indonesia hanya 4,2 persen yang memiliki website sendiri. Hal ini sangat kontras dengan negara lain di kawasan Asia Tenggara, misalnya Filipina dan Vietnam.

The dynamics of innovation diffusion coherently demand business behavior towards global technological inventions. The readiness of digital technology disrupts traditional businesses, so it is necessary to breakthrough or stimulus digital competing capabilities in innovating. The insistence on the dissemination of

technology readiness in small and medium enterprises according to (Nugroho et al., 2017) stems from the habit of digital customers to obtain ease of use, accessibility and capital are factors that affect readiness in adopting information technology. The development of cloud computing technology in developing and developed countries focuses not only on large-scale industries but small-scale industries that have adopted e-commerce for retail and wholesale sales (Alam et al., 2011; Carcary et al., 2014; Ifinedo, 2011; Kurnia et al., 2015). An equally important discussion of the readiness of the adoption of this technology needs to be utilized to provide opportunities to expand the customer base, enter new product markets, and rationalize the business (Astuti & Nasution, 2014; Walker et al., 2016). Therefore, businesses must be able to resonate digital value to the market to overcome the problem of technological readiness and digital competitive capabilities on the needs of product innovation. Here's a diagram below from a small company in Indonesia only 4.2 percent have their website. This is in stark contrast to other countries in the Southeast Asian region, such as the Philippines and Vietnam.



Source: World Bank Enterprises Survey

Note: The data year for each country varies. Indonesia, the Philippines, and Vietnam used 2009 data; Malaysia in 2007; Laos in 2012, Cambodia in 2013; Myanmar in 2014.

In resource theory by (J. Barney et al., 2001; Grant, 1991) technology is one of the tangible resources that helps companies to explore opportunities for value creation for or avoid an

environmental threat. Similarly, the theory of corporate resource learning initiated by Penrose (published 1959) cited again by (Mahoney, 1995) about two sources of corporate heterogeneity, namely resource connectivity and mental models can be intertwined. The company's competitive strategy in the digital age begins with an understanding of competitive advantage as an advantage over competitors, generating value for the organization, and doing so in a way that competitors cannot easily pursue (J. B. Barney, 1986, 1995). As technology evolves, the derivation of resource theory is refined in a comprehensive strategy that results in an online competing evolution strategy forcing real business actions to comply with customer demand and focus on long-term business continuity (Evans, 2001; Ilieva et al., 2002; Robertson & Yu, 2001; Weber & Polo, 2010). Thus the digital competition dimension consisting of digital business strategy, value creation by (Bharadwaj et al., 2013) and (Nguyen et al., 2015) explains the capabilities of online technology strategy to positively influence product brand innovation and correlate between knowledge acquisition, market orientation, and brand innovation. Digital competing capabilities are also expected to stimulate innovation, technology, and dynamic capabilities. Therefore, the value of digital resonance is expected to echo the readiness and capability of competing technologies in a product innovation competition.

The economic movement of MSMEs business lately is dominated by the influence of determining product innovation maneuvers simultaneously. There is a perspective that reflects the constellation of technological readiness forces that are important to businesses, as stated by (Chang & Chen, 2021; Lokuge et al., 2019; Okundaye et al., 2019; Sun, 2016) the role of digital innovation transforms the ease of use intentions of traditional systems towards high potential risk and provides a strong impact on the ease of transaction when businesses have a high level of technological readiness to earn rewards. Similarly, too (Halpern et al., 2021)

organizational readiness can be used to accelerate the pace of innovation. The higher the technological readiness of each business assumes will improve the more product innovation. But behind the importance of technological readiness, there are inconsistencies in logical and practical perspectives that assume otherwise. Similarly, the opinion (Mohorčich & Reese, 2019) the readiness of technology experienced by manufacturers is more due to consumer activism when sellers feel more pressured by buyers in the supply chain. Another inconsistency of the impact of technological readiness is that the influence of changing demographics and the approaching age of retirement causes individual responses to decrease when faced with technology retraining (Larwood et al., 1997). Another study from (Ahn & Yoon, 2020) states the trappings of poverty or the economy of middle-income businesses are obstacles facing developing countries to explore product innovation opportunities.

Another view in the research (Malhotra & Hunt, 2018) product innovation becomes a parameter to update or renewal competencies that allow MSMEs to affect the environment and change or update themselves to better suit the environment. Some researchers focus on the relationship of the utilization of digital technology and competing strategies on the orientation of sales performance or product innovation. However, no researcher has contributed to offering a conceptual model with digital value resonance as a novelty, namely with the higher readiness of technology and digital competitive capabilities, the higher the resonance of digital value that can be echoed to the business environment. Digital value resonance is not a manifestation or result of technological readiness and digital competing capabilities but can be improved while businesses have high technological readiness and digital competing capabilities. The higher the readiness of technology and the ability to compete digitally, the higher the resonance of digital value that can be echoed to the business environment. Therefore, this intense study discussed the

importance of digital value resonance as a function of correlation that is of positive value to the improvement of innovative products. This research aims to provide solutions to the importance of resonating the digital value of MSMEs to be able to adapt to technological readiness and be more able to be digitally competitive amid increasingly dynamic and sophisticated product innovations for business continuity.

Review of Literature

Technology Readiness

The readiness of MSMEs in the era of revolution 4.0 stated that MSMEs are classified as ready in the face of the Industrial 4.0 era caused by the number of young MSMEs who can adapt and capture opportunities for current development and market demand (Rianita and Deri, 2019). This can be predicted from the level of readiness of digitalization at the level of MSMEs companies by adopting the technological readiness index (TRI) and Technological Organization Environment (TOE) framework. TRI was developed by Parasuraman (2000) to measure the tendency of users in using the latest technology, consisting of 4 constructs, namely: optimism, innovation, discomfort, and insecurity of new technologies. A study conducted by Lefebvre et al. (1991) found that four factors determine the adoption of new technologies by SMEs, namely characteristics, SME competition management strategies, the influence of internal and external parties in the adoption decision-making process, and the characteristics of new technologies to be adopted.

Technological readiness refers to people's tendency to embrace and use new technologies for work needs, which can be seen from four personality dimensions namely optimism, innovativeness, discomfort, and insecurity (Parasuraman, 2000). Veronika Liljander et al. (2006) stated that technology readiness has very little impact on customer attitudes towards adoption behavior and evaluation of self-service technologies. The pillar of technology readiness has six

variables consisting of the availability of the latest technology, the absorption of technology by companies, PMA and technology transfer, internet users, broadband internet customers, and broadband internet (Porter & Schwab, 2008). Oliveira & Martins (2010) found that the technology readiness factor is a significant facilitator for the adoption of e-commerce, and they further stated that technological readiness includes professional skills, user skills, and e-business skills.

Digital Competing Capabilities

The market function after the company's operating costs can be changed with the presence of digitization (Bush, 2010). Deloitte Access Economics (2015), stated that the use of digital technology more specifically for SMEs digitally can increase annual economic growth for Indonesia by 2%. Businesses that have adequate digital competency capabilities have an important impact on the company's competitiveness and potentially improve e-business (Vieru et al., 2015). The advantages of digital competition consist of aspects such as technical capabilities, implementing technology and digital to support all activities of life, having a critical attitude to existing digital technologies, and having a tendency to contribute and commit to digital culture (Ilomäki et al., 2016).

Online digital capabilities facilitate the exchange of ideas, products, and services that provide satisfaction to both parties (Mohammed et al., 2003). Jauhari (2010) stated that e-commerce used for online marketing and sales will certainly increase the volume of profit-oriented sales to grow small and medium-sized businesses. Reinforced statements from (Stelzner, 2012) through social networks have the potential to help SMEs in marketing their products and services.

Digital Value Resonance

The behavior of digital society in the millennial era is

synonymous with every activity driven through a series of digital technologies. Digital transformation has implications for many sectors of the business such as changing the way they work, communicating, and also changing patterns of consumer behavior (Aral et al., 2013; McDonald and Russel-Jones, 2012). Put forward by Lankshear and Knobel (2008) digital transformation is the third and highest level of digital skills achieved when the value of innovation and creativity is facilitated in the use of digital to make a significant contribution in the field of professional or knowledge.

The role of technology has become an opiate for changes in attitudes and behaviors of consumption (Rohimah, 2019; Alriani, 2014; Kusniadji, 2018). Santi Permata Sari (2020), in his research findings, stated that consumers today have become accustomed to online purchases, and they enjoy it very much. "Enjoy" refers to the indicator: the difference of getting ease and making them opiate, consumers enjoy time with family and rest, many offer cheaper prices, payment methods according to what is desired, service is more friendly.

Product Innovation

Innovation is defined "as the introduction of something new and useful in product, processes, or service", which means innovation is to produce something new and valuable, whether in a product, process, or service (Hernandez, 2010). Hurley and Hult (1998) define innovation as a mechanism for companies to adapt in a dynamic environment, therefore companies are required to be able to create new ideas and ideas and offer innovative products to improve service that satisfies customers. In the Law of the Republic of Indonesia article 1 explains that innovation is the result of thought, research, development, assessment, and/or application, which refers to the element of novelty and has been applied and provides benefits, economic, and or social.

Hyphothesis Development

Vol. x No. x, Month - Month Year

Technology readiness, digital value resonance, product innovation, and digital consumer habits

Oliveira & Martins (2010) stated that the technology readiness factor is a significant facilitator for the adoption of e-commerce. Veronika Liljander et al. (2006) expressed a different opinion than technological readiness has very little impact on a person or customer's attitude to behavior for technology adoption and evaluation. Veronica Liljander's opinion, et.al (2006) can be a strong enough signal that the tendency to resonance digital values will run into obstacles. Technological readiness refers to people's tendency to embrace and use new technologies to achieve goals in home life and at work, which can be seen from the four dimensions of personality namely optimism, innovativeness, discomfort, and insecurity (Parasuraman, 2000).

The ability to produce innovative products is very strong supported by technological developments, such as technology-based companies can improve efficiency and effectiveness in producing products (Garcia and Calantone, 2002). Innovation technology-based products are a prerequisite to increase product innovation in terms of unique acculturation products (Sugiarti et al., 2018). Integrated computers enable flaw-free design and manufacturing excellence changes, thus helping the frequency of innovation (Kessler and Chakrabarti, 1996).

Some researchers have suggested a link between technological orientation and product innovation as put forward by Yang et al. (2012); Hortinha et al. (2011); that is, there is a positive relationship between technology orientation and product innovation. Zhou et al. (2005) also stated that technology orientation has a positive relationship with technology-based innovation but not enough influence on the category of market-based innovation. Sabai and Theresa (2018) in their research stated that digital orientation and digital capabilities directly affect digital innovation.

Alluding to how consumer habits in the digital era, a study

conducted by Santi Permata Sari (2020) has proven that consumers today have become accustomed to and enjoy online purchases very much. Goodfellow (2011) also stated that no matter how old a person is in the use of digital technology in the digital age has become a very vital need. The advent of digital device mobility became an integral part of people's lives and also increased three important factors such as speed, virtuality, and networking (Rivoltella, 2008). The digital age has been marked by the emergence of the "Digital Natives" generation. How the behaviors and habits of the digital generation of natives have been put forward by (Canbero et al., 2009) i.e. they live, breathe, work, and play with the tools and products of the digital age and they use these tools quite uniquely. The impact of technological readiness on the tendency of one's attitude to embrace and use new technologies as stated by Parasuraman (2000), will certainly be better if supported by habitual factors towards digital products as stated by Canbero et al. (2009) regarding how digital natives behave. The exposure can be used as a basis to predict that technological readiness will have a significant influence on digital value resonance if moderated by digital consumer habits. Based on the above exposure, the hypotheses proposed are as follows:

H1: Technology readiness has a significant influence on digital value resonance.

H2: Technology readiness has a significant influence on product innovation.

H3: Technology readiness has a significant influence on digital value resonance moderated by digital consumer habits.

Digital competing capabilities, digital value resonance, product innovation, and digital consumer habits

The concept of digital competing capability requires a critical understanding of three complementary and side-by-side aspects, namely technology, cognitive and social fields. This field of

technology is supported by the knowledge, skills, and attitudes needed to explore the context of new technologies and deal with technological problems in a flexible way (Ferrari, 2012). The cognitive field is supported by the knowledge, skills, and attitudes needed to read, select, interpret, evaluate data and information taken to account for accuracy and reliability (Calvani et al., 2008). The social field is supported by the knowledge, skills, and attitudes needed to interact with others collaboratively using information and communication technologies that are available together in line with the organization's existing work norms and values (Calvani, et al., 2008). So the argument can be predicted that digital competition capabilities can affect the resonance of digital value because it is closely related to the social aspect, where knowledge and skills are needed to interact with others collaboratively to use technology.

The close relationship between digital technology capabilities and product innovation has been stated by researchers before. Kristiansen et al. (2005), explained that media, including the internet, are used as a source of design and product innovation by small and medium enterprises (SMEs). Sabai and Theresa (2018) in their research also stated that digital orientation and digital capabilities directly affect digital innovation. The above statement is proposed to be the basis of the hypothesis that there is a link between digital competing capability and product innovation.

Aspects of digital capability understanding related to the social field as stated by Calvani, et al., (2008) such as how the need to interact with others using technology, can be supported by the opinion expressed by (Rivoltella, 2008) that the mobility of digital devices is inseparable from people's lives and can increase three important factors such as speed, virtuality, and network. The need to interact socially very quickly through the mobility of digital devices today has become a habit of society, especially for those so-called digital generation natives. Someone familiar with digital technology will find it difficult to interact socially quickly with

others who are not familiar with digital technology media. The argument can be predicted that the correlation of digital competition capability in digital value resonance can be improved from the moderation of digital consumer habits. Therefore, we suspect there is a relationship as follows:

H4: Digital competing capabilities have a significant influence on digital value resonance.

H5: Digital competing capabilities have a significant influence on product Innovation

H6: Digital competing capabilities have a significant influence on digital value resonance moderated by digital consumer habits.

Digital value resonance and Product innovation

The existence of technology can accelerate the development of new products, the company's ability to produce high technology and products with applied technology greatly affect the excellence of these products (Li and Calantone, 1998). Wind and Mahajan (1997,p.5) stated that technology is one of the factors that influence the success of new products, whereby by using advanced technology, companies can create products for the better or more innovative. From that opinion, a consumer, organization, or company in the digital age will tend to be difficult to produce innovative products if there is no effort to resonant with the value of digital technology in the era of industry 4.0 as it is today.

The challenges of product innovation efforts in the era of industry 4.0 have been answered by Garcia and Calantone, (2002), where the ability to produce innovative products is very strongly supported by technological developments. Sugiarti et.al, (2018) also asserted that innovation technology-based products are a prerequisite for improving product innovation. Technology is the trigger for innovation, where companies are required and triggered to innovate in echoing the values of digital products according to the needs of the industrial era 4.0. Proof of the need for digital value

is the emergence of the digital native's generation as revealed by Canbero, Johnson & Berge (2009) should be the reason for product/service providers to produce innovative products that are always oriented to digital technology. Based on the exposure, the readiness of technology that is then followed up by digital value resonance efforts will affect product innovation.

As well as technological readiness, digital technology capabilities are needed in the aspect of product innovation as described by Garcia and Calantone (2002), that to produce innovative products are very strong must be supported by the development of technology. The opinion of Kristiansen et al. (2005), is also very relevant where the media, including the internet, is used as a source of product innovation and design. The importance echoes the value of digital to provide added value to the relationship between technological capabilities and product innovation because many aspects related to technology and product innovation still have to involve the role of many parties. Based on the above relationship, the hypotheses obtained are:

H7: Digital value resonance has a significant influence on product Innovation.

H8: Technology readiness has a significant influence on product innovation through digital value resonance

H9: Digital competing capabilities have a significant influence on product innovation through digital value resonance.

19

The research model can be seen in Figure 1.

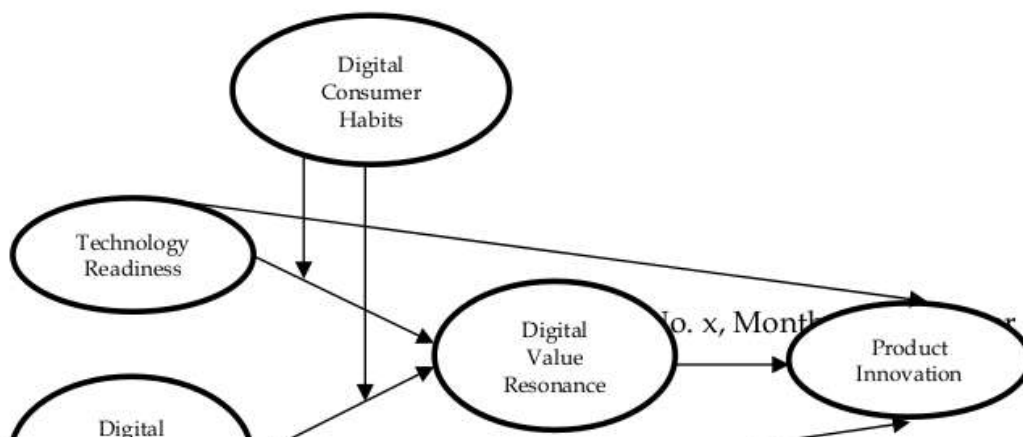


Figure 1. Research Model**Research Method****Population dan Samples**

This study aims to explain the role of technological readiness and the ability to compete digitally for innovative products through digital value resonance. The population of this study is business people engaged in e-commerce, the manufacturing sector, culinary services, or others who sell their products online, and also have some demographic information (Table 1). We use the convenience method for sampling. Respondents were given instruments in the form of closed questionnaires online and conducted interviews to measure their perception of the digital value they used to innovate their products. Questionnaires are distributed online to businesses and MSMEs located on the island of Java for a period of 2 months, namely from November to December 2020. During this period 170 respondents were selected for further statistical analysis.

Table 1. Demographic Information of the Respondents

| No. | Characteristics | Total | % | |
|-----|-----------------|---------------|-----|--------|
| 1. | Sex | Male | 64 | 37,5 % |
| | | Female | 106 | 62,5 % |
| 2. | Age | < 20 years | 27 | 16,2 % |
| | | > 20-30 years | 40 | 23,5 % |
| | | > 30-40 years | 90 | 52,9 % |

Vol. x No. x, Month - Month Year

| | | | | |
|----|--------------------------|-----------------------------------|-----|-------|
| | | > 40-50 years | 9 | 5,1 % |
| | | > 50 years | 4 | 2,2 % |
| 3. | Education | Senior High School | 24 | 13,2% |
| | | Bachelor Degree | 104 | 61 % |
| | | Master Degree | 38 | 22,1% |
| | | Doctoral Degree | 4 | 2,2% |
| 4. | The duration of business | < 3 years | 4 | 2,2% |
| | | > 3-5 years | 17 | 10,3% |
| | | > 5-10 years | 9 | 5,1% |
| | | > 10 years | 140 | 82,4% |
| 5. | Omzet /month | < Rp 10 Million | 1 | 0,7% |
| | | > Rp 10 Million - Rp 25 Million | 9 | 11 % |
| | | > Rp 25 Million - Rp 100 Million | 146 | 86 % |
| | | > Rp 100 Million - Rp 200 Million | 3 | 1,5% |
| | | > Rp 200 Million | 1 | 0,7% |
| 6. | Type of Business used | Online Business | 111 | 65,4% |
| | | Manufacture | 4 | 2,2% |
| | | Culinary | 26 | 15,4% |
| | | Others | 29 | 17 % |

Source: Primary Data processed, 2021

The number of samples obtained (170 samples) is considered more than enough for research methods using PLS-SEM (Kock & Hadaya, 2018; Hair et al., 2012).

Variable Measurement

Variable measurement items are adapted from previous research with modifications in adjusting to research objectives. All variables are measured using a five-point Likert scale, from Strongly Disagree to Strongly Agreeable. Research variables and their measurement indicators can be seen in Table 2.

Table 2. Operational Definition of Variables

| Construct | Question | Dimension/Indicator | References |
|----------------------|----------|---|---|
| Technology readiness | 4 items | - Optimisme - Innovation - Disconfort - Insecurity | (Parasuraman & Colby, 2015), (Rojas-Méndez et al., 2017), (Sani et al., 2020) |

| | | | |
|------------------------------|---------|--|---|
| Digital competing capability | 7 items | <ul style="list-style-type: none"> - Technology capability - Dynamic capability - Innovation capability - Digital economy trends - Digital business strategy - Digital strategic transformation - Digital economy information | (Benn Lawson, Danny Samson 2001), (Chi Hung Yeh et.al 2015), (Zainal Arifin, Firmansyah, 2015), (Matt C. et al 2015), (Anandhi Bharadwaj et.al 2013), (Pagani M. 2013), (Joshi, Gyanendra Prasad et.al. 2015), (Georgeta Soava, 2014) |
| Digital value resonance | 4 Items | <ul style="list-style-type: none"> - Ability to design technology based systems - Technology-based marketing configuration skills - Speed predicting opportunities for technology-based ideas - Uniqueness of sales points | (Adam et al., 2014), (O' Cass and Sok, 2013), (Sullaida et al., 2018), (Zhou et al., 2005) |
| Product innovation | 3 items | <ul style="list-style-type: none"> - Motivation for innovation development and product ideas - Product evaluation from costumers and suppliers - Adaptation to environmental change | (Zhang, M., & Merchant, H. 2020), (Jaeger et al., 2017), (Ramkumar, 2016) |
| Digital consumer habits | 6 items | <ul style="list-style-type: none"> - Dynamic - Experience - Multichannel - Artificial Intelligence - Mobilization - Product Sustainability | (Saura, 2020), (Bissell, 2020), (Met et al., 2020) |

Data Analysis

The research model was tested using the sem-pls (Partial Least Square) structural equation-technique model with smartPLS 3.0 software. SEM-PLS techniques can work effectively on small sample sizes with complex models. Also, SEM Techniques can test the effects of mediation simultaneously (Tabachnick & Fidell, 2012). Model testing on SEM-PLS is conducted in two stages, namely testing the measurement model (outer model) and structural model (inner model).

Measurement Model (Outer Model)

Measurement model testing consists of a test of the validity and reliability of the construct. The validity test consists of convergent validity and discriminant validity. The validity of convergence is used to assess the correlation between two sizes of the same concept. The loading factor value calculates the measurement of convergent validity of the reflective construct and the Average Variance Extracted (AVE) value which is the sum of squared standardized factors divided by the number of measurement items. The validity of convergence requires a loading factor value of 0.7, and the AVE value must be higher than 0.5 (Hair, et al, 2014). While the validity of the discriminant is measured by comparing the AVE value of both constructs with the square of the correlation between the two constructs tested. Discriminant validity is an assessment of how different a construct is from another. According to the Fornell-Larcker criteria (1981), the square root of each construct's AVE value must be higher than the correlation value between constructs in a model.

Reliability tests are used to determine the consistency of measurement results if measurements are performed twice or more of the same symptoms with the same measuring instrument. Reliability testing loading rules meet composite reliability criteria, and Cronbach's alpha is higher than 0.7; where 0.6 is still acceptable (Hair, et al., 2014).

Structural Model

The structural model in this study was conducted to predict causality relationships between latent variables. The parameters used for model tests are the R-Square (R^2) value and the predictive relevance model (Q2). The high R^2 value reflects a better research model, while Q2 shows the level of results of the model as well as the estimated parameters that are well assessed from the observations made. The degree of significance in hypothesis testing is indicated by the value of the path coefficient (inner model). The

loading rule of the path coefficient value indicated by the t-statistical value must be higher than 1.96 for the two-sided hypothesis in hypothesis testing using alpha 5% (Hair et al., 2012).

Results

Measurement model test results

Based on validity and reliability testing, all items meet the requirements. All items on a variable have a loading factor value above 0.7 and an AVE value higher than 0.5. Reliability tests show composite reliability values and Cronbach's alpha > 0.7 on all constructs. Thus it can be said that all variables in this study are valid and reliable. Validity and reliability test results are presented in Table 2.

Also, based on the testing of discriminant validity shows that all constructs in this research model have met the requirements. For each construct tested, the AVE square root value is higher than the correlation between constructs. This indicates that the validity of the discriminant is reached. The results of the discriminant validity test can be seen in Table 3.

Tabel 2. Pengujian Validitas dan Reliabilitas

| Variable | Indicator | STD. Loading | P-values ≤ 0.05 | Status |
|--|------------------|--------------|----------------------|--------|
| Technology readiness (X ₁) AVE = 0.889 CRI = 0.969 | X _{1.1} | 0.961 | 0.000 | Valid |
| | X _{1.2} | 0.936 | 0.000 | Valid |
| | X _{1.3} | 0.916 | 0.000 | Valid |
| | X _{1.4} | 0.959 | 0.000 | Valid |
| Digital competing capability (X ₂) AVE = 0.916 CRI = 0.982 | X _{2.1} | 0.965 | 0.000 | Valid |
| | X _{2.2} | 0.955 | 0.000 | Valid |
| | X _{2.3} | 0.954 | 0.000 | Valid |
| | X _{2.4} | 0.940 | 0.000 | Valid |
| | X _{2.5} | 0.970 | 0.000 | Valid |
| Digital value resonance (Y ₁) AVE = 0.915 CRI = 0.977 | Y _{1.1} | 0.930 | 0.000 | Valid |
| | Y _{1.2} | 0.934 | 0.000 | Valid |
| | Y _{1.3} | 0.981 | 0.000 | Valid |
| | Y _{1.4} | 0.980 | 0.000 | Valid |
| Product innovation (Y ₂) AVE = 0.939 CRI = 0.979 | Y _{2.1} | 0.957 | 0.000 | Valid |
| | Y _{2.2} | 0.984 | 0.000 | Valid |
| | Y _{2.3} | 0.965 | 0.000 | Valid |
| Digital consumer habits (Z) AVE = 0.525 CRI = 0.812 | Z _{.1} | 0.757 | 0.000 | Valid |
| | Z _{.2} | 0.575 | 0.000 | Valid |
| | Z _{.3} | 0.867 | 0.000 | Valid |
| | Z _{.4} | 0.668 | 0.000 | Valid |
| R-square (R ²) - Y ₁ | | 0,939 | | |
| R-squared (R ²) - Y ₂ | | 0,965 | | |
| Predictive relevansi (Q ²) | | 0,904 | | |

Source: data processed, 2021

Table 3. Discriminant Validity

| Variable | Tr | Dcc | Dvr | Pi | Dch |
|--|--------------|--------------|--------------|--------------|--------------|
| Technology readiness (X ₁) | 0.943 | | | | |
| Digital competing capability (X ₂) | 0.893 | 0.957 | | | |
| Digital value resonance (Y ₁) | 0.876 | 0.902 | 0.956 | | |
| Product innovation (Y ₂) | 0.855 | 0.947 | 0.913 | 0.969 | |
| Digital consumer habits (Z) | 0.129 | 0.125 | 0.106 | 0.132 | 0.717 |

Source: data processed, 2021

Structural model test results

Structural model test results showed that the Q2 digital resonance value was 90.4%. This suggests that the research model is good. Based on the results of statistical tests conducted with

bootstrap analysis, the 5 hypotheses of direct influence submitted are all confirmed. The construct directly affects digital value resonance as well as product innovation. The influence of technology readiness (1,364) has a significant negative effect on digital value resonance and (0.249) on product innovation with p-value < 0.05 respectively so that H1 and H2 are confirmed. Digital competing capability has a positive and significant direct influence on Digital value resonance (2,317) and Product innovation (1,047) and confirms H4 and H5. Furthermore, the direct influence of digital variable value resonance (0.171) on product innovation is a significant positive with a p-value < 0.10 so that H7 is not rejected.

Furthermore, the 4 hypotheses of indirect influence of both moderation and mediation are all confirmed at p-value < 0.05 and p-value < 0.10. Variable digital consumer habits (2,380) moderate positively and significantly technology readiness against digital value resonance, while moderation (2,556) of technology readiness to digital value resonance is negative and significant, and H3 and H6 are confirmed. Also, variable digital value resonance (0.233) can mediate the influence of technology readiness on product innovation and also able to mediate (0.340) the influence of digital competing capability on product innovation. Therefore, these results support H8 and H9.

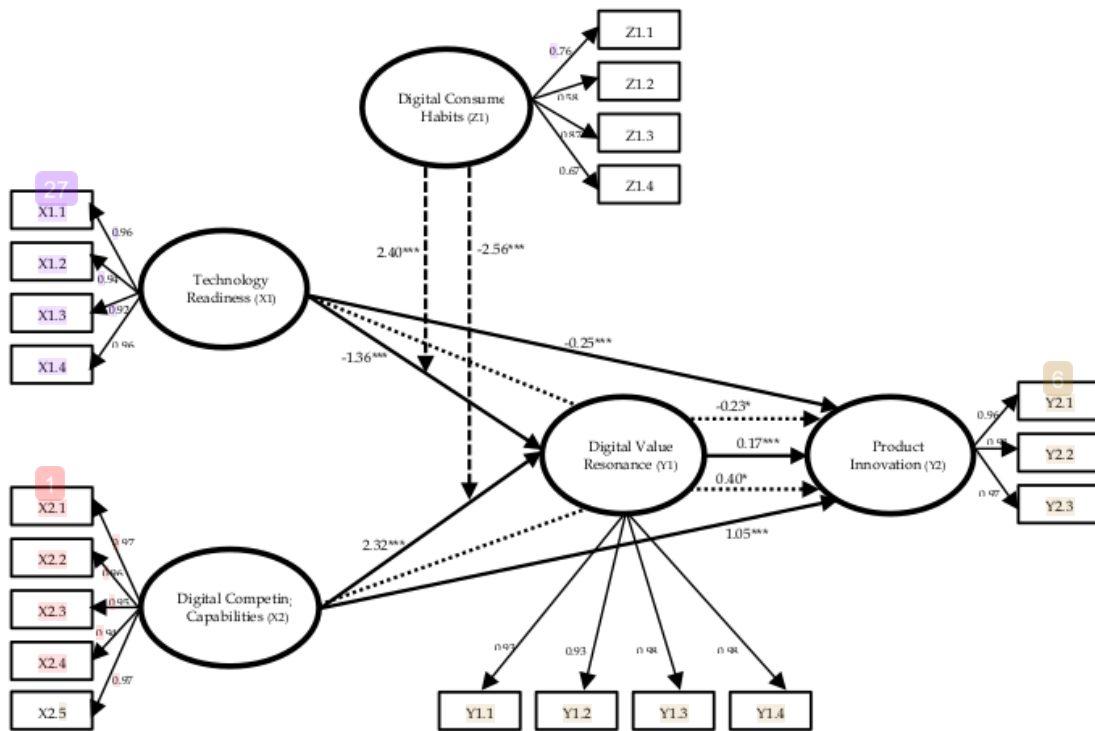


Figure 2. Full Structural Model of Digital Value Resonance and Product Innovation

Information :

- > : Direct effect
- - - - -> : Moderation effect
-> : Mediation effect
- > : Reflective indicator

Table 4. Hypothesis Testing

| Hypothesis | Direct & Indirect Effect | Estimate | T-Value | Supported/ Not supported |
|------------|--------------------------------|------------|---------|-----------------------------|
| H1 | Tr (X1) → Dvr (Y1) | -1.3639*** | 4.3346 | Supported |
| H2 | Tr (X1) → Pi (Y2) | -0.2494*** | 2.8809 | Supported |
| H3 (Mo) | Tr (X1) * Dch (Z1) → Dvr (Y1) | 2.3793*** | 4.8593 | Supported |
| H4 | Dcc (X2) → Dvr (Y1) | 2.3172*** | 8.1237 | Supported |
| H5 | Dcc (X2) → Pi (Y2) | 1.0474*** | 10.9994 | Supported |
| H6 (Mo) | Dcc (X2) * Dch (Z1) → Dvr (Y1) | -2.5558*** | 5.0148 | Supported |
| H7 | Dvr (Y1) → Pi (Y2) | 0.1705* | 1.5485 | Supported |
| H8 (Me) | Tr (X1) → Dvr (Y1) → Pi (Y2) | -0.2325* | -1.4250 | Supported |
| H9 (Me) | Dcc (X2) → Dvr (Y1) → Pi (Y2) | 0.3951* | 1.5102 | Supported |

Source : Data processed, 2021

Note : All *t*-statistics are sig. at $p < 1\%$ (***) ; 5% (**); 10% (*).

Mo = Moderation effect; Me = Mediation effect.

Tr = Technology readiness; Dcc = Digital competing capability; Dvr = Digital value resonance; Pi = Product innovation; Dch = Digital consumer habits.

Discussion

This study examines the influence of technology readiness and digital competing capability on digital value resonance, as well as its role in mediating the influence on product innovation. Besides, this study examines the role of digital consumer habits moderation towards digital value resonance, towards MSMEs in Java. The results of this study can bridge the inconsistencies of previous research, as well as provide relevant information for MSMEs businesses, especially in improving the resonance of digital value in low readiness technology and digital competing capability that is sufficient to answer the needs of MSMEs businesses to their product innovation. The results of this study are described as follows.

The results showed that technology readiness has a negative influence on digital value resonance to improve product innovation capabilities. MSME businesses with low technological readiness need to echo digital value, so that product innovation can be improved. The resonance of digital value in this study became the determining factor even though MSME businesses are not ready to adopt the technology. This study empirically reinforces the findings

of [Veronika Liljander et al. \(2006\)](#); where technology readiness contributes little to the adoption of technology. [Westjohn et al. \(2009\)](#); [Clausing and Holmes \(2010\)](#); and [Demirci and Ersoy \(2008\)](#) found where the effect on technological readiness makes it easier to adopt and use technology so that it supports decisions and improves product performance on a technology basis. The factor that encourages MSMEs businesses to increase the resonance of digital value is that MSMEs believe digital business transformation strategies can be future business opportunities. Therefore, MSME businesses can quickly capture opportunities or technology-based product ideas. Also, moderation of digital consumer habits strongly supports technology readiness even for MSMEs who do not yet have technology readiness (low readiness). Digital consumer habits have an important role for MSMEs who sell products online, making it profitable for those who adopt and use technology on products.

The results of this study also showed that technological readiness has an indirect influence in innovating products through digital value resonance. Business opportunities on digital transformation, uniqueness of products produced, accurate product design, and ease of selling products through digital technology can support the readiness of MSMEs businesses in the adoption and use of technology and motivate them to innovate products. This research empirically proves that digital value factors determine the readiness of the technology for MSMEs businesses in facing the market. Similarly, [Garcia and Calantone \(2002\)](#); [Canbero, Johnson & Berge \(2009\)](#); [Sugiarti et al. \(2018\)](#) prove the positive effects of digital value resonance such as native digital generation habits on the adoption and use of technology in producing innovative products. Therefore, the digital value or benefits of technology must continue to be echoed, which further allows MSMEs businesses to innovate on products to be marketed.

Different results in MSME businesses with digital competing capability, which has a positive and significant effect on digital

value resonance. Businesses with high digital concepts need to be supported with the knowledge, skills, and attitude to explore the context of new technologies and require interaction with others together in using technology. This must certainly be done by MSME businesses in meeting the technological, cognitive, and social aspects of the concept of digital competing capability, to resonate digital value. With digital competing capability owned by MSME businesses, giving them a coherent framework to develop and manage capabilities in a way that will build competitive advantage. Empirically this result reinforces the opinion of Ferrari (2012); Calvani et al. (2008) and Teece's findings (2013); where a close relationship can occur between the improvement of digital capability indicators and the advantages in competing from the use of digital technology. Furthermore, this significant influence gets a negative response when it is present in consumers with low digital habits. This can happen if consumers have strong control beliefs about factors that inhibit behavior in accepting and absorbing new technologies. Low perception of the development of digital technology can decrease the ability to compete digitally for MSMEs even though it has echoed digital values. These results are reinforced by the findings of Paramita et al (2018); Afriani and Halmawati (2019); which states that overconfidence towards knowledge, leads to self-restriction of technology adoption and decision-making of new things.

Digital competing capabilities owned by MSMEs businesses are also able to increase product innovation. It is proven that technology capabilities, dynamic capabilities, and innovation capabilities owned and businesses that follow digital trends and implement digital business strategies can be quickly motivated to develop product innovations and implement new product ideas. The results of this study are following the findings of Zhou and Li (2010); Bughin and Zeebroeck (2017); Sabai and Theresa (2018); where digital competing capabilities are needed to integrate digital

technology with professional digital talent. From this research, digital competing capabilities can be considered as dynamic capabilities, which are described as the ability of organizations or MSMEs to innovate new products.

The results of this study also found that digital competing capability can improve the product innovation capabilities of MSMEs businesses by resonating digital values. However, the result of this indirect influence obtained a lower value (0.395) compared to the direct effect (1,047) indicating the partial mediation effect of digital value resonance to fill the gap between digital competing capability and innovation product. Thus, this finding makes it clear that in addition to the capabilities can improve product innovation capabilities, by echoing the value of digital can mediate MSMEs businesses to innovate products. Most of the respondents in this study were online businesses with a turnover between Rp. 25 million to Rp. 100 million with the potential to adopt technology, resonance digital value, and can compete digitally on improving product innovation.

Implication

Dissemination and literacy of digital product technology create competitiveness, both local, national and foreign MSMEs. Indonesia's growing population makes it a potential market share for MSMEs in offering contemporary innovations through the benefits of technology. Almost nowadays all promotional media is done through technology media. It is very important to know the driving factors of technological readiness so that the potential market share is increasingly competing to offer different products to be manufacturers that contribute to consumers.

The explanation of this study describes that respondents as potential businesses know about digital technology, but from demographic character, subject, and objectivity not all are able and even able to respond. This shows that MSME businesses are not fully able to operate all the latest technological features that exist in

the market today. Readiness is an important factor during the boom of advanced technology that is increasingly updated. Digital consumer behavior has a positive implication on the demands of ease and speed of access to demand MSMEs to synergize to have competitiveness in product innovation changes.

Conclusion

In conclusion, this study concentrates on investigating the factors that drive the readiness of competitive technology to improve innovative products in MSMEs. From the results of statistical tests obtained that the impact of technological readiness and digital competitive capabilities have a significant positive effect to make changes to the improvement of innovation. Critical factors in this research seek to echo the value of digital at the level of technological readiness and certainly have competitiveness competencies. These results show that the main determining factor in echoing the value that exists in digital technology is so important in the face of the dynamics of innovation diffusion and practical oriented to the needs of consumer services. The higher the level of technological readiness felt the higher the value of digital resonance to be disseminated. On the contrary, the lower the readiness of technology will affect decreasing product innovation, so the resonance of digital value can bridge the digital values of the relationship of readiness and digital competitive capabilities. This study successfully revealed that digital consumer habits can strengthen the response of technological readiness and competitive capabilities in absorbing digital values in product innovation. Digital technology service providers can take advantage of the findings of this study. Therefore, optimization of digital value resonance which in turn will have an impact on improving the maneuverability of the latest product innovations. Thus, the presence of digital value resonance can echo the value of digital technology for MSMEs and digital consumers.

Current research has some limitations. First, the sample size

Vol. x No. x, Month - Month Year

is relatively small which is less than 200 respondents, and respondents are still focused on Java island. Second, the characteristics of respondents are still dominated by tech-savvy millennials, so understanding the use of technology features is better than parents'. About these limitations, generalizing the findings of the study requires broader dissemination. The study recommends that future researchers should investigate the role of augmented reality technology in empowering local brands in dealing with foreign brands and explore the effects of moderators. It was found that most respondents knew about technology but we're not all yet able to create a competitive technology medium to meet their business. Furthermore, this study suggests future studies to include variable information technology dexterity influenced by market sensing capabilities and brand management capabilities in improving the productivity of Msme's business performance.

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