



Building a Peaceful and Inclusive Society for Sustainable Development: Challenges of Public Administration in the Era of Volatility, Uncertainty, Complexity, and Ambiguity (VUCA)

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Abstract. Currently, every country in the world is required to carry out sustainable development. Especially in the era of uncertainty or what we often call VUCA (Volatility, Uncertainty, Complexity, and Ambiguity). We often find situations where people will find it difficult to predict an accuracy that will occur in the future. One of them is in terms of building a peaceful and inclusive society. Public administration experiences challenges from time to time, including how policies are formulated and how countries can build peaceful, just societies and institutional strengthening to achieve sustainable development goals. This research is a study of the challenges of government organizations in facing the presence of the Internet of Things (IoT) and Artificial Intelligence (AI) in the implementation of electronic government and its relation to efforts to realize the Sustainable Development Goals (SDGs). This research is a qualitative research using secondary data. The output of this research is a scenario of public policy formulation at the National Cyber and Crypto Agency (BSSN) in the preparation of the Cyber Room Radio Access Network (RAN Kamsiber). Another finding of this research is that there are weaknesses in public administration in the VUCA Era caused by the capabilities of human resources apparatus and existing facilities and infrastructure, including the use of technology. Vital information infrastructure needs to have a high level of risk management to face the VUCA Era.

Keywords: Public Administration, VUCA, SDGs

1 Introduction

Public administration in the current era faces various challenges that are very dynamic and complex. Rapid and unpredictable changes are often referred to as VUCA (Volatility, Uncertainty, Complexity, and Ambiguity). Volatility comes from rapid and frequent changes, uncertainty indicates a lack of predictability and uncertainty in the future. Complexity shows the various factors that are interrelated with each other, and ambiguity describes the unclear cause and effect in various situations and conditions. This situation requires an innovative and adaptive response from public administration managers.

The world today requires every country to carry out a sustainable development [1]. One of the main goals in sustainable development is to build a peaceful and inclusive society. This goal is in line with the 16th Sustainable Development Goals (SDGs) which emphasize the importance of promoting a peaceful, just and inclusive society. Sustainable development does not only refer to economic and environmental aspects, but also refers to social aspects that involve social justice and inclusiveness. Public administration plays an important role in achieving these SDGs, by developing policies and programs that ensure all individuals have equal access to social justice and welfare.

In achieving a peaceful and inclusive society in this VUCA era, the challenges faced by public administration are diverse. One of the main challenges is how to respond to rapid and unpredictable changes with the birth of flexible and adaptive policies. In addition, addressing the complexity of social, economic and political problems requires an integrated and collaborative approach between various sectors and stakeholders. Public administration must also be able to deal with uncertainty by providing mechanisms that support the social and economic resilience of the community.

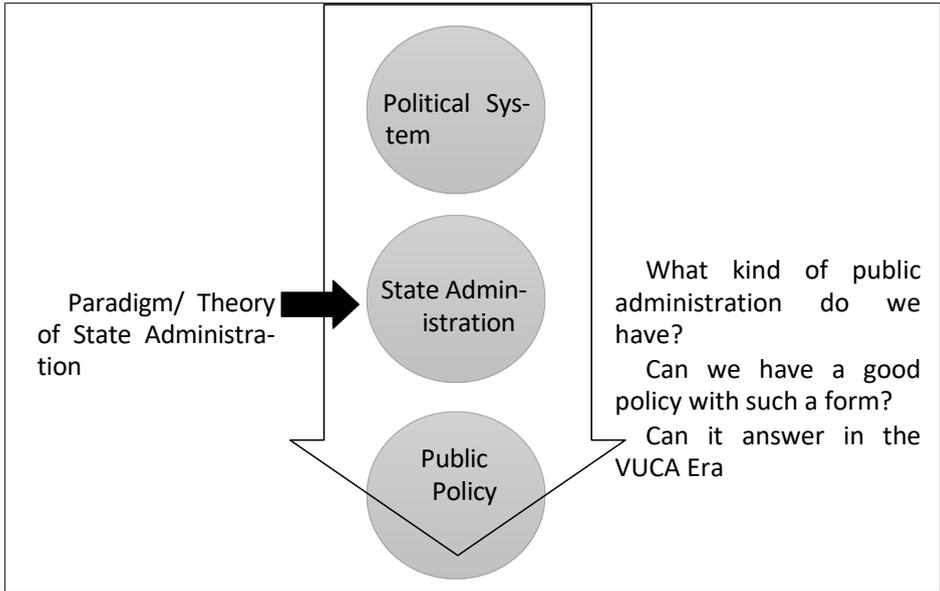
To overcome these challenges, innovative approaches in public administration are needed that can facilitate the achievement of sustainable development. Innovation in public policy, the use of information technology, and the development of the capacity and skills of public administration actors are key to creating peaceful and inclusive societies. Thus, effective public administration management in the VUCA era will be a crucial foundation for achieving sustainable development goals.

Effective as well as efficient administration plays an important role in achieving sustainable development goals (SDGs) that focus on peace, justice and strong institutions. To achieve this, a holistic approach is needed that covers various aspects of public administration.

In the context of public policy and administration, there are three main paradigms that are closely interrelated, namely the political system, public administration, and public policy. These three components are interrelated with each other because public administration acts as an instrument that can only run effectively when supported by a stable political framework and directed public policy. Without the synergy of these three elements, efforts to achieve the SDGs will encounter significant obstacles, because each element supports and strengthens each other in creating a responsive, transparent and accountable government.

In the political context, administration has also become a working tool to run the political system which then makes it a public policy product and of course, this context makes it different from the objectives of public administration or business administration. However, the process of formulating public policy should pay attention to various kinds of flows and scenarios and the hierarchy of a bureaucracy working.

Fig. 1. Paradigm/Theory of State Administration

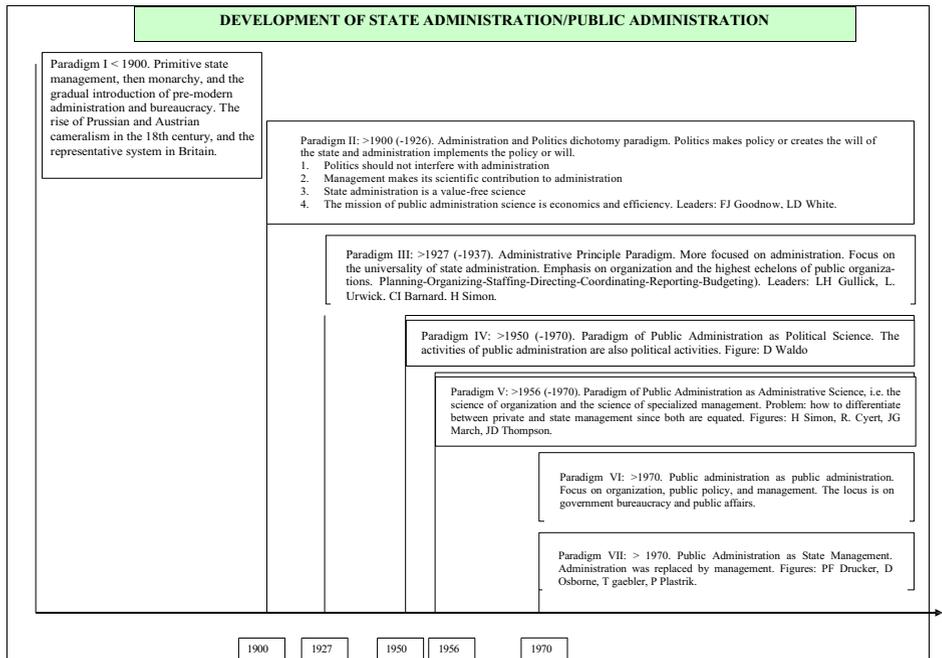


Source: Public Policy Book: Formulation of Public Policy

To get a fundamental understanding, especially of public administration, of course we must look at the history of how the philosophy of the presence of public administration and how Indonesia is part of the implementation and adaptation of public administration itself.

Consider the following flow and development of public administration:

Fig. 2. Development of Public Administration



Source: Public Policy Book: Formulation of Public Policy

By paying attention to these developments, of course we can look at the history of the Feudal State Administration paradigm (Royal Era to the present). Knowing the paradigm of state administration, of course we will understand the challenges of each paradigm, starting from the first paradigm to the present. However, each challenge has different patterns and operational scope. That's where it becomes very important in the current impasse. We must be able to answer all these challenges, especially along with the presence of the Internet of Things (IoT) and Artificial Intelligence (AI).

In the era of uncertainty or what we often call VUCA (Volatility, Uncertainty, Complexity, and Ambiguity) we often get a picture of a situation where people will find it difficult to predict an accuracy that will occur in the future. This is because the VUCA era is filled with unclear, directionless, situations that tend to change very quickly from unclear causes and effects.

This uncertainty is a challenge in all aspects of the private world such as business, society, and government systems. Public administration, as a government system for formulating policies, is also affected by the uncertainty that occurs in this VUCA era. In this era, to overcome this condition, it is necessary to apply some strategies like vision, understanding, clarity, and agility [2]. According to Evans (2018), there are at least two main challenges facing public administration in the era of digital uncertainty. First, improving the experience of technology-based public service quality. Second, increasing the ability and competence of digital-based administrative science as the main actors of public services.

The toughest challenge in running state administration in the VUCA era is the occurrence of bureaucratic pathology. Bureaucratic pathology describes deviations that occur within a bureaucracy. Bureaucratic pathology is generally the result of a long hierarchical chain, specialization and formalization of bureaucracy and incompatible bureaucratic performance. However, the pathology of the bureaucracy continues to and endless from the time to time, almost every year the government takes the time to think about how to prevent the pathology of the bureaucracy that has always incited the unjust society [3]. The impact of bureaucratic pathology is paternalism, large budget increases, complicated and long-winded procedures, bureaucratic breakdown, or bureaucracy becomes very complex. To deal with these things, the government seeks to create a dynamic public service system to deal with critical matters.

As a form of bureaucratic pathology, the VUCA era is actually an inseparable part of the public and public administration dichotomy. This means that we need to find the right ways and steps how state administration can still implement public policies in the form of public services in the midst of an era of uncertainty. This is a challenge in government organizations and of course needs a critical idea and innovation to answer the novelty of the concept of state administration so that it can cover the VUCA problems that occur today. In the face of an increasingly integrated era of globalization and demands for increased efficiency and community satisfaction, the quality of excellent public services is the key to achieving sustainable development and improving people's welfare. [4][5].

Furthermore, the integration of SDG principle sixteen will enable government agencies to develop innovative and responsive strategies that not only address insecurity, but also strengthen institutions that support equitable and inclusive public services. This is expected to lead to a more peaceful and just life for society at large.

1.1 Public Administration

There are several paradigms in the study of public administration that explain that the political system, state administration, and public policy move straight to influence each other and produce public policy formulations. First, feudal state administration is self-serving, maintains the negative side of paternalistic culture, and teaches corruption behavior. Administration in this government system emphasizes orders, punishment, and obedience.

Second, the Weberian bureaucracy is impersonal, clear hierarchy, competence, contractual, given a fixed salary in the form of money, there is a clear career, workers are separated from work tools, and discipline. However, in this bureaucratic system, there are weaknesses, namely the system becomes too many employees so that it swells the budget, procedures become long-winded, wasteful, and unclear regarding responsibilities.

Third, the political-administrative dichotomy argues that the task of public administration is to implement public policy in the form of public services. Fourth, the most important thing in public administration lies in the efficiency and effectiveness of work. Thus, public administration should have the principles of directing, managing, providing workers, directing, harmonizing, reporting, and budgeting. Fifth, public administration as a political science. This is because basically, the existence of public administration cannot be separated from the political system. Thus, in the process of formulating public policy, the government will see a political approach to a political system that is used as a background in public policy decisions.

Fourth, the new state administration considers that improving quality and professionalism for the state is futile for the state. This is because basically the increase in government efficiency will be followed by a decrease in responsiveness or sensitivity to society. Therefore, this paradigm argues that public administration should focus on social justice.

1.2 Opportunities and Challenges for Public Administration

The development of public administration also affects regional governments (provinces, districts and municipalities) in the form of opportunities to establish direct economic links with the global economy. To illustrate, since the introduction of regional autonomy, the administrative territory of the Republic of Indonesia has expanded to 33 new provinces. As a result of this regional expansion, the number of administrative regions at lower levels has also increased, to 349 districts, 91 municipalities, 5,641 sub-districts and 71,555 villages, respectively. (BPS, Statistik Indonesia, 2005/2006: xiii). However, additional administrative regions have not been able to reduce socio-economic problems and improve the quality of services to the community.

The above review illustrates that the challenges of public administration are very complex, and certainly require a breakthrough if we want to get out of the multidimensional crisis as soon as possible. From the perspective of public administration, the existence of a nation state is essentially for the sake of improving the welfare of all its citizens. It is said so, because countries in the world are generally established as a "welfare state" regardless of the ideology and political system adopted. To achieve these noble goals, various types of organizations are needed, which are strong and reliable, both inside and outside the government environment to face challenges of different intensities, which will certainly be faced in the future.

1.3 Era Volatile, Uncertain, Complexity and Ambiguous (VUCA)

The reality of change gave birth to a VUCA (Volatile, Uncertain, Complexity and Ambiguous) situation where the world is very dynamic and difficult to predict, the term VUCA was born from the US Army War College, a graduate school for prospective generals in Carlisle, Pennsylvania. (Johansen, 2010), When the September 11, 2001 attacks occurred in New York, this term was used to describe chaos, and unexpected violence. VUCA became a trend after the crisis in 2008-2009, although the crisis has been resolved, times have changed. "We are moving from a world of problems, which demand speed, analysis, and the elimination of uncertainty to solve, to a world of dilemmas, which demand patience, common sense, and engagement with uncertainty" (Kinsinger dan Walch, 2012).

Kasali in *The Great Shifting* states that the massive change process in almost all sectors leads individuals to two choices, take control or be controlled by change. Organizational leaders must develop new patterns to help the organization to be able to exist and take part in this process, the role of leadership will change in the future. Bolden et al. (2016) stated that in the future the value of leadership must be strong and inclusive, we live where the rules of leadership are rewritten, the charismatic all-knowing and all-powerful leader is long gone, a leader must know when to coach, lead, facilitate and support.

The leadership of the future must be developed to address the needs and problems that arise from the uncertainty and ambiguity of the current situation. Uncertainty, also known as the VUCA era, makes collaborative management even more important. At the very least, a leader must be able to direct the group or organization he leads to work together, which is not only oriented towards solving problems, but must also unite the emotions, enthusiasm and motivation of the people. [6].

So that in addition to leaders who need to adjust their leadership style in the VUCA era, employees (in this case civil servants) are required to be able to adjust in the midst of VUCA conditions. It is crucial for civil servants to understand the offline and online context of users and their needs when accessing public services and should also have a strategy on how different services and channels are integrated from the perspective of the user and the organization to provide a coherent and successful experience. [7].

1.4 Sustainable Development Goals (Peace, Justice and Strong Institutions)

The Sustainable Development Goals called for by the global community are becoming increasingly important in a time of VUCA (Vulnerability, Uncertainty, Complexity and Ambiguity). In order to achieve peace, justice and strong institutions, political instability, armed conflict and legal uncertainty threaten the achievement of these goals. Addressing these challenges requires flexible and innovative approaches, including preventive diplomacy, comprehensive legal reform, and strengthening institutional capacity through technology and international cooperation.

In addition, the complexity of global issues such as corruption, climate change and migration, forces institutions to be adaptable and responsive. Leaders must use dynamic, data-driven strategies and risk analysis to manage volatility and reduce uncertainty. Even in an uncertain and complex environment, cross-sector collaboration and increased transparency are essential to remove ambiguity and ensure a more stable and just world [8].

2 Method

This research is a qualitative study using secondary data. Secondary data were identified using a systematic literature review (SLR) approach. The SLR technique is used to identify, evaluate, and interpret all relevant research findings related to a particular research question, topic, or phenomenon of concern. The purpose of the SLR method is to find strategies that will help address the problem, identify various perspectives related to the problem under study, and consider more deeply the challenges of public administration, highlighting theories relevant to this research case. Consider this in the VUCA era. The steps of the SLR method are as follows.

Also for secondary data for this study include a comprehensive review of existing literature such as research journals and books. These sources provide valuable insights and foundational knowledge that support the survey. The literature reviewed includes key studies on public administration, strategic management, and organizational behavior, with a focus on how these areas are influenced by the VUCA environment

1. Identifying the Problem

The first step is to identify the problem or research question to be answered. At this stage the researcher needs to formulate the problem clearly so that the research objectives can be achieved effectively.

2. Literature Search After the problem is identified,

The next step is to search for relevant literature. This search is carried out through various sources, including scientific databases, scientific journals, books, and other reliable sources related to the research topic.

3. Screening and Relevance of Literature Based on Quality Assessment

Next, the collected literature was screened to ensure its quality and relevance. This quality assessment is important to ensure that only high-quality and relevant research is used in this review.

4. Data Extraction and Progress Monitoring Data Synthesis

Extract the screened data to extract important information to support your research. Progress monitoring will be carried out to ensure the data extraction goes as planned and the research objectives are achieved.

By going through these steps, we are confident that this study will make a significant contribution to understanding and addressing the challenges of public administra-

tion in the VUCA era, and will provide effective strategies to improve the capacity of public organizations to deal with the dynamics of change.

3 Finding and Discussion

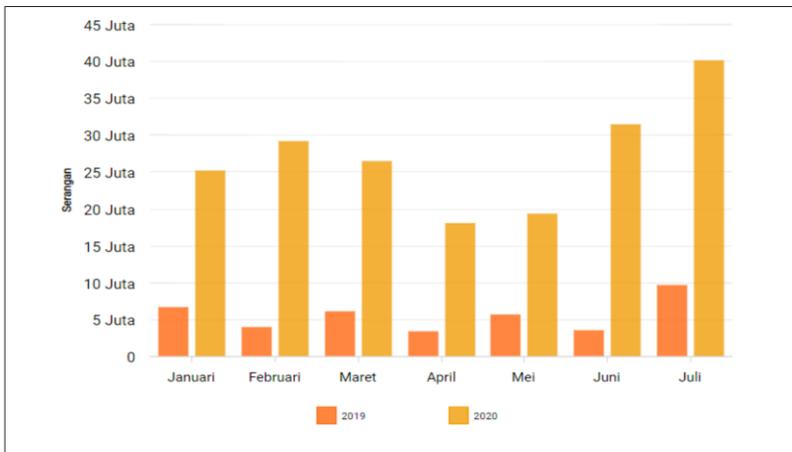
To face the VUCA era, institutional strengthening is important to ensure effective and responsive public services. Strong institutions must be transparent, accountable and inclusive, so that they can increase public trust and the level of community participation. Institutional strengthening includes strengthening institutional capacity [4]. Institutional strengthening and innovation in public services are key to facing the challenges of the VUCA era and achieving the SDGs targets. By integrating the principles of the SDGs, governments can develop innovative strategies to manage complexity.

This can support the establishment of a more peaceful, just and inclusive society, and ensure that public services can meet the needs and expectations of the people. Governance failure can delay the achievement of the SDGs substantially. Where such failure can be linked to insufficient public administration quality, or governance frameworks which are not optimized for the context and the problem types, this can, in principle, be prevented [9].

However, in Indonesia, obstacles in the implementation of e-government are still evident in several aspects, including limited regulations as a legal umbrella, limited competent experts in the field of informatics engineering, unintegrated data between government agencies due to different data formats, inadequate budgets, no infrastructure standards and minimal levels of information security. Most information systems developed by the government in Indonesia do not pay attention to interoperability aspects.

The majority of information systems developed by government agencies can only provide benefits locally, especially for the work unit that owns the budget for developing the information system. As a result, the basic information in an information system is often redundant to other information systems and is not synchronized. Another result is the difficulty of exchanging data, which must go through a long and time-consuming process of copying and adjusting data. This makes government information systems in Indonesia look like islands of scattered information systems that are not integrated. The escalation of cyber attacks in Indonesia has increased, especially since the Covid-19 pandemic, which became a turning point for the global community in the use of internet technology. Cyber threats are actual threats faced in the midst of current conditions that are volatile (volatility), full of uncertainty, complexity and ambiguity (Pertahanan et al., 2023). More details on the comparison of the number of cyber crimes in Indonesia before and after the Covid-19 pandemic.

Fig. 3. Comparison Chart of the Number of Cyber Crimes in Indonesia Before and After the Pandemic in 2019 - 2020



Source: (BSSN, 2020)

In general, it appears that Indonesia's use of cyberspace is high with 24TBps of international traffic and 6TBps of domestic traffic. With infrastructure in the form of 11 satellites, 566,006 BTS towers, 344,007 km of optical fiber and 204.7 million internet users and 370.1 million smartphones. Along with the increase in internet usage, it is of course possible that there will be an increasing number of cybercrime and data leakage cases in Indonesia.

Based on data from the National Cyber Security Operations Center (Pusopkamsinas) of the National Cyber and Crypto Agency (BSSN), as shown in the graph in Figure 4, in the period January - December 2021 Indonesia recorded a total of 1,652,521,839 traffic anomalies or cyber attacks. In addition, there were 19,529 complaints related to negative content that had been taken down by BSSN (Pusopkamsinas BSSN, 2021). The types of cyber threats can be physical and non-physical (narrative), while the sources of cyber attacks can be categorized as coming from State Actors, non-State Actors and State Proxies (Tim Maurer, 2015).

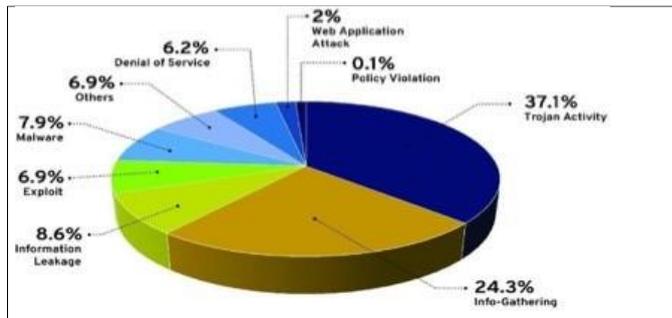
During the period 2019-2022 Indonesia experienced several incidents with a fairly massive number including data leaks at the KPU, Ministry of Education and Culture, e- Hac, Ministry of Health, BPJS Health, Police and Bank Indonesia. In addition, hacking also occurred on the DPR, TNI AD and BSSN websites. In fact, recently there was a cyber incident that shocked the public and was carried out by a hacker using the identity Bjorka, who throughout 2022 had carried out a series of hacks on Tokopedia, Wattpad, Indihome, KPU, and the most crushing was his claim to have successfully hacked 1.3 billion SIM Card registration data from the Ministry of Communication and Information, not stopping there Bjorka also claimed to have hacked the President's secret letter data and BIN as well as some personal data of figures.

In addition to data leakage cases, cyber incidents also occurred in the national vital infrastructure sector including sabotage issues and alleged cyber attacks that occurred at the State Electricity Company (PLN) installation in August 2019 resulting in an estimated loss of 90M rupiah (suara.com, 2019). Specifically, the most common categories of cyber attacks are malware, trojan activity and information gathering (gathering information to obtain system vulnerabilities) or data theft (BSSN, 2021).

From the anomalies detected and reports received by the BSSN National Center for Cybersecurity during January - September 2022, there were 861,070,178 traffic anomalies, and there were 1,293 cybersecurity notifications that BSSN had sent to affected stakeholders (BSSN, 2022). Of the total notifications, 73 notifications or only about 6% have been responded to by affected stakeholders. The most common type of incident is web defacement incidents in the government sector. Meanwhile, looking at the number of cyber attacks in the first semester of 2020 to the first semester of 2021, the majority of attacks were aimed at state-owned banks, namely 71.6%, then private banks 28%, and as much as 0.3% were aimed at foreign banks. In addition, BSSN also reported that the sector that experienced the most cases of data leakage was the government sector (45.5 percent).

From the data that has been submitted, it can be seen that the response from related agencies is still quite low in anticipating cyber attacks. If this continues to happen and cannot be anticipated properly, it is not impossible that it can escalate into a threat that can endanger the survival of the community and even the state, for example: (1) banking disruptions escalate into paralysis of economic transactions, (2) electricity disruptions escalate into economic and transportation disruptions, (3) health sector disruptions cause health service disruptions, (4) defense sector disruptions cause threats to state sovereignty and so on. Furthermore, the author also observed that some technical cyberattacks that occurred in Indonesia include airline passenger data leaks, e-commerce user data leaks, and fintech user data leaks that are traded on dark web sites.

According to the National Cyber Security Operations Center, BSSN RI from January to December 2020, there were at least 495,337,202 attacks. This number shows a significant increase in technical cyber attacks compared to similar attacks throughout 2019 which were recorded at 182,034,863. Specifically, throughout 2020 there were 183,775,191 cases of Trojan Activity, 120,465,342 cases of Info Gathering, 42,542,523 cases of Information Leakage, 34,123,247 cases of Exploit category, 38,824,886 cases of Malware, 34,259,279 cases of Other, 30,587,650 cases of Denial of Service, 10,207,533 cases of Web Application Attack, 551,551 cases of Policy Violation and several other cases of attack.

Fig. 4. Technical Cyber Attack Data in the January – December 2020 Period

Source: (BSSN RI, 2022)

Based on this explanation, of course cybersecurity in the VUCA ERA proves to be a vital domain to be managed and regulated both with the current public administration approach and a combination with various paradigms so as to realize national goals in the digital era. In addition, the formulation and implementation of national strategies related to the cyber domain are key to the success of a country to be able to defend, fight for and advance all national interests in the VUCA ERA as well as to achieve the 16th SDGs target of peace, justice and resilient institutions.

Improving national cybersecurity is an important step in ensuring high-quality and reliable public services in the digital era. For public services, strong cybersecurity protects personal data and sensitive information from cyber threats such as hacking and malware that can lead to data breaches and service operational disruptions. By strengthening cybersecurity, governments can prevent service disruptions that can negatively impact public trust in public institutions. The building of social awareness and expertise in cybersecurity is to be achieved, as set out in the strategy, by creating and implementing such a model of university education and professional improvement as will guarantee employee qualifications commensurate with the challenges [10].

Measures such as upgrading technology infrastructure, providing cybersecurity training for employees, and developing policies that adapt to the latest cyber threats are key to delivering effective and secure public services. In addition, improving national cybersecurity is directly related to achieving the Sustainable Development Goals, particularly point 16, which emphasizes peace, justice and strong institutions. Strong cybersecurity reduces the likelihood of conflict due to cyberattacks on critical infrastructure and supports a peaceful environment [4].

The effective management of cybersecurity has become a paramount concern for public administration entities [11]. In addition, effective cybersecurity systems promote justice by ensuring equitable access to public services without discrimination. Furthermore, implementing good cybersecurity practices builds resilient organizations so that government agencies and other organizations can operate efficiently and trans-

parently. Therefore, investments in cybersecurity not only protect data and services, but also support broader sustainable development.

In this regard, the RI National Cybersecurity Strategy (NSCS) should: (1) always be the starting point and not the end point of a dynamic and continuous series of efforts; (2) be the best that can be formulated and implemented in the present to create the desired future conditions; (3) and is an effort to influence and engineer the internal and external conditions of the Indonesian nation in order to achieve the expected national goals.

Thus, as efforts to achieve national cybersecurity do not exist in a vacuum, BSSN RI is obliged and sensitive to always analyze, sharpen, and engineer BSSN RI's internal and external strategic environment, which may be a factor that can directly influence the Indonesian nation's efforts to achieve its national goals in cyberspace. In other words, BSSN RI is not about a promising future, but rather the ability of the Indonesian people today to take the right actions to achieve the expected national goals in the future.

4 Conclusion

In the face of increasing volatility, uncertainty, complexity and ambiguity, public administration must adapt and innovate to remain relevant and effective. Institutional resilience, policy adaptability and inclusive public participation are key elements to address these challenges. In addition, strengthening cybersecurity and the appropriate application of digital technologies are critical to maintaining the integrity and smooth running of public services. Moving towards a peaceful and inclusive society requires a holistic approach that covers social, technical and institutional aspects.

The government should focus on improving organizational capabilities through continuous training, digital upskilling, and the application of new technologies. Investment in technology and cybersecurity infrastructure should also be prioritized to protect public data and services from cyber threats. Policy makers need to develop flexible and adaptable frameworks that can respond to rapid changes in a VUCA environment. This includes policies that support innovation, cross-sector collaboration and public participation in decision-making.

Increased community participation is needed in the public management process so that it becomes a priority to ensure that the policies and services produced reflect the needs and desires of all levels of society. A high level of risk management is needed to face the VUCA era which is expected to improve governance and synergy between government organizations, both central and local governments because that way all the challenges of public administration in the current VUCA era can be faced.

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