

# Stages of Human Resource Planning for National Cyber and Crypto Agency to Support Defense

Riri Andani<sup>1)</sup>, Yusuf Ali<sup>2)</sup>, Frega Ferdinand Wenas Inkiriwang<sup>3)</sup>

<sup>1)</sup>Defense Management, The Republic of Indonesia Defense University, Indonesia.

<sup>2)</sup>Lecture of Defense Management, Defense University Indonesia, Indonesia.

<sup>3)</sup>Lecture of Defense Management, Defense University Indonesia, Indonesia.

**Abstract:** Increasingly sophisticated technology, information and communication provide convenience for its users, but behind the convenience provided by this technology and communication it also has a negative impact, including the rise of cyber threats and attacks. The National Cyber Security Operations Center recorded as many as 423,244,053 attacks that occurred in Indonesia in 2020. To overcome these cyber attacks, professional human resources are needed. The formulation of the problem in this study focuses on how to plan human resources for the National Cyber and Crypto Agency to support national defense. This study uses a qualitative method with a descriptive analytical research design. The results showed that the National Cyber and Crypto Agency carried out data collection to determine the current condition of the results of the analysis carried out by each work unit including job analysis and workload analysis. The National Cyber and Crypto Agency has prepared a strategic plan in accordance with the Regulation of the National Cyber and Crypto Agency No. 5 of 2020 concerning the Strategic Plan of the National Cyber and Crypto Agency for 2020-2024, one of the agendas is to increase quality and competitive human resources.

**Keywords:** Human Resource Planning, Human Resource Planning Constraints, Cyber Threats

## I. INTRODUCTION

The development of a dynamic and increasingly advanced strategic environment makes the development of threats increasingly complex and multidimensional which is quoted from the 2015 Indonesian Defense White Paper, threats in the form of military threats, non-military threats and hybrid threats. The forms of these threats include terrorism and radicalism, separatism and armed rebellion, natural disasters, violation of border areas, piracy and theft of natural resources, disease outbreaks, cyber attacks and espionage, drug trafficking and abuse as well as open conflict or conventional war. According to Setiawan (2017), today's developments have led humans to the era of scientific and technological progress in a relatively short time, making technological developments very advanced and sophisticated. Due to the advancement of technology,

Based on the Cyber Security Monitoring Report (2019), there was a sharp increase in attacks from 2019 to 2020. In 2019, the number of cyber attacks that occurred from February to November amounted to 182,034,863 attacks. Meanwhile, in 2020, this attack increased by 232 percent, amounting to 423,244,053 attacks. The most common type of attack was trojan activity as much as 56% and then followed by information gathering activity (gathering information) as much as 43% of the total attacks, while the remaining 1% were web application attacks (National Cyber Security Operations Center, National Cyber and Crypto Agency, 2020).

The National Cyber and Crypto Agency (BSSN) was formed to deal with the threat of cyber crime and is tasked with implementing cyber security effectively and efficiently by utilizing, developing, and consolidating all elements related to cyber security. The National Cyber and Crypto Agency (BSSN) is a government agency of the Republic of Indonesia which is engaged in Information Security and Cyber Security. BSSN has full authority to ensure that the fulfillment process, both internal and external, is carried out as well as possible (Regulation of the National Cyber and Crypto Agency No. 5 of 2020 concerning the Strategic Plan of the State Cyber and Crypto Agency for 2020-2024).

The Head of Sub-Directorate for Vulnerability Identification and Electronic-Based Trading Risk Assessment of the National Cyber and Crypto Agency (BSSN), Intan Rahayu I revealed that Indonesia needs tens of thousands of human resources who are skilled in cybersecurity. Currently, Indonesia needs around 18,054 human resources in the field of

Cyber Security in dealing with cyber threats. With the need for human resources, it is necessary to do what is called human resource planning.

Human resources are a potential source of competitive advantage because their competencies in the form of intellect, nature, skills, personal character, as well as intellectual and cognitive processes, cannot be imitated by other organizations. Therefore, organizations are required to carry out continuous development of the quantity and quality of human resource knowledge through training for HR or stimulating human resources so that they are always "learning by doing" in accordance with the learning organization. To be able to develop the human resources owned by the organization is very dependent on the organizational processes to produce competent human resources and the company's ability to recruit the best individuals.

From the various problems that have been described above, researchers are interested in analyzing the HR planning system of the National Cyber and Crypto Agency. Therefore, the formulation of the problem proposed to answer the problem of this research is How is the HR planning system of the National Cyber and Crypto Agency.

This study uses the HR Planning theory according to Schuler (1987) which is derived into stages in the HR Planning process as the basis for analyzing the implementation of HR Planning at the National Cyber and Crypto Agency, which is studied from a systems perspective. Referring to Schuler's (1987) opinion, it can be concluded that there are four important stages in the HR planning process, namely: 1) Gathering, Analyzing, and Forecasting Supply and Demand Data, 2) Establishing Human Resource Objectives and Policies, 3) Human Resource Programming, and 4) Human Resource-Planning-Control and Evaluation (Hayati, 2014).

The first stage, Gathering, Analyzing, and Forecasting Supply and Demand Data. At this stage, a number of activities are carried out to collect, investigate, analyze, and predict data needs to determine supply and demand. Sources of data can come from the internal or external environment, which is explored based on past experiences, observations in the present, and predictions of future needs.

The second stage, Establishing Human Resource Objectives and Policies. Determination of HR objectives and policies must be based on clear corporate objectives and policies, in order to anticipate organizational development in response to global changes. The main objective of setting policies in HR planning is to design the need for the number and qualifications of employees who are reliable and have professional competence to support the achievement of corporate goals.

The third stage, Human Resource Programming. At this stage, HR management mechanisms and procedures are designed that can be implemented properly, especially in order to increase bargaining power for the recruitment of qualified candidates. Its activities include the preparation of programs related to the following: new employee procurement programs (starting from the recruitment, selection, induction, or orientation process to placement), to maintenance (care) for productive employees.

The fourth stage, Human Resource-Planning-Control and Evaluation. At this stage, the activities are more focused on monitoring and evaluating the implementation of ongoing HR management programs so that they remain on the right track (on the right track). Based on the evaluation results, it can be seen the objective conditions of the organization's SD, which are then used as feedback to revise policies or take action to adjust interests in accordance with causal analysis. In addition, the results of the evaluation can be used as a basis for feedforward, especially for preparing further plans in the future.

## **II. METHOD**

In this study using descriptive analytic. The aim is to produce research reports that provide comprehensive and analytical explanations. Discussion and research results are in the form of critical studies or analysis. Then the approach used in this research is a qualitative approach. In addition, data collection methods from interviews and documentation. The informants were selected purposively, because the selected informants were credible informants and the informants were considered the most knowledgeable about what the researchers expected and provided the data needed by the researchers. After the data is obtained, data analysis is carried out. Qualitative data analysis was carried out through the flow according to Miles and Huberman (2014), namely data condensation, data presentation and drawing conclusions or verification. Furthermore, a study will not be transferable if it is not credible, credible or not the research can be proven by using a data validity check, this is done so that the research results can be accounted for both practically and scientifically. To determine the validity of the data (trustworthiness) of the data, an examination technique is needed. The technique of checking the validity of the data in qualitative research is done through triangulation. The triangulation chosen is source triangulation, namely comparing one's perspective with the opinions and views of others, and comparing the results of interviews with documents. this is done so that research results can be accounted for both practically and scientifically. To determine the validity of the data (trustworthiness) of the data, an examination technique is needed. The technique of checking the validity of the data in qualitative

research is done through triangulation. The triangulation chosen is source triangulation, namely comparing one's perspective with the opinions and views of others, and comparing the results of interviews with documents. this is done so that research results can be accounted for both practically and scientifically. To determine the validity of the data (trustworthiness) of the data, an examination technique is needed. The technique of checking the validity of the data in qualitative research is done through triangulation. The triangulation chosen is source triangulation, namely comparing one's perspective with the opinions and views of others, and comparing the results of interviews with documents.

### **III. RESULTS AND DISCUSSION**

As explained in the theoretical review, the PNS HR planning system consists of interrelated components, which can be derived into steps or stages in the HR planning process by collecting, analyzing and predicting data needs to determine employee supply and demand; establish HR objectives and policies; carry out the preparation of manpower programs; and control and evaluate HR planning. In connection with the concept of PNS HR Planning based on national policies and regional authorities in the implementation of HR Planning, the researchers conducted information excavation based on a theoretical review of the National Cyber and Crypto Agency's HR Planning mechanism which can be explained as follows.

#### **3.1 Gathering, Analyzing, and Forecasting Supply and Demand Data**

Researchers interpret data related to the Gathering, Analyzing, and Forecasting Supply and Demand Data stages in human resource planning implemented by the National Cyber and Crypto Agency consisting of collecting, analyzing, and predicting data needs.

In collecting data, the National Cyber and Crypto Agency is carried out at the end of each year by each work unit and the results are given to the Bureau of Human Resources Organization. In accordance with Law Number 5 of 2014 concerning State Civil Apparatus and Government Regulation Number 11 of 2017 concerning Management of Civil Servants, as well as Government Regulation Number 49 of 2018 concerning Management of Government Employees with Work Agreements, government agencies are required to compile the number and types of PNS and PPPK positions for 5 years which is broken down annually based on priority needs.

In fulfilling the human resource needs, the State Cyber and Crypto Agency first has input from the State Cyber and Cryptotechnics which has around 100 graduates each year and these graduates are drawn directly by the National Cyber and Crypto Agency and make these graduates State Civil Apparatus Employees (ASN). Second, through the selection of Civil Servant Candidates (CPNS), which in recruitment starts from submission to the KemenPan-RB and BKN which is approved by the Kemen Pan-RB and the recruitment and selection is carried out by the BKN which consists of the selection of CPNS and PPPK.

The analysis is carried out based on Law Number 5 of 2014 Article 56, namely that every Government Agency is obliged to prepare the needs for the number and types of PNS positions based on job analysis and workload analysis. From the results of job analysis and workload analysis, it is possible to compile a job map, job description and number of employee needs by taking into account current conditions and needs.

The results of the analysis can predict the human resource needs of the National Cyber and Crypto Agency. The Cyber and Crypto Agency also cooperates with related Ministries/Institutions/Regions to secure cyberspace. The National Cyber and Crypto Agency has predicted that human resources will be around 18,054 people. Based on data from the National Cyber and Crypto Agency, there are currently 9804 job opportunities in the Indonesian cybersecurity industry. Meanwhile, there are 650 state administration agencies and 1000 public service providers. So it can be assumed that if each agency requires 5 cybersecurity managers, the total required human resources is 18,054 people.

#### **3.2 Establishing Human Resource Objectives and Policies**

In this case, the National Cyber and Crypto Agency has drawn up a Strategic Plan, namely the State Cyber and Crypto Agency's Strategic Plan for 2020-2024 which has the potential to develop professional human resources in the field of cyber security and has full authority.

to ensure the process of fulfilling HR both internally and externally. Then, the strategic plan becomes the reference for the National Cyber and Crypto Agency, in this case the Bureau of Human Resources Organization to develop programs and activities that support the vision and mission of the National Cyber and Crypto Agency. This is in determining HR objectives and policies that refer to the strategic plan which also aims to design the number and qualifications of employees according to needs.

In 2019, the National Cyber and Crypto Agency published an Occupational Map in the Cyber Security Sector (PONKS). The occupational map is a mapping of the needs and competencies of National Cyber HR needed to support reliable and strong cyber security so as to support national defense.

Referring to the Law No. 5 of 2014 concerning the State Civil Apparatus in compiling the need for the number and types of PNS positions based on job analysis and workload analysis. Position Analysis aims to find out information on positions such as duties, authorities, and responsibilities of the position. After the job analysis has been carried out, the next step is to carry out a workload analysis aimed at finding out what it is like, when it is done, and when it is effective. With clear objectives and policies, the National Cyber and Crypto Agency can follow up on the HR planning of the National Cyber and Crypto Agency.

### **3.3 Human Resource Programming**

After developing policies, the next step is to plan HR management mechanisms and procedures that can be implemented, especially in the context of increasing bargaining power for qualified prospective employees. In accordance with the research context, after analyzing HR needs, the next step is to recruit and procure HR.

In terms of recruitment and procurement of human resources itself is carried out by the State Civil Service Agency which is selected through the acceptance of Candidates for State Civil Apparatus which includes CPNS, and PPPK. Starting from the announcement of vacancies available in each agency, then for applicants to register with the requirements that have been attached to each agency. After registration is closed, BKN will carry out administrative selection. And for applicants who do not pass the administration, they can still rebut the results of the administration. For applicants who are declared to have passed the administration, a Basic Competency Selection (SKD) test will be carried out with the threshold value issued by BKN. And after the implementation of the SKD, the next is the Field Competency Selection (SKB) exam. Where applicants who pass the SKD exam are selected by ranking. After completing the SKB exam, an announcement will be issued for applicants who have passed. After being declared graduated, the applicant has not been declared one hundred percent directly into ASN where in one year they are still on a probationary period which will be given debriefing, introduced to sub-organizations, participate in basic CPNS training. After that, they were declared graduated and appointed as civil servants.

For Ministries/L/Regions, the National Cyber and Crypto Agency conducts training for employees who actually work in the field of cybersecurity. The preparation of the Human Resources Development Program and Capacity Building for the National Cyber and Crypto Agency is carried out through structural training, functional training, and technical training.

The National Cyber and Crypto Agency has compiled an Occupational Map which aims to provide clarity to the workforce, academia, and industry regarding the definition of duties, competencies, authorities and careers in cybersecurity.

### **3.4 Human Resource-Planning-Control and Evaluation**

In human resource planning, it is necessary to implement control and evaluation. Where these activities are very influential on the ongoing programs which are to stay on track that has been previously planned. The results of the control and evaluation can also be useful as input for revising policies and making adjustments. The National Cyber and Crypto Agency in the implementation of control and evaluation includes activities such as HR procurement, performance appraisal, code of ethics, discipline, and development in a position. In evaluating the performance of employees, the National Cyber and Crypto Agency applies it twice a year.

In human resource planning, control and evaluation are carried out by each work unit in the National Cyber and Crypto Agency.

## **IV. CONCLUSION**

The National Cyber and Crypto Agency has implemented human resource planning and understands the importance of implementing human resource planning to ensure the achievement of objectives, which are carried out based on the following stages of human resource planning:

- a. At the Gathering, Analyzing, and Forecasting Supply and Demand Data stage, the National Cyber and Crypto Agency carries out data collection to determine the current condition of the results of the analysis carried out by each work unit including job analysis and workload analysis. The results of the analysis can predict the needs of supply and demand.
- b. At the stage of Establishing Human Resource Objectives and Policies, the National Cyber and Crypto Agency has prepared a strategic plan in accordance with the Regulation of the National Cyber and Crypto Agency No. 5 of 2020 concerning the Strategic Plan of the National Cyber and Crypto Agency for 2020-2024, one of the agendas is to increase quality and competitive human resources.

- c. At the Human Resource Programming stage, in accordance with the research context, after analyzing employee needs, the next step is to recruit and procure employees. The National Cyber and Crypto Agency proposes the number of employee needs to the KemenPAN-RB and BKN. In terms of recruitment to procurement carried out by BKN.
- d. At the stage of Human Resource Planning Control and Evaluation. The control and evaluation stages in HR planning at the National Cyber and Crypto Agency lead to employee performance, such as employee discipline, code of ethics, development in a position, achievement of performance achieved.

## REFERENCES

- [1] Widajanti, Erni. 2007. Perencanaan Sumber Daya Manusia Yang Efektif: Strategi Mencapai Keunggulan Kompetitif. *Jurnal Ekonomi dan Kewirausahaan* Vol. 7, No. 2, Oktober 2007: 105-114.
- [2] Setiawan, W. (2017). Era Digital dan Tantangannya. *Seminar Nasional Pendidikan 2017*, 1-9.
- [3] Hayati, D. I. 2014. Perencanaan Sumber Data Manusia Aparatur: Studi Deskriptif tentang Sistem Perencanaan SDM Pegawai negeri Sipil di Kabupaten Kediri. *Jurnal Kebijakan dan Manajemen Publik* Vol. 2, No. 1, Januari 2014.
- [4] P.O. Bishop, Neurophysiology of binocular vision, in J. Houseman (Ed.), *Handbook of physiology*, 4 (New York: Springer-Verlag, 1970) 342-366.
- [5] D.S. Chan, *Theory and implementation of multidimensional discrete systems for signal processing*, doctoral diss., Massachusetts Institute of Technology, Cambridge, MA, 1978.
- [6] Laporan Tahunan Jan-Des 2019. Pusat Operasi Keamanan Siber Nasional Badan Dan Sandi Negara. Indonesia Siber Security Monitoring Report 2019.
- [7] Badan Siber dan Sandi Negara. (2020-2024). *Rencana Strategis Badan Siber dan Sandi Negara*. Jakarta: BSSN.
- [8] Kementerian Pertahanan Republik Indonesia. (2015). *Buku Putih Pertahanan Indonesia*. Jakarta.
- [9] Miles, M. B., Huberman, A. M., dan Saldana, J. (2014). *Qualitative Data Analysis, A. Methods Sourcebook*, Edition 3. USA: Sage Publications.