Inclusion of Information and Communication Technology to MSMEs Strategic Planning in Indonesia

Tutik Inayati, Ignatius Edward Riantono, Tjia Fie Tjoe

Abstract: *Micro, Small and Medium Enterprises (MSMEs) have become one sector in Indonesia that are important for economic development. However, the system for MSMEs are unknown and unconstructed, especially with the development of information and communication technology that affect the sustainability and productivity of MSMEs. Therefore, this study's first objective is to build a model that contains MSMEs model in macroscopic view with the involvement of ICT to enhance income for MSMEs. Second objective is to determine what recommendations should be given to raise the economic development received from MSMEs involvement according to the model. The results are a causal loop model is built based on previous researches about MSMEs that combine factors and important elements in the system. Based on the diagram, there are three recommendations given to the Government: trainings to MSMEs about ICT for their businesses, continuing to apply tax reduction for MSMEs, and enhancing their market shares by internalization process.*

Index Terms: *ICT, MSMEs, Strategic policies, System Dynamics.*

I. INTRODUCTION

Small, and Medium Enterprises (SMEs) become entities that can support economic development of a country [1], [2], [3]. Even though there are different definitions and criteria on which enterprise categorised small or medium, the concept of small and medium can be grasped easily by communities. For example, according to OECD [4], SMEs' employees are 250 at maximum; but 200 is set as the limit in European Union. Meanwhile, especially for developing countries, Micro, Small, and Medium Enterprises (MSMEs) are more common to be used since micro businesses rising from time to time. Micro enterprise has 10 of maximum employees in their enterprises [4]. Even in European Union, SMEs comprise of 99 per cent of total units of business there [5].

Tutik Inayati*, Entrepreneurship Department, BINUS Bandung School of Creative Technology, Bandung, Indonesia.
Ignatius Edward Riantono, Economics and Communication Department, BINUS University, Jakarta, Indonesia.
Tjia Fie Tjoe, Entrepreneurship Department, BINUS Bandung School of Creative Technology, Bandung, Indonesia.

Micro, Small, and Medium Enterprises (MSMEs) had begun to rise in Indonesia's economy map. From 2017 data [6], there are more than 62 million enterprises, in which Micro Enterprise had the largest proportion of all -- more than 97 per cent of all MSMEs units in Indonesia. Meanwhile, 2017 shows increasing in units by 1 million MSMEs enterprises in Indonesia. This shows that the number has always been significantly increasing compared to previous years. Meanwhile, the last compiled data was in 2013, where the number of business units were more than 57 million categorised in MSMEs. The rise of MSMEs in Indonesia, as a developing country, can be a good indication the economy is rigid and independent. The amount of MSMEs in Indonesia can stabilise the economic condition especially when global economy crisis occurs.

Since the existence of MSMEs generate significant positive influence, the sustainability of MSMEs needs to be preserved, mainly by the government. Factors influencing the sustainability of MSMEs vary, depends on how a person or an institution see it and the system is complex. For example, MSMEs cannot survive without consumers and how they market their product or service, and what value can they offer to their customers. The financing of MSMEs and Government's policy support to ease the business process of MSMEs are also important for their sustainability. Above are some factors that will influence MSMEs existence and sustainability.

Since the system is very complex and it includes many stakeholders and point of view, looking one way of how MSMEs were influenced and influencing what kinds of variables, it is very interesting to build a model that can map the complexity and comprehensive the macro viewpoint of the system to see how it influence a country's performance in economy contributed by the performance by MSMEs. Moreover, with digitalisation era like nowadays, Information and Communication Technology (ICT) helped the way people live, including how people are doing business and even socialising. Since ICT has now become the major part of people's lives, business attempts to utilise to his or her own benefit. Therefore, this study's objectives are, first, to build a model that could reflect the system of MSMEs in Indonesia with the inclusion of ICT for MSMEs' scopes and, second, generate Government's policy that would significantly support economic development in Indonesia. The scope of this study is that we used literatures from previous research in other countries to build a general model but is reasonable enough to be applied in Indonesia.

II. LITERATURE STUDIES

As mentioned in the introduction, SMEs or MSMEs had been proven as the promoters of economic growth in so many countries. One factor that support this statement is because the sharing process of information among SMEs business that form clusters of information and business [7].

The connections of these clusters may be enhanced by the support from adoption of Information and Communication Technology (ICT) [7]. Similar recommendation of building clusters or unions among SMEs was also suggested by [8] who concluded that small firms should unite and help each other when difficulties in their businesses occurred. In the meantime, ICT development also needs research and development (R&D) to produce innovation in order to make MSMEs productive. When some people argued that small firms, or MSMEs, do not need to divide certain proportion for R&D [9], [10] reported that links between R&D, innovation, and productivity in small firms were similar to larger enterprises. The types of ICT used in SMEs according to [11] are internet usage, e-banking services, and short message services (SMS). Meanwhile [12] concluded, ICT elements that should be used in MSMEs were ownership and utilization of computers and ownership and utilizations of internet. Based on these references, the common foundation of ICT usage is always related to internet services.

Financing options have large roles in the sustainability of MSMEs. One case in Ghana by [13] confirmed that Government also had major roles to policies when it came to financing MSMEs whilst paying attention to financial institutions and instruments. The similar problem to financing MSMEs in Ghana to other countries is that banks seldom gives SMEs enough attention for their development. All in all, Mensah stated that with the various sources of financing, SMEs could be significantly improved in creating and developing. Another problem of financing MSMEs is the unavailability or trust to MSMEs by the creditors. [14] confirmed the trust issue that young and small firms, particularly in nonmanufacturing sector, faced the difficulties in raising funds more than well established and larger firms. More credit information available to debtors could decrease financial constraints and would very much help SMEs to receive financing from banks. Dong & Men also confirmed that good institutional environment would improve access of SME to financing options for their business, significantly. Similar to [14] result, another research conducted in Australian SMEs about whether the types of industries influenced different type of debt and financing; and type of industries indeed influenced short-term debt, long-term debt, and total debt compared to total funding [15]. Poor and unconstructed business plan and projects planning are also reasons about why the SMEs are having difficulties to reach financing agreement with creditors [16].

Government's inclusion for distributing SME policies also cannot be denied [8]. Policies implemented by the country's government are also expected to influence the productivity and the sustainability of MSMEs. Nonetheless, in one case in Latin America and the Caribbean, despite of support of Government and external parties' support for the growth of SME there by applying trainings for SMEs to improve their productivities, there was no clear indication that those programs indeed accomplish what have been targeted. Therefore, it is essential to understand which policies that could benefited SMEs by having more follow ups to programs invented for SMEs [1].

Indonesia categorized MSMEs based on the net profit and sales. According to Bill by House of Representatives in 2008, Micro enterprises are companies that have at most IDR 50 million for net asset or have IDR 300 million at most for revenue. Meanwhile, Small enterprises are companies that have IDR 50 - 500 million at most for net asset or have IDR 300 million – 2.5 billion for sales per year. Lastly Medium enterprises have IDR 500 million – 10 billion for net asset or IDR 2.5 billion – 50 billion for sales per year. If a company's have larger amount for net asset or sales per year, then it can be categorized as large enterprise.

A research about SMEs' condition in China and India as a comparative study by [3] pointed out differences between China and India. First, difference in economic development where China's Gross Domestic Product (GDP) growth rate was more than 8 percent and India's growth rate was 5.5 percent despite of similar support from Chinese and Indian's government. According to their research, one cause was the different R&D expenses in both countries: India provided less than China for R&D expenditures. China's main problem was the inefficiencies of State-Owned Enterprises, pollution, corruption, and income inequality in areas in China. Meanwhile, India's major problem was the low scale production in its SMEs compared to China that produces in large scale.

Establishing MSMEs are very encouraged, especially by Indonesian government. One way to support this encouragement is by reducing taxes for MSMEs. For example, according to Indonesia's tax office's website [17], the tax for MSMEs had been cut down from 1 per cent to 0.5 per cent. Even though this tax cut is optional, due to several terms and condition to follow up this policy, the support is clear for Indonesian government to increase the number of MSMEs and encourage Indonesian citizens to become entrepreneurs. Meanwhile, compared to several other countries in Southeast Asia, Indonesia's total MSME age of establishment is 15 years, which is considered as mature age especially for SMEs [18].

According to [18], there were three essential paths to boost the productivity of MSMEs in Indonesia. First, was to legitimize small businesses in Indonesia. This path can protect legal employment status for future disadvantageous occurrences. Second path was to increase investment, especially to MSMEs owners. Increasing investment is usually conducted by the external investors such as venture capital or other types of investors available. The third path was to improve human resources' quality. This type of support should not only be valuable to MSMEs' productivity, but also to the quality of human resources in Indonesia in general.

III. METHODOLOGY

This study utilizes System Dynamics as one methodology to answer its objectives. System Dynamics was first built by Forrester in 1969 [19] to build a model that can interpret or comprehend complex systems and complex circumstances. The advantage of using System Dynamics is that we can analyze a complex system in a less complex way to achieve complete understanding the system, with limitation and scope of discussion. Second advantage for using System Dynamics is data can be not only in quantitative form but also in qualitative form, since some variables that we consider in the model might not in quantitative form, System Dynamics can ease qualitative form by using dummies (quantifying qualitative data).

System Dynamics had been utilized by several researches in relation to SMEs and MSMEs researches. [20] had conducted a research in SMEs using system dynamics approach, particularly in strategies for e-commerce enterprises. According to their survey, there were several concerns for SMEs to approach e-commerce strategies. To name a few, those were a lack of resource, information systems, quality, customer service, and advertising. Another

research by Schmidt and Gary [21] also used system dynamics to comprehend the decision-making strategies in high technology SMEs; not only System Dynamics, they also used conjoint analysis as a complementary method to System Dynamics in their research. The obstacle for conducting their research was the lack of available data, which is the obstacle to conduct this study too.

- The micro, small, and medium business stocks.
- Market aspects.
- Financing aspects.
- Government or macroscopic aspects.

Each aspect represents the scope of this study; the reason behind it is that those aspects are most common associations to MSMEs. Creating this model is the fundamental outcome. Hence, we connect these four aspects and create a causal loop diagram that could represent the MSMEs system in general with adjustment to Indonesian context. In this study, data will not be inserted; simulation will be conducted for further research.
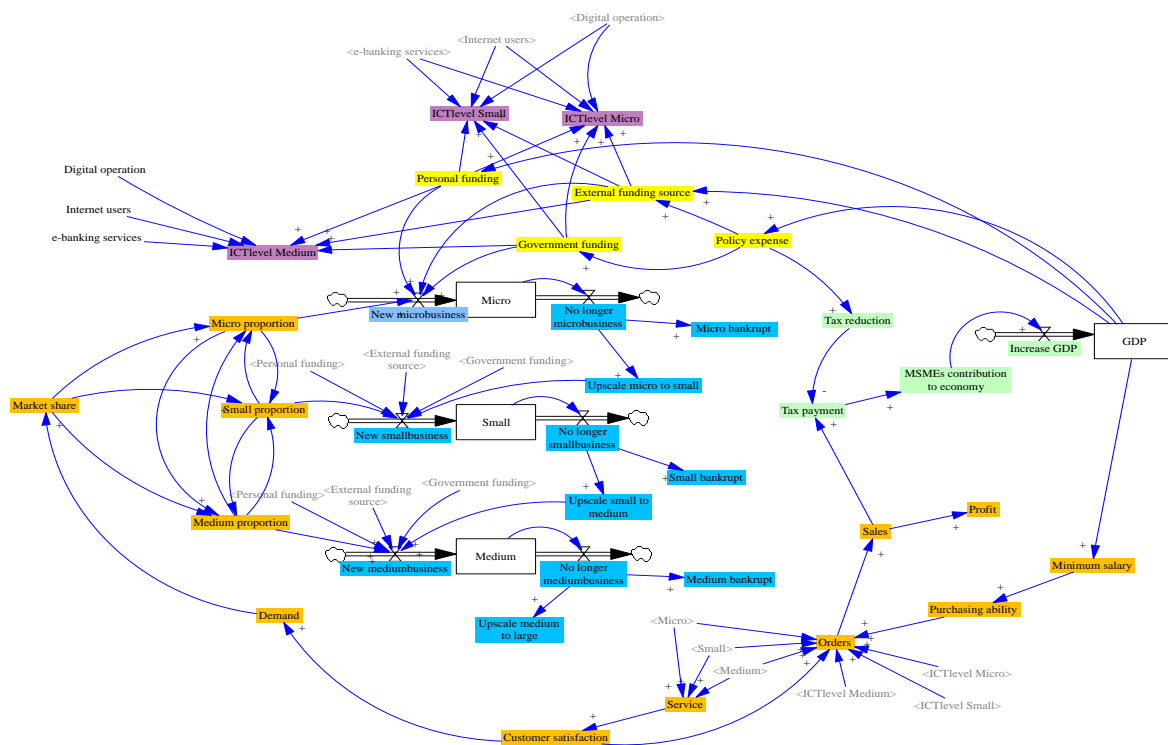
IV. MODEL AND DISCUSSION

Figure 1. Causal Loop Diagram (Source: author)

In figure 1, each aspect is represented by colour. Orange represents market aspect; blue indicates micro, small, and medium business; Government (macroscopic) aspect's variables are represented in green colour; ICT variables are indicated by purple colour; and yellow indicates financing aspect.

There are 25 loops in this model, which means when simulation will be conducted, the result should not be linear since there are a lot of causal relationships. Hence, we could conclude that the model is complex. Since there are 25 loops,

it is very long process to describe each loop. Therefore, in this discussion, we would discuss the model per aspect.

First is the market aspect. Variables included in the model are: customer satisfaction, service, purchasing ability, sales, profit, minimum salary, demand, market share (MSMEs' market shares), micro proportion (market share for micro size business), small proportion (market share for small size business), and medium proportion (market share for medium size business).

These variables are considered essential to the sustainability and closely related to MSMEs market, which is less complex than large enterprises. Market share is influenced by demand, while customer satisfaction affects demand in the market in MSMEs context versus large enterprises; this is concluded when customers would be satisfied by their service (service influences customer satisfaction), demand will be positively affected by good reviews from customers. Positive effect by customer being satisfied can also increase orders, new or second timer customers. Minimum salary influences purchasing ability for society in general, which eventually, would influence the number of purchasing as well.

Meanwhile, in business stocks there are only essential variables constructed in the model. Those variables are: New number of micro businesses, new number of small businesses, new number of medium businesses, The number of micro, small, and medium companies, the number of companies that do not belong to the three groups anymore due to bankruptcy or up scaling to larger type of businesses. This aspect mainly comprises of stocks and flow diagram, which is the one of the highlights of the model. Another emphasis in the model is that businesses are not forever existing; therefore, there is outflow of the stock, both possibilities are defined: whether a business develops into a larger type of enterprise or go bankrupt. Since no real data had been collected yet, the proportion needs to be adjusted with each condition of a country [22] and industry firms are in [23]. Government aspect's variables included are tax payment, tax reduction, MSMEs contribution to economy, and increase GDP. Government has the capacity to create policies that could benefit MSMEs. The main highlight in this aspect is how GDP can be affected by incoming tax from MSMEs and at the same time attempts to support MSMEs by reducing tax burden for MSMEs.

As for financing aspect, the model included three major financing sources for MSMEs. MSMEs, especially micro and small, were usually funded personally by the owners. However, it does not limit the source from Government or external parties. Government's funding in Indonesia is held annually for business funding and the nominal is rather small; in Europe, Government has rather large roles for the financial development of SMEs [24]. External funding could come from many sources, such as: crowd funding, peer to peer (P2P) lending [25], business angels [26], venture capital [27], and other types of external funding sources.

ICT aspect in this model is the technology related to the platform of communication between MSMEs and consumers. Therefore, ICT is set to influence the number of orders with the assumption of the higher ICT capability that an enterprise has the more orders that it could receive. Meanwhile, ICT in an enterprise needs enough investment, whether from internal (personal) or external parties, hence in this model position ICT capability from every type of enterprise is affected by how much funding available to improve ICT area in their company. However, any facilities concerning information technology need long-term commitment from the firms [28]. That is why when doing simulation, there should be time delay in the ICT level in every enterprise. ICT level is also determined by how many enterprises have three main components: Digital operation, Internet users, and e-banking

services [11] & [12]. These three main components would increase the rate and increase the service level of an enterprise. This process leads to increase of orders and sales, and eventually increase the income for the Government.

V. CONCLUSIONS

MSMEs in Indonesia as developing country are on their way to larger development; the existence of MSMEs has significant effect to economic development in a country and welfare to its people. Increasing number of MSMEs in Indonesia also pushes the Government to create new policies that could generate win-win solution for all stakeholders involved in the system. And yet, the system for MSMEs has not been built previously, while building a holistic system is very important to understand the significant factors and implementing certain policies as intended. Not only that, Information and Communication Technology (ICT) nowadays has been a major game changer in the market world, including the sales productivity of MSMEs from consumers. Thus, this study's first objective is to build a model that reflects MSMEs system in Indonesia with the inclusion of ICT for MSMEs. By creating a model, we could comprehend the system more holistically so we are able to recommend what tentative Government's policies that could significantly influence larger economic development and increase the number of MSMEs. The main result and novelty of this manuscript is the model itself. Since it has not been previously creates, this model may be utilized as a platform for further expansion of the model. There are 25 loops, meaning that the model itself is complex and is interesting to be discussed. Therefore, this manuscript discusses the elements or variables included in the model.

There are several important aspects: market aspect; micro, small, and medium business aspect; Government (macroscopic) aspect; ICT variables; and financing aspect. These aspects could be developed further according to needs and focus of the problem. However, this study only focuses on creating a basic platform of MSMEs system in Indonesia.

After building the model, it is recommended that the Government should increase the level of ICT level for every type of enterprises to increase income by holding seminars and training for MSMEs, especially to micro and small enterprises to enhance their knowledge. Second recommendation is to support tax reduction for MSMEs to arouse the number of MSMEs and quickly elevate their status to a larger type of enterprise (i.e. micro elevating to small enterprise). The last suggestion, even though may be for long run suggestion, is attainable; since internationalization of SMEs in other countries was already attempted [29], [30], [31]. Further research of this model would be a simulation to confirm whether these suggestions create significant changes to economic development and further expansion of the model may be necessary .

REFERENCES

1. P. Ibarrarán, A. Maffioli, and R Stucchi, "SME Policy and Firms' Productivity in Latin America," Working paper No. 4486, 2009. Retrieved from http://hdl.handle.net/10419/36208www.econstor.eu
2. OECD, "SME and Entrepreneurship Policy in Indonesia 2018. In OECD Studies on SMEs and Entrepreneurship," [Online], 2018. https://doi.org/10.1787/9789264306264-en
3. R. K. Singh, S. K. Garg, and S. Deshmukh, "The competitiveness of SMEs in a globalized economy: Observations from China and India," *Management Research Review*, vol. 33(1), 2018,pp. 54–65.
4. OECD, "OECD SME and Entrepreneurship Outlook," 2005, [online] Retrieved from https://stats.oecd.org/glossary/detail.asp?ID=3123
5. European Commission,"What is an SME?," n.d.
6. Kementerian Koperasi Perkembangan Data Usaha Mikro, Kecil, Menengah (UMKM) dan Usaha Besar (UB) Tahun 2016 - 2017. [online], 2017. Retrieved from http://www.depkop.go.id/uploads/laporan/1549946778_UMKM 2016-2017 rev.pdf
7. S. Biswas, S. Roy, and S. Seshagiri, "Collaboration in Indian SME Clusters: A Case Study," *The 3rd International Conference on Communities and Technologies*, 2007,pp. 28–30.
8. C. Mambula, "Perceptions of SME Growth Constraints in Nigeria," *Journal of Small Business Management*, vol. 40(1), 2002, pp. 58–65.
9. Z. Griliches, "Issues in Assessing the Contribution of Research and Development to Productivity Growth," *The Bell Journal of Economics*, vol. 10(1), 1979, pp. 92–116.
10. J. Baumann and A. S. Kritikos, "The Link between R&D, Innovation and Productivity: Are Micro Firms Different?" Working paper No. 9734, 2016.
11. G. Frempong, "Trends in ICT Usage by Small and Medium Scale Enterprises in Ghana," *African Technol Dev Forum J.*, vol. 4(1) 2007, pp. 3–10.
12. T. A. Lubis and J. Junaidi, "Pemanfaatan Teknologi Informasi pada Usaha Mikro Kecil dan Menengah di Kota Jambi, "*J Perspekt Pembiayaan dan Pembang Drh.,"* vol. 3(3), 2016, pp. 2338–4603.
13. S. Mensah, "A Review of SME Financing Schemes in Ghana," 2004, [online] Retrieved from http://www.semcapitalgh.com/downloads/research/SME_Financing_Schemes_in_Ghana.pdf
14. Y. Dong and C. Men, "SME Financing in Emerging Markets: Firm Characteristics, Banking Structure and Institutions," *Emerging Markets Finance and Trade*, vol. 50(1), 2014, pp. 120–149.
15. P. C. Johnsen and R. G. P. McMahon, "Cross-industry Differences in SME Financing Behaviour," *Journal of Small Business and Enterprise Development*, vol. 12(2), 2005, pp. 160–177.
16. I. O. Oyefuga, W. O. Siyanbola, O. O. Afolabi, A. D. Dada, and A. A. Egbetokun, "SMEs Funding: An Assessment of an Intervention Scheme in Nigeria," *Management and Sustainable Development*, vol. 4(2), 2008, pp 233.
17. S. Siahaan, "7 Poin Penting dalam PP 23/2018 Tentang PPh Final 0,5%," 2018, Retrieved April 24, 2019, from Online Pajak website: https://www.online-pajak.com/7-poin-penting-dalam-pp-232018-tentang-pph-final-05
18. A. Mourougane, "Promoting SME development in Indonesia," Working paper No. 995, 2018.
19. J. Forrester, "Urban Dynamics*". Industrial Management Review*, vol. 58, 1969.
20. C. Bianchi, and E. Bivona, "Opportunities and pitfalls related to e-commerce strategies in small-medium firms: a system dynamics approach," *System Dynamics Review*, vol. 18(3), 2002, pp. 403–429.
21. M. J. Schmidt and M. S. Gary, "Combining system dynamics and conjoint analysis for strategic decision making with an automotive high-tech SME," *System Dynamics Review*, vol. 18(3), 2002, pp. 359–379.
22. S. A. Shane, "How Many Small Businesses Will Go Broke During the Recession?" ,2009, [online] Retrieved April 26, 2019, from New York Times website: https://boss.blogs.nytimes.com/2009/06/22/how-many-entrepreneurs-will-go-bankrupt-during-the-recession.
23. N. H. Wellalage and S. Locke, "Factors Affecting the Probability of SME Bankruptcy: A Case Study on New Zealand Unlisted Firms," *Business Journal for Entrepreneurs (Quarterly)*, June, 2012.
24. H. Kraemer-Eis, M. Schaber, and A. Tappi, "SME Loan Securitisation - An Important Tool to Support European SME Lending," Working paper No. 2010, 2010, Retrieved from http://hdl.handle.net/10419/176637www.econstor.eu
25. A. Pekmezovic and G. Walker, "The Global Significance of Crowdfunding: Solving the SME Funding Problem and Democratizing Access to Capital," *Business Law Review*, vol. 7(2), 2016, pp. 347–348.
26. J. J. Madill, G. H. Haines, and A. L. Riding, "The role of angels in technology SMEs: A link to venture capital," *Venture Capital*, vol. 7(2), 2005, pp. 107–129.
27. J. Smolarski and C. Kut, "The impact of venture capital financing method on SME performance and internationalization," *International Entrepreneurship and Management Journal*, vol. 7(1), 2011, pp. 39–55.
28. S. Blili and L. Raymond, "Information technology: Threats and opportunities for small and medium-sized enterprises," *International Journal of Information Management*, vol. 13(6), 1993, pp. 439–448.
29. J. W. Lu and P. W. Beamish, "SME internationalization and performance: Growth vs. profitability," *Journal of International Entrepreneurship*, vol. 4(1), 2006, pp. 27–48.
30. H. Matlay, M. Ruzzier, R. D. Hisrich, and B. Antoncic, "SME internationalization research: Past, present, and future," *Journal of Small Business and Enterprise Development*, vol. 13(4), 2006, pp. 476–497.
31. A. R. Reuber and E. Fischer, "The Influence of the Management Team's International Experience on the Internationalization Behaviors of SMEs," *Journal of International Business Studies*, vol. 28(4), 1997, pp. 807–825.

AUTHORS PROFILE

Tutik Inayati is a university lecturer in Entrepreneurship Department in Bina Nusantara School of Creative Technology, Bandung. She graduated from Institut Teknologi Bandung from her bachelor to Doctoral degree. She received the opportunity to join double degree program between Institut Teknologi Bandung and Tokyo University of Science, Japan. She is mostly familiar with using System Dynamics as a tool in Systems Thinking as part of complex problem solving. Her research topic's interest is in brain drain, international migration, and technology policies; and lately, she is interested in MSMEs performances in Indonesia. She is also a member of Indonesia's Higher Education Lecturer Association.

Ignatius Edward Riantono is a university lecture in Accounting and Finance Department, Bina Nusantara University in Jakarta. He graduated from University of Surabaya for his bachelor degree and Tarumanegara University, Jakarta for his master degree, both in accounting major. His proficiency of knowledge in accounting generates several seminal publications and he actively joins research groups in his department with various research focuses. Aside from research, he also holds workshops and trainings as his contribution to communities. He is also an active member of Institute of Indonesia Chartered Accountants.

Tjia Fie Tjoe is a university lecturer in Entrepreneurship Department in Bina Nusantara School of Creative Technology, Bandung, Indonesia. She graduated from Bina Nusantara University, Indonesia both for he bachelor and master degree. Her bachelor degree major is in Computer Science and her master degree major is in Management. She has been teaching for Bina Nusantara University since she graduated. She also produced several publications and was involved in many research groups at the university. Her research interest is in good governance, strategic planning, marketing, and human capital.