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Research Article

Examine the Competencies for Upskilling in VUCA Era (Volatility, Uncertainty, Complexity and Ambiguity) in Indonesia

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Abstract.
A fundamental transformation in competency development is needed to create a smart civil servant and smart governance in the context of VUCA (volatility, uncertainty, complexity, and ambiguity). The first step in the transformation is to define the competencies that are needed to address the challenges that occur. The findings of this study suggest new competencies to target for upskilling—the process of continuous learning for new skills—through formal training, self-learning, internships, and benchmarking. A focus group discussion with three ministries (the Ministry of Communication and Informatics, the National Research and Innovation Agency, the Ministry of Education, Culture, Research, and Technology) and a survey with a total of 416 Civil Servant from ministries, non-ministries, and provinces/districts, revealed that there is a change in the work environment nowadays, which makes the existing competencies need to be improved through upskilling. Based on the data finding there are two policy recommendations: 1. First, improvements are needed in the substance of upskilling/competency development so that it is more relevant to today's changing environment. Collaboration was found to be the most important competency, and this finding supports the need to achieve the target of smart governance. Digital IT competency is needed in terms of smart governance through the collaboration. 2. Second, change in competency development methods from analog to digital, from pedagogy to heutagogy, and from training to learning.

Keywords: VUCA (volatility, uncertainty, complexity and ambiguity), gap competencies, upskilling, competency development, Indonesia

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1. INTRODUCTION

The Covid-19 pandemic and the acceleration of digital transformation have had an impact on the way people work, the way people do activities, where we are faced with conditions where there is large-scale change (volatility), difficulty in making accurate predictions (uncertainty), the complexity of challenges due to various interrelated factors (complexity), and the ambiguity of an event with a chain of consequences (ambiguity) or what is known as the VUCA criteria (1). VUCA describes an environmental situation

that is completely uncertain, fluctuating, complex, difficult to predict and the truth of reality is subjective.

As a response to this, adapting is the way that many organizations choose. Adjustments are made by the organization, among others, by constantly learning, generating new ideas, responding productively to change, and innovating (Kanter, quoted in Budiharto et al., 2019). How to work using technology and an agile mindset is something that many organizations do where information technology capabilities are believed to produce an agile organization (Ravichandran, quoted in Bundtzen & Hinrichs, 2021). Adjustments to the way organizations work remotely have begun when the industrial revolution 4.0 with its characteristics, namely Big Data, Internet of Things, and Technology Disruption. In Indonesia, the acceleration of digital transformation into everyday life began to run officially and massively when in 2018, the Indonesian government committed to implementing the Industrial Revolution 4.0 by launching ”Making Indonesia 4.0” which is an initiative of the Indonesian government in implementing strategies and roadmaps of Industrial Revolution 4.0 in Indonesia.

In response to this change in the strategic environment of government, the concept of smart governance is known. Smart governance is the widespread adoption of a more community-based governance model with greater connectivity facilitated by new technology (4). It can be concluded that smart governance is governance based on collaboration between government and non-government agencies by utilizing communication and information technology to realize development goals in an effective, inclusive and sustainable manner.

In line with this, improving the quality of human resources is another main focus because a sophisticated system without qualified users will certainly not lead to achieving the goals. The 2020-2024 Rencana Pembangunan Jangka Menengah Nasional (RPJMN) National Medium-Term Development Plan has one the main focuses, specifically increasing quality and competitive human resources. This surge in human resources—in the government sector, leads to the government’s target to realize Smart State Civil Apparatus (Smart ASN). Smart ASN is a profile of civil servant—state civil apparatus that has a global perspective, mastering IT, foreign languages, innovative, adaptive and good networking to realize world-class bureaucracy (5). Smart ASN is expected to have qualified quality as a digital agent in supporting digital transformation in the era of the Industrial Revolution 4.0 and VUCA.

Related to issues of VUCA, Smart Governance and Smart ASN, in 2021, The National Institute of Public Administration Republic Indonesia, conduct a survey to know the perception of leader in the government sector toward the “work environment in recent

years"; "challenges and task that needed in the new era"; "competencies that needed to address the challenges". The respondent was the Director/Head of Agency, Head of Sector, Head of sub-sector with total 820 respondents from the provincial governments of West Java, Central Java, Special Region of Yogyakarta and Maluku.

Several finding from the survey are: 1. 98% of the respondents agree that the work environment that they are experiencing now is different than before; 2. Innovation, digitalization and human resource development are the top three challenges that chosen by the respondents; 3. To address this challenge, innovative thinking, agile mindset, ethic-integrity and collaborative ability are the top four attitude/behaviour that were chosen by respondents; and lastly, 4. To address this challenges, competency that needed to develop, digital technology, effective communication, building collaboration and managing change are the most chosen by respondents.

Based on the result of the survey there is awareness among the leader of the government that there was difference work environment and challenges nowadays; furthermore, existing competencies are not relevant anymore. To close the gap between the existing competencies and future competencies that needed, upskilling is one of way to achieve that.

2. THEORETICAL STUDY

The need for upskilling in the government sector can be done through the right competencies target and the right model of competency development. Related to that, empirical studies about competencies, that are needed in the government sector to face the VUCA era, still limited and if there are any it is a separate study or in private sector.

The concept of VUCA itself, Bennett & Lemoine (2014), in their continuous research looked at the four acronyms of VUCA in more detail, Volatility: relatively unstable change, understandable but change is frequent. Bundtzen & Hinrichs (2021) in more later research also said that a volatile environment can be referred to as being an unstable and unpredictable change. It is certain that change constantly happens but there is no information about the point of time, magnitude, and direction the environment adjusting. Uncertainty: Lack of knowledge on what and how significant changes will happen describes the term uncertainty. Bennett & Lemoine (2014), furthermore explain that information is really important to reducing uncertainty. Complexity: Where many interconnected parts are involved in one event, forming an elaborate network of information and procedure, some cases aren't related to significant change. Ambiguity:

In ambiguous situations, it is hard to identify the cause-and-effect relationships. Ambiguous situations usually represent new products, market structures or technologies. Due to the new nature, a responding by gathering information or having slack resources does not prepare an organization to cope with ambiguous issues (Bundtzen & Hinrichs, 2021). To deal with ambiguous situation, experimentation is necessary, where leader can determine what strategies better to face the situation.

The list of competencies that needed to deal with the new environment, Shet & Pereira (2021), in their research found that in response to 4.0, there are 14 competencies that needed to master by managerial leader i.e., agility, entrepreneurial intelligence, business acumen, design thinking, disruptive leadership, collaborative mind-set, problem solving & decision-making, research orientation, connected technology architecture, data analytics, project leadership, robotic process automation, digital intelligence & modelling, and sustainability—as crucial to Industry 4.0.

In another study from OECD about Leadership competencies for a high performing civil service found that there are challenges that face by leader in public sector:

“Leader in public sector has so many challenges. Leader in public sector expected to address ongoing and emerging policy concerns and improve the impact of public services, collaborate across organizational boundaries, sectors, and jurisdictions. They must make room for innovation while controlling risk and holding themselves accountable for outcomes. They must support fast-paced political agendas, manage and reform large government organizations, engage and inspire their workforces, and be trusted partners to citizens and a growing array of partners and stakeholders. All while maintaining the highest standards of personal and professional integrity and ethic.

Furthermore, to address the challenges above, OECD (2020) grouping leadership capabilities of Senior Civil Service into 4 capabilities:

“1. Values-based leadership: Individual SCS must balance many, often conflicting values in order to make decisions to solve the public problem; 2. Open inclusion: Successful leaders challenge their own perceptions by seeking out voices and viewpoints other than their own (open) and ensuring that these voices can contribute to their leadership problems in a secure environment (inclusion); 3. Organisational stewardship: SCS reinforce a trust- and values-based culture and providing their working environment with the necessary skills, resources, and working conditions; 4. Networked Collaboration: the important capabilities that leader should be collaborate beyond the organization with other government actors, private, and society.

Another list of competencies come from Baran & Woznyj (2021), that agility is necessary for effective management of VUCA. Also in more individual level, adaptive

performance, that includes competencies such as, digital learning capability, handling crisis or emergency and stress management include in agility capabilities. Bundtzen & Hinrichs (2021) built the competencies model that comprehensively compile the four concepts of VUCA of agile characteristic to deal with VUCA forces.

Table 1: Agil characteristic to deal with VUCA forces.

Volatility, core Enabler	Uncertainty, core Sensing
Flexibility	IT& data systems
Slack resources	Knowledge gathering
Decentralized power	Customer focus
Complexity, core Practices	Ambiguity, core Responses
Environmental match	Innovation
Cross-functional Teamwork	Proactivity
Iterative work&learning	Experimentation

In summary, there are competencies that repeatedly mention by Shet & Pereira (2021), (Gerson, 2020), OECD (2020), Baran & Woznyj (2021) that needed by leader in government sector i.e agility, collaboration, digital capability; among many other competencies that needed for upskilling in VUCA era.

3. METHODS

This study aims to provide a list of competencies that need to be addressed for leader in public sector to achieve the goals of Smart Governance and Smart ASN in the VUCA era. This study will use qualitative-quantitative methods to collects data through focus group discussion and survey.

3.1. Focus Group Discussion

Focus Group Discussion was held with the purpose to compare of the perspective through different ministries toward VUCA, Smart Governance and Smart ASN. Point of discussion in the group interview:

1. Perception about Smart Government, Smart ASN, VUCA (Volatility, Uncertainty, Complexity, Ambiguity)
2. Challenges in existing work environment, job and task of civil servants
3. Current/existing competencies of civil servants

4. Competencies needed for upskilling/reskilling in VUCA era

3.2. 3.2. Survey

To analyze the importance of the competencies and competency development method a survey was conducted. Based on the previous survey and literature review, there are several competencies that needed to confirmed, the urgency and how to achieve those competencies through competency development.

TABLE 2: Content and Type of Question of the Survey.

SECTION OF THE SURVEY	TYPE OF QUESTION
Perception about VUCA In this section, the purpose of the questions is to know the Perception of respondent about Smart Government, Smart ASN and VUCA (Volatility, Uncertainty, Complexity, Ambiguity)	Likert-type questions collect ordinal data using rating scales with 5 or 7 points.
Existing condition and competencies In this section, the purpose of the questions is to know the challenges in existing work environment, job and task of civil servant. Current/existing competencies of civil servant	Likert-type questions with ordinal variables include categories that can be ranked.
Upskilling-reskilling Competencies needed for upskilling/reskilling in VUCA era Method of competency development to upskill	Likert-type questions with ordinal variables

Numbers of sample that needed to picture the population of civil servants in Indonesia was calculated with the Cochran Formula and Yamane Formula. Population of civil servants in Indonesia is 3.995.634 with the 0,5 maximum variability, 95% confident interval and margin error 5% then we get the number of the sample needed is 385 – 400 respondents.

With Cochran Formula the sample = 385

$$n_0 = \frac{Z^2 pq}{e^2} \frac{1.96^2 * 0.5 * 0.5}{0.25}$$

With Yamane Formula the sample = 400

$$n = \frac{N}{1 + N(e)^2} \frac{3995634}{1 + 3995634(0.5)^2}$$

Cross table and chi square method was used to understand the relationship between questions in the survey: a. to understand the correlation of the question “the perception/understanding of VUCA” and the question “importance of components of VUCA”;

b. to understand the relation between the question of “what is the challenge that you face the most in the job” and the question “competencies of VUCA that important to face the challenges in these nowadays job”.

Index of the importance of the competencies was obtained from the cross table and chi square result of the competencies and the gap of each of competencies.

Research Questions:

What competencies that needed to address the challenges in VUCA Era and implementation of Smart Governance-Smart ASN in Indonesia?

4. Data Result

To know whether civil servant in Indonesia aware of the situation they are currently in, the challenges and what competencies they need to be obtained, focus group discussion (FGD) and survey was held. The participant of FGD was from three ministries/agencies to capture the different perspective from each ministry/agency, which is: Director Ministry of Communication and Informatics, Researcher National Research and Innovation Agency and Director Ministry of Education, Culture, Research, and Technology. Total respondents of the survey was 416 civil servants with of duration of the job that was divided into five groups: 1-5 years, 5-10 years, 10-15 years, 15-20 years and over 20 years from Ministry, Non-Ministry and Province/District.

4.1. Perception of VUCA

The first question of the FGD and Survey was to get to know the level of knowledge of the participant about the concept of VUCA and their perception of the impact of the VUCA to their work life, “What is your perception about VUCA (Volatility, Uncertainty, Complexity, Ambiguity) and its impact to government sector”, from the result, there were mixed perception of VUCA, that one of participant of FGD (Ministry of Communication and Informatics) has perception that VUCA is not too impactful for government sector:

“We already move forward when President gave us instruction to build e-government for the pilot project of other institution. Also, I think government sector still have time to adapt while for private sector they need to transform immediately, if not they will lose their consumer”

The reason why one of participants said that VUCA not too impactful to government sector is because Ministry of Communication and Informatics has started the new way of work and the digital transformation early, through target of e-government.

Two others interviewee agree that there was impact of VUCA to government sector, such as: work from home system, the urge to transform the public service with technology-online system through new policies/regulation to adapt with the new environment.

“National research and innovation agency implementing work from home for their researcher, we only need to meet the target of outcome for that day and the report our outcome in the online system”

“Because of COVID, some of service in Ministry of Education, Culture, Research, and Technology need to be in online, for a while, in the beginning of the COVID we even need to outsource IT staff to build online system”

The same result shown by survey where over 70% respondents know the concept of VUCA and the abbreviation and aware that there is difference in work environment nowadays.

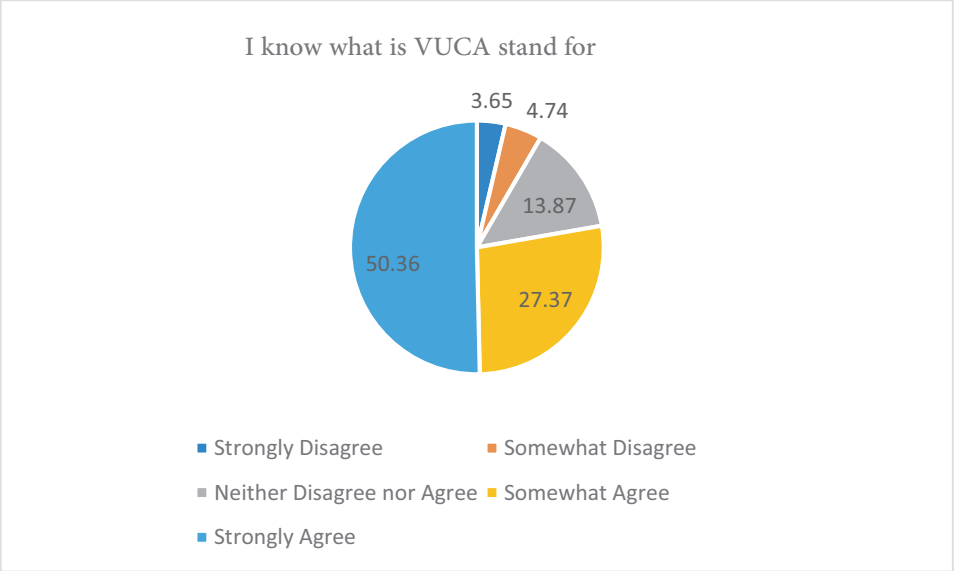

Figure 1: Result of the Survey Concept of VUCA.

To get more information from the question, I did some of basic of analysis use STATA**,** based on statistical analysis of cross table and chi square using STATA as showed in the appendix A, there is relationship between question of perception/understanding of VUCA and question of importance of components of VUCA, where it showed significant result. It means that people who understand and aware of the VUCA concept also aware of the importance of the competencies to address the VUCA challenge.

4.2. Challenges in existing work environment, job and task of civil servants

In order to get to know competencies that important to achieve, the next section was to know the challenges nowadays and what are the things that change from their work life. Based on the result from the survey through question “what is the different of work environment from 5 years ago?” 35,48% of respondents agree that the difference in the work environment is about complexity, 32,2% is about of the volatility, 15,35% respondents votes uncertainty and 13,90% is about ambiguity.

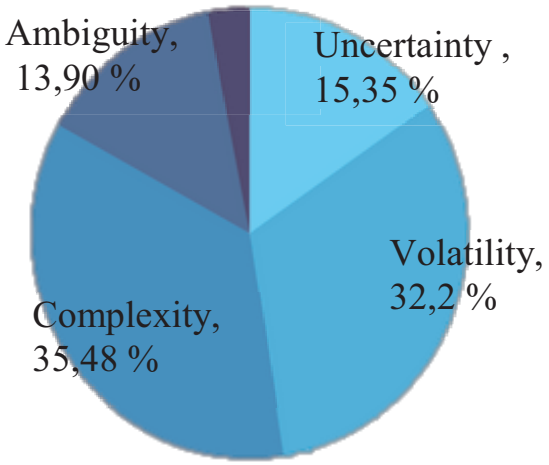

Figure 2: Result of the Survey of Difference in the Work Environment.

Next question is “What is the challenges in existing work environment, job and task of civil servant”, interviewee from Ministry of Education, Culture, Research, and Technology said that fast pace of policy to change and fast outcome are the challenges that he often to face and demand for innovation/transform the service through technology.

“Because of the rapid change in the environment and we are in government sector where everything governed by regulation, then we need to change the regulation every other day. It is tiring because its need collaboration with other division and ministry of law and human rights. Also because of the demand from the top leader to adapt fast and to came with outcome fast”

As for interviewee from National Research and Innovation Agency, based on the research that she did before about future demand for civil servant, stated that the challenge also about reputation of the leader. The leader tends to follows the other leader for new policies/regulations.

"it is suprising that based on the interview with the leader in government sector, they said that there is urge to follow other for the new policies otherwise they will get complaint from public"

She also added the need of collaboration in build the information and communication technologies:

" Every agencies now in competition to make new website without consider the architecture of the system as a whole, comprehensive and complete system. This is an urgent matter for agencies to collaborate through one portal public service system"

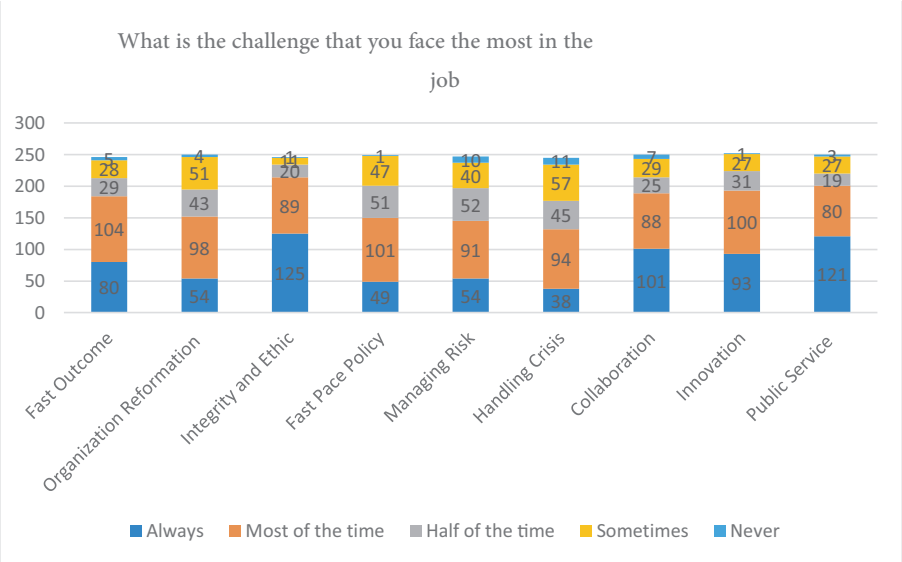

Figure 3: Result of the Survey Challenge in Job Nowadays.

As for the result from the survey, in the top three, "integrity and ethic" are the top challenges that they always face, followed by "demand to improve public service" and "collaboration across division and organization".

4.3. Current/existing competencies of civil servants

For the question of "What is the current/existing competencies of civil servant, is there any gap?" all of the participant agree that there are big gap in the competencies of civil servants, precisely for the agility-resilience of change in the environment, digital ability and collaboration across boundaries as to implement the smart governance through technology and face pace policies they need to make connection/network outside the organization, across the ministries/agencies.

The result from the survey about perception of civil servants on gap of competencies between existing competencies and VUCA's competencies with the question "In my

agency there is currently a big gap between these competency and the actual attainment of the competency among leader in my agency". Based on the Appendix B, we got the percentage of each of competencies for the agreement of the gap competencies. The top three competencies that has the most vote for the gap are "collaboration", followed by "innovation" and "communication"..

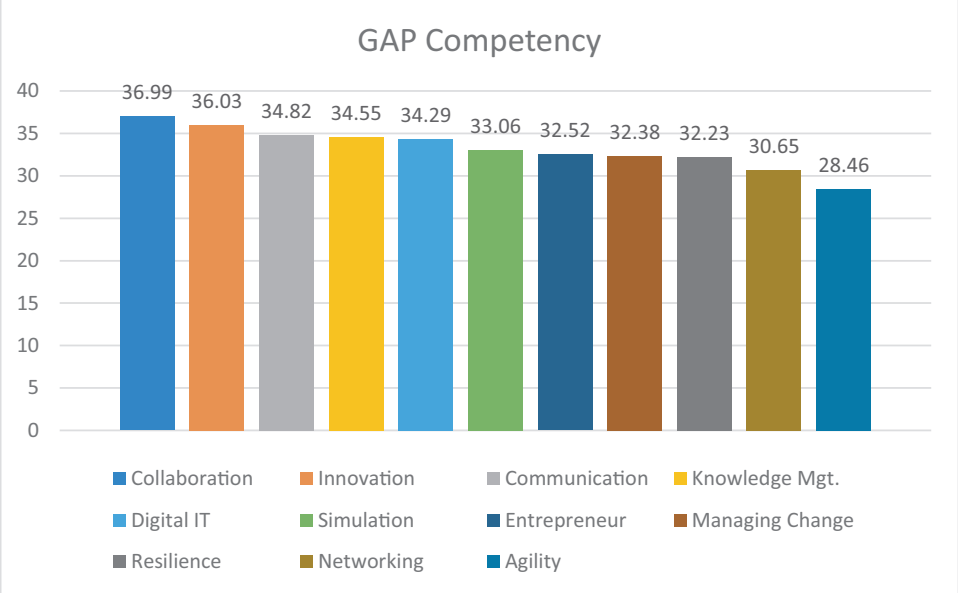

Figure 4: Result of the survey GAP of Competency.

4.4. List of Competencies

Based on the and previous survey, literature review and FGD, the list of competencies as show below:

TABLE 3: List of Competencies.

Volatility	Uncertainty
Agility Resilience	Digital competencies Managing change Knowledge management
Complexity	Ambiguity
Networking and connection, Proactive collaboration, cross agency, cross team, private-society Culture driven communication	Inovative thinking Entrepreneurial intelligence Simulation, experiment

4.4.1. VUCA Challenges and VUCA Competencies

To examine the relevancy of the challenges and competency, cross table and chi square was use. Cross table and chi square of "Managing Risk" with "Competency Agility",

"Resilience", "Digital IT", "Managing Change", "Knowledge Management", "Networking", "Collaboration", "Communication", "Innovation", "Entrepenuer" and "Simulation" as showed in Appendix B.

Based on the Appendix C, it's found that for the challenge "Managing Risk"; Resilience, Agility, Knowledge Management, Networking, Collaboration, Communication, and Entrepreneur Intelligence competency have significant result, which means there is relationship between those data.

After that, all of the challenges also got examine (see Appendix D) and the result as summarize in the table down below. Competency that has significant result represented by "1" and insignificant result represented by "0".

No	Challenges	Competency										
		Volatility		Uncertainty			Complexity			Ambiguity		
		Agility	Resilience	Digital IT	Managing Change	Knowledge Mg.	Networking	Collaboration	Communication	Innovation	Entrepreneur	Simulation
1	Public Service	1	1	1	1	1	1	1	1	1	0	1
2	Innovation	1	1	1	1	1	1	1	1	1	1	1
3	Collaboration	1	1	1	1	1	1	1	1	1	1	1
4	Handling Crisis	1	1	0	0	0	0	0	1	0	1	1
5	Managing Risk	1	1	0	0	1	1	1	1	0	1	0
6	Fast Policy Change	1	1	1	1	1	1	1	0	0	0	0
7	Integrity and Ethic	1	1	1	1	1	1	1	1	1	1	1
8	Reform Organization	1	1	1	1	1	1	1	1	1	1	1
9	Fast Outcome	1	1	1	1	1	1	1	1	1	1	1
	Frequency	9	9	7	7	8	8	8	8	6	7	7

Figure 5: Cross Table and Chi Square, Frequency of Competencies in Challenges.

Based on the result we can rank the competencies based on the frequency of appearance.

1. Agility and Resilience have significant result to all of the challenges and got value "nine" as it relevant to all the nine challenges;

2. Knowledge Management, Networking and Collaboration do not have significant result for the challenges of "Handling Crisis"; and Communication does not have significant result for the challenges of fast policy change, so this competencies only got value "eight";

3. Digital IT, Managing Change do not have significant result for the challenge "Handling Crisis" and "Managing Risk", so this competencies only got value "seven".

4. Entrepreneur doesn't have significant result for "Public Service" and "Fast Policy Change"; Simulation don't have significant result for "Managing Risk" and "Fast Policy Change", so this competencies only got value "seven"

5. Innovation doesn't have significant result for "Handling Crisis", " Managing Risk", and

"Fast Policy Change", so this competency only got value "six"

4.4.2. Degree of Need to Develop The Competencies

Based on the gap competencies (Figure 9) and the frequency of competencies (table 4) –that appear in each of challenge—, we can obtained the degree of need to develop for each of competencies.

	Competency										
	Volatility		Uncertainty			Complexity			Ambiguity		
	Agility	Resilience	Digital IT	Managing Change	Knowledge Mg.	Networking	Collaboration	Communication	Innovation	Entrepreneur	Simulation
Frequency	9	9	7	7	8	8	8	8	6	7	7
GAP Competency	28,46	32,23	34,29	32,38	34,55	30,65	36,99	34,82	36,03	32,52	33,06
Importance	256,14	290,07	240,03	226,66	276,4	245,2	295,92	278,56	216,18	227,64	231,42

Figure 6: Degree of Need to Develop the Competencies.

Based on the result shown in the table, collaboration got the most highest value, that means that there is need to upskill the collaboration competencies as it appear in almost all the challenges and it has the highest gap of competency. Next competency is resilience, as it appears in all of the challenges and has the big gap; followed by communication competency, knowledge management, agility, networking, digital IT, simulation, entrepreneur, managing change and innovation.

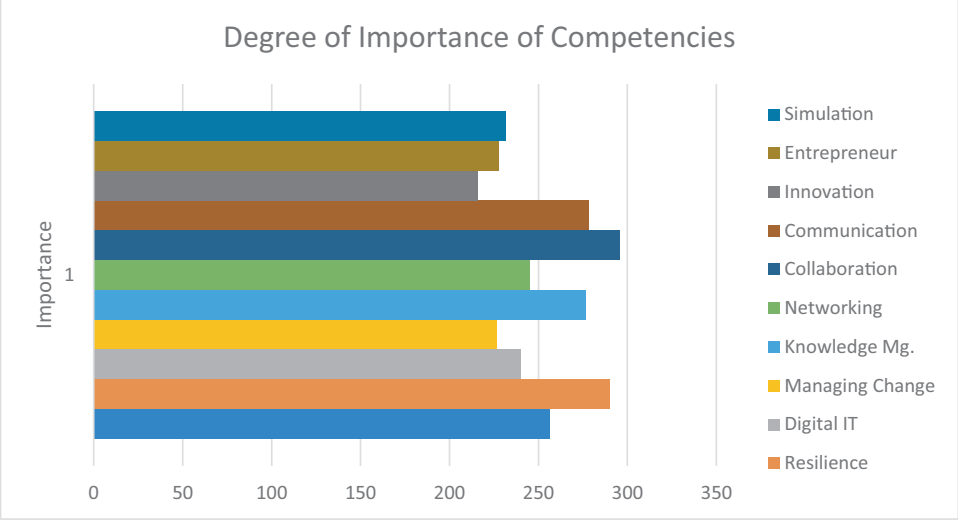

Figure 7: Degree of Need to Develop Competencies.

4.5. Method of Competency

Finally the survey try to find what kind of the activity of competency development that respondents like the most to develop their competencies. Self learning is the method that receive the highest votes, followed by formal training, degree, benchmark and internship.

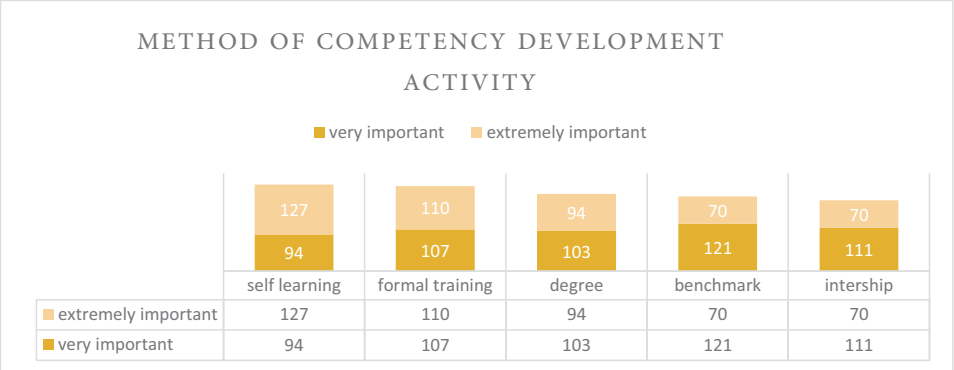

Figure 8: Method of Competency Development Activity.

5. Conclusion and Policy Recommendation

Based on the results there is a need to upskill the competencies of collaboration (one of competencies to address the challenge of complexity) as communication needed, including digital technical capability, reforms aiming to facilitate proactive collaboration within/outside government. This finding in line with the urgency of collaboration across boundaries that propose by Gerson (2020) in the OECD report about networked collaboration where the government should collaborate among agencies, ministries, private sector, society and cannot be alone in making public policies. The government should work with different stakeholders and outside the “circle” and adopt different model from traditional way of work. This finding is also in line with the challenges that are often faced by interviewee and survey’s respondents in demand of fast pace policy change. It also support another finding from Shet & Pereira (2021) about the importance of collaborative mind-set to create technology-driven ecosystem. This also address the challenges that stated by interviewee from national research and innovation agency about the need of architecture technology system as a whole and comprehensive in Indonesian Government online system:

"Every agencies now in competition to make new website without consider the architecture of the system as a whole, comprehensive and complete system. This is an urgent matter for agencies to collaborate through one portal public service system"

Interesting finding was that innovation competencies become the least important competency as it is not relevant to four of the challenges (from nine challenges) that asked in the survey. As Gerson, (2020) in the OECD report, stated that leader now have a difficult challenges to innovate but also deal with the risk and be accountable of the outcomes.

The result of the importance of the competencies is also in line with the finding of the question "difference of work environment compare to 5 years ago", where 35,48% —the highest percentage result— of respondents agree that the difference in the work environment is about complexity.

Based on data finding there are two policy recommendation:

1. **Target of competency development**

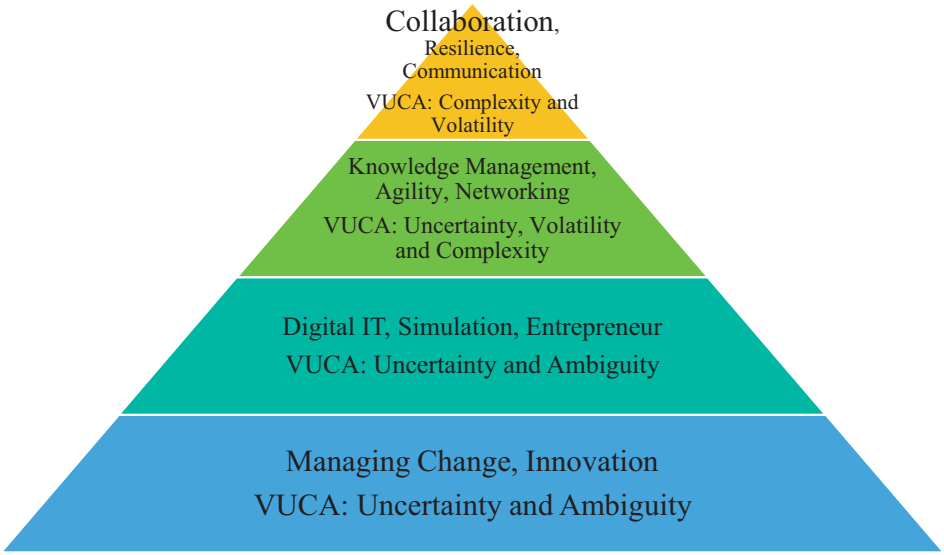

Figure 9: Index of the importance of the competencies-cluster of the competencies.

Improvements are needed in the substance of upskilling/competency development so that it is more relevant to today's changing environment. Collaboration found as the most important competency to be developed as it supports the need to achieve the target of smart governance –where smart governance is governance based on collaboration between government and non-government agencies by utilizing communication and information technology to realize development goals in an effective, inclusive and

sustainable manner— as digital IT competency needed it is in the in the term of smart governance through the collaboration.

As entrepreneurship intelligent needed to adapt with the new environment, it will go hand in hand with simulation/pilot project, to minimize the losses that may arise due to lack of ability to identify what is the reason behind some of the failure. In support with this, Bundtzen & Hinrichs (2021), stated that to deal with ambiguous situation, experimentation is necessary, where leader can determine what strategies better to face the situation.

1. **Direction of change in competency development**

Changes in the environment as well as demands to adapt, lead to new ways of carrying out work, including in the practice of implementing competency development as one way to realize the smart ASN target towards smart governance. There are at least three fundamental changes in competency development, namely:

1. Analog to digital

The direction of change from analogue to digital is where analogue living is characterized by physical/offline, requires more space, infrastructure, is not flexible, and depends on space and time, while digital living is characterized by the use of information technology, does not require large space, does not require physical interaction and flexible.

2. Pedagogy to heutagogy

Source: (Hase & Kenyon, 2000)

The direction of changing the learning system in the classroom is from pedagogy to heutagogy. Pedagogy is a learning system where the teacher is the centre of learning in the classroom, learning takes place in one direction with the lecture method and minimal interaction. While heutagogy is a learning system that encourages participants to explore problems and then find solutions independently based on the results of the process of discussion and interaction with the teacher and fellow participants in the class.

3. Training to learning

The direction of change is from training to learning where learning is not only obtained through a special time in the classroom but takes place on an ongoing basis until returning to the workplace, where the learning resources not only from teachers but also from practitioners in the field or self-learning. The implementation of learning that was

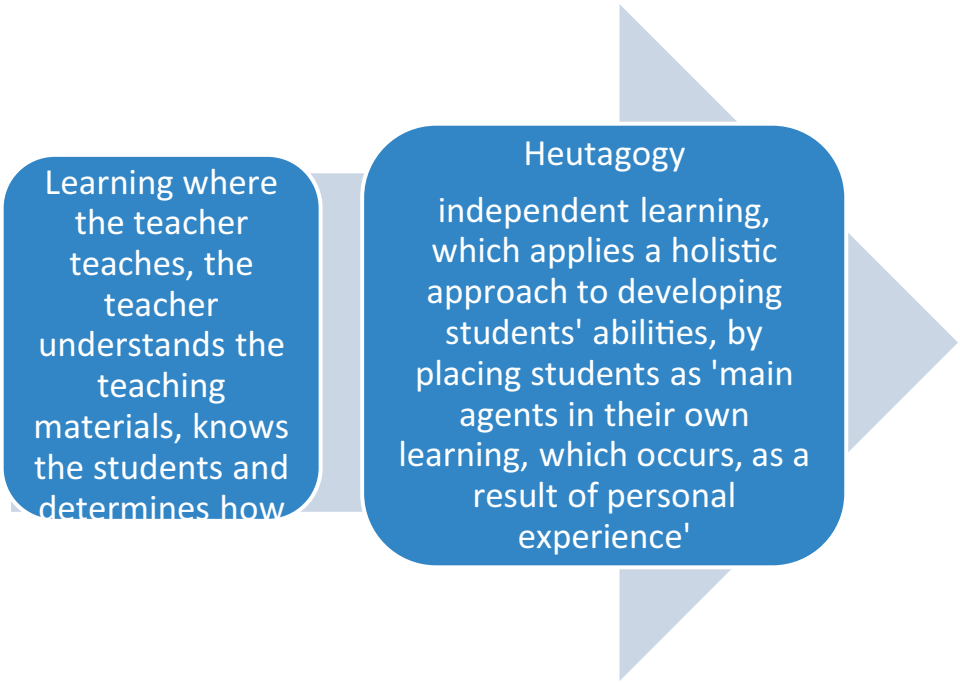

Figure 10: Pedagogy to Heutagogy.

originally manual and paper-based has now taken advantage of information technology and become paperless.

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