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ORGANIZATIONAL CULTURE AND TECHNOLOGICAL CHANGE IMPACT ON ORGANIZATIONAL INNOVATIVENESS WITH A MODERATING EFFECT OF AGE DIVERSITY

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Abstract. Organizational culture is a determinant of the innovation in the organization. This paper aims to investigate the effects of organizational culture (OC) and technological change on organizational innovativeness and examine the moderating effect of age diversity towards the relationship to test some categories of ages could perform diversity in generating organizational innovativeness (OI)**.** The samples were collected from private university that has age diversity within the organization. A total of 92 respondents participated in this study. Study found that organizational culture and technological change has positive impact on organizational innovativeness. Age diversity performs pure moderation and give significant impacts towards the model.

Keywords*: organizational innovativeness, organizational culture, technological change, age diversity*

Introduction

Innovation is an important source and a key determinant in organizational growth. Innovation is triggered at the same time supported by technological changes that also create changes in people's lifestyles. An organization can grow more innovatively if it has the capabilities to understand internal and external environment (Menguc, Auh, & Ozanne, 2010). Perceiving external side of the organization, technological change has been disruptive and has a great role to drive changes in the organization. Technological turbulence drives all organization to adapt.

Looking into the internal side of organization, the culture that grows within becomes interesting to be analyzed. Other than organizational culture, there is a capability of the organization to learn and absorb the knowledge from the external side of the organization as innovation depends on knowledge that is absorbed and stored in organization (Gunsel, Siachou, & Acar, 2011).
There is a phenomenon related with how the innovation is generated in the organization that has been existing for a long time which tends to have a varied age category within. *Top management team*'s ages in this criterion of organization differs far from other group of employees. The differences in ages have significant role in creating the innovative organization. Organization member with ~~in~~ a relative younger age category tends to perform innovatively and embrace changes easily (Kapoor & Solomon, 2011).

Organization culture has been linked with the innovativeness within an organization and is considered to be one of the key elements in both enhancing and inhibiting innovation (Naranjo-valencia & Sanz-valle, 2011; Riivari, Lämsä, Kujala, & Heiskanen, 2013). Organization cultures is also said as knowledge repository and becomes a determinant to innovate the organization and the products and/or services produced. Organizational culture is a clear determinant of innovation strategy (Naranjo-valencia & Sanz-valle, 2011).

The organizational culture measure captures the four elements i.e. clan, adhocracy, hierarchy, market. This measure is popular used in organizational culture studies and has a well-developed theoretical basis since a long time ago (Deshpandé, Farley, & Webster, 1993; Hurley & Hult, 1998; Quinn & Cameron, 1983; Quinn & Rohrbaugh, 1983). Under these portions,

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organizational culture was measured in terms of the involvement of, consistency, and mission. This is obtained from Denison Organizational Culture model that has been developed in twenty years, involved more than 3000 organizations tested and more than 100,000 people surveyed (Denison, 1990; Denison & Mishra, 1995; Denison & Neale, 1999).

While organization keeps evolving so does the technology that drives it. Information technology is reconstructing how the business model is executed and values are created in traditional industries which is used to be offline operation, accelerating their extension to online and forcing traditional organizations to make necessary changes for strategic sustainability and growth. Technological changes or technological turbulence is defined as fast change of technology in the industry in which an enterprise operates, where most of the new product development ideas are perceived through technological developments. Technological turbulence offers important opportunities for the industry and innovative decision they take for company strategies (Celtekligil & Adiguzel, 2019) leading to constant learning and serial innovation (Golgeci & Ponomarov, 2013).

The emerging technology nevertheless is linked with the young generation as the most common user and also a creator. Younger generation in the workplace is categorized as in the Millennium Generation which is the demographic group that has recently been in higher education and is now entering the workplace. As belonging to the "ingroup" or a group consisting of individuals of the same age or generation provides a social identity (Richard & Shelor, 2002), we use this category to define age diversity.

Millennials are characterized as having high levels of self-confidence and self-reliance; they are independent, individualistic, and socially active and like to work in teams (Shih & Allen, 2007). In dealing with technology in work-life setting, millennials technological professionalism linked with effective curriculum that address their attraction to technology, general interconnectedness, propensity toward multitasking, new vision of a work-life blend and entrepreneurial spirit (Otey, 2013). These differences in social categorization are undeniably faced by organization. Age is an important variable and a visible characteristic that can be used for social categorization (Schneid et al., 2016). They are characterized by digitally connected, having ability to utilize multiple technologies simultaneously, seeking for work-life balance and considered as more confident and entrepreneurial (Otey, 2013).
With age as a moderating variable we intend to see whether this variable would strengthen or weaken the relationship between organizational culture and technological change towards organizational innovativeness. Age diversity has been linked with output and performance of the organization as well as its innovation (Kunze, Boehm, & Bruch, 2013; Roth & Kanfer, 2014; Schneid et al., 2016).

Innovation is an inherent part of organizational culture (OC) (Abdi & Senin, 2014). Organizational innovation is recognized as a source of competitive advantage and, by extension, as a source of success for the business (Barney, 1986; Kaplinsky, R. and Santos, 2005). Innovativeness in the context of organizational innovativeness is measured by three dimensions such as organization's willingness to innovate, organization's ability to innovate and organization's possibility to innovate (Kessler, Pachucki, Stummer, Mair, & Binder, 2015). Organization that wants to be innovative must transform their negative characteristics of organizational culture to be supporting all characteristics of innovating firms such as open minded thinking, open and rule-free environment (Audretsch, Lehmann, & Warning, 2013). Innovation indicates the generation, acceptance, and implementation of new ideas, processes, products and/or services (Abdi & Senin, 2014).

Organizational innovation is defined as the application of ideas that are new to the firm that is incorporated in products, processes and management or marketing systems (Weerawardena,

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O'Cass, & Julian, 2006). Innovation has become complex and keeps disrupting the industries due to changing consumer needs, extensive pressure and rapid technological change (Calantone, Cavusgil, & Zhao, 2002). It is important to seek the impact of organizational culture and technological change towards organizational innovativeness with the moderating effect of age diversity in the workplace.
Organizational innovativeness is expected to be generated from organizational culture and technological change as well as incorporating age diversity from millennial generation category.

In order to examine the relationships, we propose the hypotheses of this study as follows:
H1: Organizational Culture positively impacts Organizational Innovativeness
H2: Technological Change positively impacts Organizational Innovativeness
H3: As the value of Age Diversity increases, the relationship between Organizational Culture towards Organizational Innovativeness also increases
H4: As the value of Age Diversity increases, the relationship between Technological Change towards Organizational Innovativeness also increases

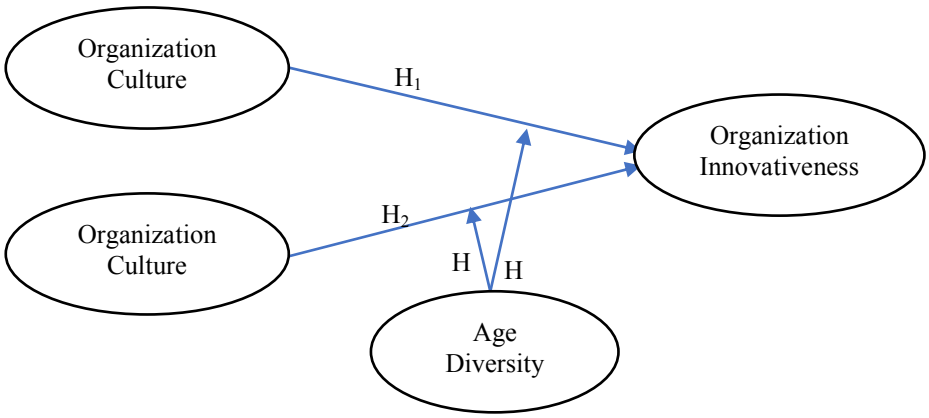

Figure 1 Theoretical Framework

Method
The objective of this study is to seek the impacts and how the organizational innovativeness is generated from organizational culture and technological change linked with age diversity. In this study, the population are 104 full time employees of one of private universities in Jakarta, Indonesia. SEM analysis was used to provide a characteristics and overview of the collinearity in this study using LISREL 8.8 statistical software.

The data was collected through a survey on the member of organization using a previously tested questionnaire. A five-point Likert scales ranging from 1 "strongly disagree" to 4 "strongly agree", was used without a neutral option. Using online questionnaires targeting a total 104 respondents in total, 92 valid responses were obtained, yielding a response rate of 88 per cent. This sample size is valid, as the sample size should be ten times or more as the variables observed in research (Sekaran & Bougie, 2016). This study has four variables and based on the response rate, it is considered good for analysis. No response bias has shown as there is no significant differences were found.

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Table 1. Measurement

Construct	Measurement
Organizational Culture (Gochhayat & Suar, 2017),	1. Involvement: Empowerment, Team Orientation, Capability Development 2. Consistency: Core values, Agreement, Coordination & Integration 3. Adaptability: Creating change, Customer focus, Organizational learning 4. Mission: Strategic direction & intent, Goals & Objectives, Vision
Technological Change (Godin, 2015)	1. New process 2. New tools 3. New facilities 4. New product/services
Age Diversity (Otey, 2013)	1. Team Oriented And Digitally Connected 2. Multi-task, Utilizing Multiple Technologies Simultaneously 3. Seek An Integrated Work-Life Blend Afforded By Technology 4. More Confident And Entrepreneurial Than Generations before them
Organizational Innovativeness (Kessler et al., 2015)	1. Willingness to innovate 2. Ability to innovate 3. Possibility to innovate

Discussion and Result

Demographics results shows that 41.5% respondents are categorized below 40 years of age while 46.8% of the respondents are 41-60 years of age. 11.7% respondents fall under the category of above 61 years of age. This mixture of age categories examines the moderating effect of millennials age characteristics as age diversity. From education level result we get 33.3% of respondents hold bachelor's degree. 43.3% of respondents hold master's degree while 21.5% of them fall under the category of doctorate education level.

Based on the results shown on the below figure, we obtained the data that the loading factors in all measurements of organizational culture are considered good because each loading factor per item is >0.5. Involvement dimension has CR value = 0.756; Consistency has a value of CR = 0.747; Adaptability has a value of CR = 0.743; Mission has a value of CR = 0.741; and OC in general has a value of CR = 0.822. Hence, the testing of Construct Reliability (CR) values on organizational culture (OC) variables are considered good.

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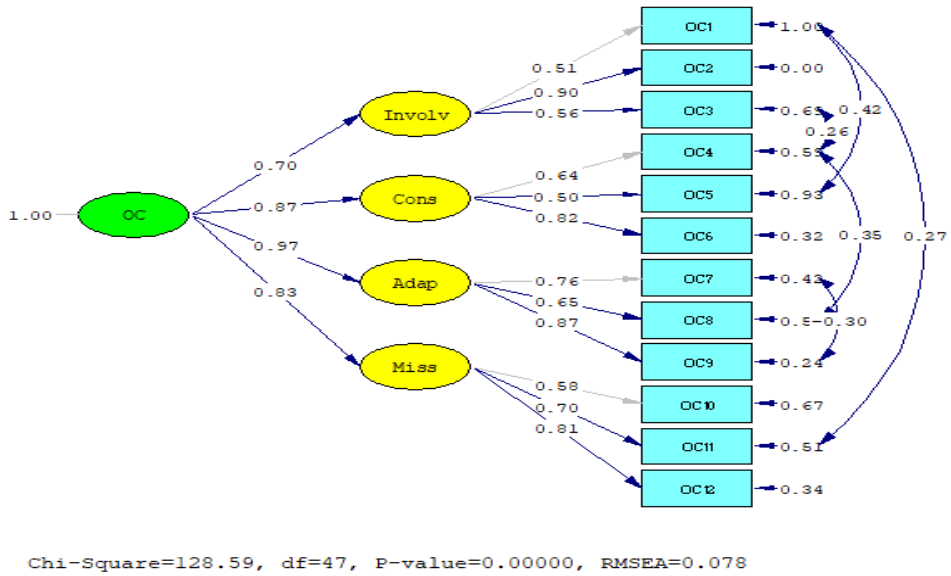
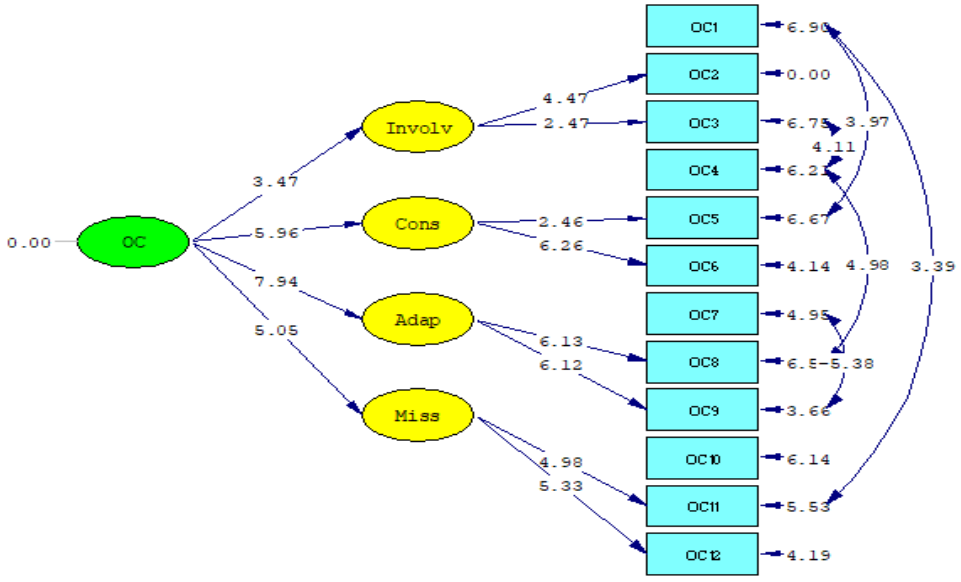


Chi-Square=128.59, df=47, P-value=0.00000, RMSEA=0.078

Figure 2 Standardized



Chi-Square=128.59, df=47, P-value=0.00000, RMSEA=0.078

Figure 3. T Values

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Next output shown of the CFA testing is the model fit testing of indicators of organizational culture (OC). On the output can be seen from Goodness-of-Fit Index. Based on the measure of model fit indicators we used, the model has fit and met the criteria as the result of 11 indicators showing that 10 indicators are good fit. The results are as follows:

Table 2 Goodness of Fit

GoF	Target	Results
Normal Theory Weighted Least Squares Chi-Square = 128.59 (P = 0.000)	P Value > 0.05	No Fit
RMSEA = 0.078	< 0.05 or 0.05 ≤ RMSEA < 0.08	Medium Fit
NFI = 0.90	≥ 0.90	Good Fit
NNFI = 0.90	≥ 0.90	Good Fit
CFI = 0.91	≥ 0.90	Good Fit
IFI = 0.91	≥ 0.90	Good Fit
RFI = 0.91	≥ 0.90	Good Fit
RMR = 0.075	≤ 0.10	Good Fit
Standardized RMR = 0.012	≤ 0.10	Good Fit
GFI = 0.91	≥ 0.90	Good Fit
AGFI = 0.90	≥ 0.90	Good Fit

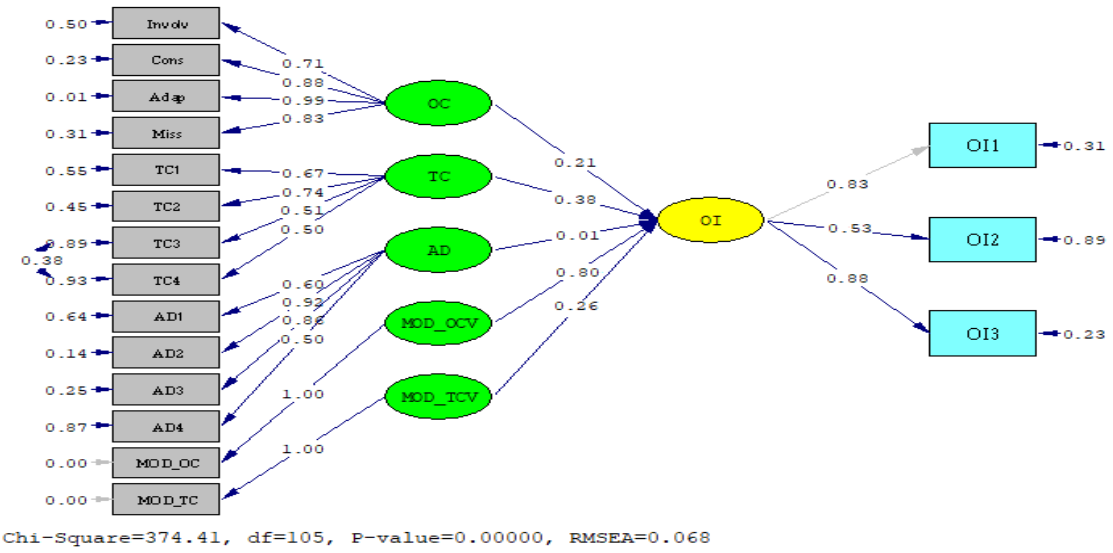

Figure 4 Standardized

Based on standardized result above, we obtain the data showing the values of factor load value of all items in the figure already have a relatively good value because the factor load value per item already has a value> 0.5. As seen on the value of Construct Reliability (CR) obtained for each variable is also quite good, namely OC has a value of CR = 0.788; for TC it has CR = 0.723; for AD it has CR = 0.722 and for OI it has CR = 0.779.

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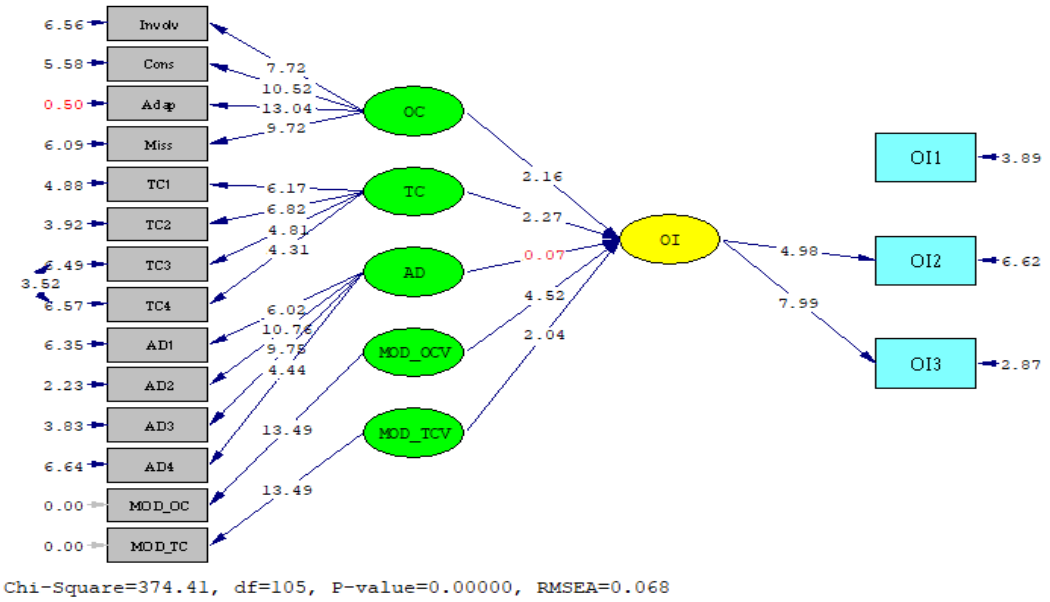

Figure 5. T Values

Based on the output of t-values we can conclude that the results showing the interaction of moderator is good and significant towards the OC and TC. This means that AD can moderate OC and TC towards OI is considered as Pure Moderation.

Table 3. Structural Model Result

Path Testing	Hypothesis	T-Values	Results
OC -→ OI	H1	2.16 > 1.96	Positive and significant
TC -→ OI	H2	2.27 > 1.96	Positive and significant
AD-→ OI	-	0.07 < 1.96	No significance
MOD_OCV (Moderation interaction: AD X OC) -→ OI	H3	4.52 > 1.96	Positive and significant
MOD_TCV (Moderation interaction: AD X OC) -→ OI	H4	2.04 > 1.96	Positive and significant

The relationship between organizational culture and organizational innovativeness is 2.16, meaning that there is a significant relationship between organizational culture and organizational innovativeness. Hence, the *hypothesis 1* is supported. Technological change has a positive and significant effect on organizational innovativeness as t-value is 2.27, greater than 1.96. Hence, *hypothesis 2* is also supported. The moderation of age diversity has good interaction and positively affects the relationship between organizational culture and organizational innovativeness and so does towards the relationship between technological change and organizational innovativeness as shown on Table 3. Hence, hypothesis 3 and 4 are supported.

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Next results are the testing CFA on model fit tests. The output can be seen on Goodness-of-Fit table. Based on indicators of model fit, the model in this study is fit as 10 out 11 indicators have met the criteria. The results are as follows:

Table 4. Goodness-of-Fit

GoF	Target	Results
Normal Theory Weighted Least Squares Chi-Square = 374.41 (P = 0.000)	P Value > 0.05	No Fit
RMSEA = 0.068	< 0.05 atau 0.05 ≤ RMSEA < 0.08	Medium Fit
NFI = 0.95	≥ 0.90	Good Fit
NNFI = 0.92	≥ 0.90	Good Fit
CFI = 0.90	≥ 0.90	Good Fit
IFI = 0.91	≥ 0.90	Good Fit
RFI = 0.95	≥ 0.90	Good Fit
RMR = 0.011	≤ 0.10	Good Fit
Standardized RMR = 0.017	≤ 0.10	Good Fit
GFI = 0.97	≥ 0.90	Good Fit
AGFI = 0.92	≥ 0.90	Good Fit

Implication

We contribute to the literature by providing empirical study on different unit analysis and industry particularly academic institutional examined in this research. Our work may be giving clearer understanding for human capital division, managers and the first echelon employees in organization to study the perk of having combined generations working in their organization. Further to consider a good program to develop and enhance the skills to keep up with technological changes.

Conclusion

Organizational culture is proven as the determinant of organizational innovativeness. This study found that organizational culture and technological change have positive impact on organizational innovativeness and age diversity performs a significant impact towards the model. Millennials characteristics have been proven that they impact the relationships of both organizational culture and technological change towards the innovativeness. This supported the arguments that mixture of age group could give good impact in the organization. Future research is expected to be done in different industry and hopefully can incorporate two distinguished characteristics of different age groups in the organization and to be done in two different sections analysis. Future research can also focuses on the effect of firm performance include financial performance after the company innovates its business process and/or business model. There are still very limited previous researches that redefine the variable age diversity as distinct categorization of millennials generation as moderator towards the relationship of organizational culture and organizational innovativeness, so does on the relationship of technological change with organizational innovativeness.

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