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THE EFFECTIVENESS OF THE WORK OF PT PERKEBUNAN NUSANTARA V IN THE APPLICATIONOF GEOSPATIAL TECHNOLOGY (CASE STUDY OF PTPN SEI PAGAR UNIT)

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Abstract

Work effectiveness shows the ability of a company to achieve the targets that have been set correctly. The achievement of the targets that have been set based on the applicable size and standards reflects that a company has paid attention to its operational effectiveness. As a large company in its field, PTPN V realizes itsposition is in high competition in the industrial era 4.o. For this reason, PTPN V began to use information technology in the form of drones to assist companies in managing their oil palm and rubber lands. This study aims to determine the effectiveness of the work of PT Perkebunan Nusantar V Pekanbaru in the application of information technology as a form of company awareness of technological developments and to be able to follow the flow and be able to compete in the industrial revolution era 4.o. This type of research is a qualitative research using a descriptive approach and the data needed are primary data and secondary data obtained from observations, interviews, and documentation analyzed by researchers so that they get accurate and clear data regarding the work effectiveness of PT Perkebunan Nusantara V Pekanbaru in the application of information technology in the form of drones that function to calculate the number of principal plants, detect geographical conditions of land, check plant health, and of course take pictures of oil palm fields. The effectiveness of PTPN V's work in the application of drones is assessed through indicators of work quality, quantity of work, and time utilization, in which the company experiences effective and significant results despite several inhibiting factors such as weather and drone motors.

INTRODCUTION

Every aspect of life will certainly be faced with various changes. Change occurs because the environment is dynamic so that it requires humans to be able to adapt in order to survive. The most obvious change today is in technology. Technology has touched almost all walks of life, including the economic sector, especially companies.

For some people, information is something they don't know or have and can be used in the solution of a problem. Data can often be more basic that refers to numbers, people or things. In this sense, data becomes information when it is accessed by people who need it and can enforce it in problem solving. When data and information are organized, systematic and integrated, we refer to it as an information system. According to Mc Leod (2001), information is data that has been processed, or data that has meaning. Information is an important part of a company. Sutabri (2005) suggests that information is data that has been classified or processed or interpreted for use in decision making. Meanwhile, Bodnar (2005) argues that information is data that is processed so that it can be used as a basis for making the right decisions.

The urgency of information and information systems is inseparable. Therefore, the resources in the office must be able to process and manage information properly through the development of a good information system for the office. Because this office information system will make it easier for every employee in carrying out their work. With access and ease of work, it will also bring benefits to the organization. Information systems have now become a very vital role for an office. Because along with the rapid development of information and communication technology, the information system becomes a measure of the strength of the flow of information needed by the office. So that the office in this case the management will not hesitate to make the information system a long-term investment because of the many positive impacts or benefits generated by the information system, and the usefulness of the information system which greatly helps the work of the employees in the office.

For every organization, both government and private organizations, information systems become an absolute necessity, because all organizational activities basically require information. Information is a resource or organizational resource that is absolutely needed by every type of organization to support the entire managerial process in order to achieve predetermined organizational goals. Information becomes a very important part to support administrative work processes and the implementation of management functions in the face of rapidly changing situations and conditions. The consequences of this require every organization, both business organizations and government organizations to manage information systematically.

In companies, information technology is used to increase work effectiveness and productivity. The demand to continue to produce and improve the quality of quality

products continues to press amid dynamic environmental changes and unavoidable consumer needs. This encourages companies to continue to innovate in their performance, one of which is the use of information technology.

The use of information technology makes it possible to complete tasks accurately, accurately, and efficiently. Information technology has influenced humans in their activities and organizations, ranging from communicating, how to produce, how to coordinate, how to think, how to make decisions, and much more.

Information technology is one type of technology in the form of technical equipment and functions to process and convey information. Information technology includes a series of equipment that functions as a tool to process data or information, tools, manipulation tools, and information management tools. The rapidly developing information technology is characterized by increasingly sophisticated technological equipment and a very broad scope.

In principle, the use of information technology in a company or organization is adjusted only to the needs of the company, it does not have to always use the latest technology if the previously existing technology can still meet the company's needs for information. If it is needed, it needs to be considered because the use of information technology is also intended to reduce production costs and help develop company competencies.

In the product service process which is dominated by humans, the relationship between systems within the organization which is a prerequisite for achieving an effective organization directly requires better human resource management capabilities. A dynamic company will always increase its productivity through consistently producing the best performance and maintaining that competitive advantage.

However, the application of information technology in companies cannot be separated from the support of competent employees' abilities in applying the technology. Because after all, the main component in the company's operations is still its human resources. They are the ones who will later operate the information technology to function properly.

Human resources are a valuable asset for the company. Human resources include people within the company who have different roles and functions. How well human resources are managed will determine the company's success in achieving its targets. No matter how sophisticated and complete the facilities provided by the company are, if the human resources are inadequate and not managed properly, it is likely that the company will not be able to achieve its goals.

PT Perkebunan Nusantara V (PTPN V) is a former State-Owned Enterprise (BUMN) which is engaged in oil palm and rubber plantations. PTPN V is headquartered in Pekanbaru with a work location in Riau Province, where 90% of the Indonesian

government's shares in PTPN V were transferred to PTPN III and made PTPN III a Plantation BUMN holding. PTPN V, hereinafter referred to as the “Company”, was originally a BUMN which was established based on Government Regulation (PP) of the Republic of Indonesia No. 10 of 1996 dated February 14, 1996 concerning the Capital Deposit of the Republic of Indonesia for the establishment of a company. Initially, it was a consolidation of plantation development projects for former PT Perkebunan (PTP) II, PTP IV and PTP V in Riau Province.

The company as of December 2014 had palm kernel plantations with a total planted area of 78,340.09 ha with the composition of Mature Plants (TM) covering an area of 57,419.60 ha, Immature Plants (TBM) covering an area of 17,540.09 ha, TB/TU/TK covering an area of 2,736 , the seedling area is 127.40 ha and the non-productive area is 517 ha. The company also has a core rubber plantation with a total area of 8,184 ha with a composition of 5,215 ha of TM, 2,898 ha of TBM, 68 ha of TB/TU/TK and 3 ha of seedlings. The company in managing the vast land certainly requires human resources to produce production for the company. Human resources in question are employees because employees are the main driver of the course of activities and as a determinant of achieving company goals.

Efforts to increase the production of plantation products certainly cannot be separated from the best use of the resources owned by the company. Companies are required to prioritize the handling of improving the quality of their resources, including human resources. Human resources are the main driver of an organization or company. Employees who are active, innovative, creative, participatory and have loyalty to the company and support the achievement of company goals are very much needed in strengthening the company's competitiveness in an industry that continues to experience growth. Employment issues are very important in the management of a plantation. Employees work in the company to complete various tasks according to their position or title. To achieve this goal, employees are required to give the best for the company. Employees who work well are expected to improve the company's overall performance, which in turn brings prosperity together (Istijanto, 2006). Employees are company assets that are very useful for the interests of management in carrying out the operations and activities of the company. Employees who have a high level of job involvement are very impartial and genuinely care about the field of work they do. Employees as human resources must be considered in various aspects because without the presence of human resources it is impossible for the company's wheels to run smoothly.

PTPN V has used information technology resources to support the company's business achievements. PTPN V realizes the company's position in high competition in the industrial era 4.0. For this reason, the company's strategy in carrying out digital

transformation is carried out systematically, gradually and consistently by implementing digitalization to increase oil palm production, namely by applying geospatial mapping for the management of oil palm plasma plantations using unmanned aircraft or drones. Geospatial mapping is an aerial mapping method from drones. Through this information technology, plasma farmers will receive a variety of information ranging from planted area, precise number of trees, contour maps, ditch or river maps, including the health level of the plants.

Unmanned aircraft or unmanned aircraft (Unmanned Aerial Vehicle abbreviated UAV) or often called a drone is a flying machine that functions with remote control by the pilot. It was first created on August 22, 1849, although with technology appropriate to that era. The use of radio control in pilotless aircraft was first developed in England in 1931, namely by the Fairey Queen radio control derived from the Fairey IIIF.

Drones have developed quite rapidly, especially in the field of technology from year to year. This unmanned aircraft is very useful in various events that occurred in ancient times, one of which was when the 1st world war broke out. Initially this drone was only used in America, but gradually drones began to be used in several other countries such as Indonesia. The history of drones in Indonesia began in 2000, but the development at that time was not good because it was not carried out by one agency. Then over time, an association was formed involving several professional bodies in Indonesia whose task was to develop the function of the unmanned aircraft.

With the increasing use of drones in various jobs, the Ministry of Transportation made Law no. 90/2015 on controlling the operation of unmanned aircraft in the airspace served by Indonesia. This law was just promulgated on May 12, 2015, the contents of which include prohibiting the operation of drones in restricted air areas, in restricted air areas, and in the safety area for flight operations of an airport. Drones are also prohibited from flying more than 500 feet or 150 m.

Now drones have also been used in agriculture, namely to help farmers work in increasing agricultural yields by surveying crops and seeing which areas need more attention. With drones, the work will be more accurate and much faster than walking across a farm.

Agricultural/agricultural drones are unmanned aerial vehicles applied to agriculture to help increase crop production and monitor crop growth. Sensors and digital imaging capabilities can give farmers a richer image of their field. This information may prove useful in increasing crop yields and agricultural efficiency. This bird's eye view can reveal many problems such as irrigation problems, soil variations, and pest and fungal attack. The multispectral image shows a near-infrared view as well as a visual spectrum view. The combination shows farmers the difference between healthy and unhealthy crops, thus this view can be helpful in assessing crop growth and

production.

In addition, drones can survey crops for farmers at regular intervals as desired. Weekly, daily, or even hourly images, can show changes to the crop over time. Some of the benefits of drones in agricultural technology include as a plant growth monitoring system, assessing soil conditions, irrigation and drainage systems, monitoring livestock, optimizing plant populations on land, and so on.

The drone used by the company is a drone with a clutch lever. Before using drone technology, farmers check manually so it takes a long time. By using drones, the company can shorten the time, where the distance that the drone can reach reaches 1000 kilometers with an area that can be taken up to 400 ha. This activity only takes 1 hour, which includes the activities of calculating the principal amount, detecting plant health through leaf color, and detecting the topography of the area.

When the company was still using the manual method, the farmers counted the number of trees in the field themselves, so sometimes there was a human error in the form of uncounted trees because the farmers did not find the place where the tree was located. By using a drone, the number of trees detected is more accurate because the drone is operated using a predetermined layout, so the drone will work automatically to record the state of the oil palm plantation. Through the use of this drone, the company can save on fertilizer use, because of the way drones work where the drone will only count all plants recorded within the radius that has been set on the drone automatically so that if there are trees that are not included in that radius or the tree is still too small, then the tree is too small the subject will not be counted.

Tabel 1.1 Fertilizer Usage Data in 2020

Description	**RKAP**	**Principal Amount According To GIS**	**Difference +/-**	**S/D MEI**
Physique (Kg)	76,307,167	75,055,730	1,251,438	291,044
Cost (Rp)	333,440,023,650	327,971,607,262	5,468,416,388	1,271,776,795
Number of trees	8,366,488	8,229,278	137,210	31,911

Source : PT. Perkebunan Nusantara V Pekanbaru

The use of this drone is only done once a year. The obstacle in using drones is that drones cannot be flown when it rains or when the wind is strong at a speed of ± 10 m/s so that if it's time to use a drone but the weather is not good then the activity must be

postponed. Drones are controlled using a remote.

President Director of PTPN V, Jatmiko Santosa said that the management of the company's plasma plantations in the future cannot only focus on rejuvenation and increasing production but also through increasing the use of the latest and most effective information technology. PTPN V's production activities have reached 14-16 tons of FFB per year.

Based on the achievements in producing palm oil above, it can be seen that PTPN V has succeeded in becoming a large and successful company in terms of production by utilizing information technology in the form of geospatial mapping. However, the question is how effective the work at PTPN V actually is. Considering the achievement of high productivity, of course, it cannot be separated from the effectiveness of the way workers do their work in producing palm oil. From the description in the introduction section, the problem in this research is formulated in the research title, namely "Work Effectiveness of PT Perkebunan Nusantara V in the Application of Geospatial Technology (Case Study of PTPN Sei Pagar Unit)."

RESEARCH METHODS

This research was conducted using qualitative research with a case study approach, which is descriptive analysis. The case study approach is a qualitative approach in which the researcher explores real life, contemporary limited systems or various limited systems, through detailed and in-depth data collection involving multiple sources of information or multiple sources (eg observations, interviews, audiovisual materials, documents and reports). Description analysis is a method in examining the status of a group of people, a set of conditions, attitudes and views on a phenomenon that occurs in society and tells the data according to the current situation.

Data analysis in this study begins with collecting data from observations, interviews, and documentation. The data obtained is the material for researchers to process and analyze. The types of data used in this study are primary data and secondary data. Primary data is data obtained directly from informants at the research location who are the subject of research by researchers, in the form of information that is relevant to the problems that have been formulated in the research, while secondary data is processed data or second source data obtained from previous research reports, journals, books, internet, mass media, and other sources that are relevant to the research as support for the completeness of this research.

This research was conducted in the city of Pekanbaru with the locus of PT Perkebunan Nusantara V Pekanbaru which is one of the State-Owned Enterprises engaged in oil palm and rubber plantations. The reason for choosing the research location is because PTPN V is considered a company that has been successful in terms of

production that wants to improve it by utilizing information technology to keep up with the times.

RESULT AND DISCUSSION

Work effectiveness is a state of perfect work success in accordance with a predetermined plan. In order to guarantee a business success in increasing the effectiveness of employees' work in an organization, it is necessary to have the influence of the organizational structure so that it can lead to work quality, work quantity, and time utilization. Effectiveness describes the entire cycle of inputs, processes, and outputs, refers to the results of an organization, plan or activity, and shows how far the goals have been achieved. Therefore, if the expected goals or objectives can be achieved according to the plan, and can provide the expected results or benefits, then an organization, plans and activities are said to be effective.

In order to achieve work effectiveness, PTN V decided to start utilizing technology. Information technology itself is a general term for any technology that helps humans to create, change, store, communicate and/or disseminate information. According to Jogiyanto (25:8 in the book "Analysis and Design of Information Systems" states that information is defined as data that is processed into a form that is more useful and more meaningful to those who receive it.

The information technology used by the company, namely in the form of drones, is expected to provide accurate information regarding the number of oil palm trees to basic health conditions and geographical conditions of the land. With the use of drones, the information obtained by the company becomes more precise and accurate.

With this accurate information, it certainly affects the effectiveness of the company's work. To determine the effectiveness of the company's own work, there are 3 indicators that can be used, namely; Work quality, Work quantity, and Time utilization.

REZULTS BASED ON HASIBUAN THEORY

Work Quality

The first indicator to assess or measure work effectiveness is the quality of work. Quality of work is an attitude shown by employees in the form of work results in the form of neatness, accuracy, and linkage of results without ignoring the volume of work in doing work. From this understanding, it can be said that one of the determinants of work effectiveness is how the results of the work carried out by employees are. If the results are good, it can be said that the work is effective.

Based on the results of the study, PTPN V carried out company activities manually which was vulnerable to human error, this would certainly be detrimental to the company. In addition, the manual method also takes a long time. These two things

certainly affect the quality of the company's work. The drone used by the company is the Trinity F9+, which is a drone used in agriculture/agriculture, an unmanned aerial vehicle used in agriculture to help monitor plant growth. Sensors and digital imaging capabilities can provide farmers with richer images. The use of drones in this kind of work is very promising for accurate and precise data because everything is set automatically in the application so that when the drone is flown with the help of a remote control, the drone will fly and move according to a predetermined layout.

Before using information technology in the form of drones, the company carried out this activity manually, namely with workers who went directly to the garden to calculate the principal amount, check plant health, soil fertility, and others. This is vulnerable to human error because humans can certainly make mistakes, especially in calculating. If the difference between the results of manual calculations by workers differs greatly from the actual number, it will certainly cause losses. This is closely related to the use of fertilizers. If the calculation is wrong, there can be a shortage of fertilizer or an excess of fertilizer. If there is a shortage of fertilizer, then it can hamper the company's performance because of course it will take more time to add fertilizer. If there is an excess of fertilizer, it can cause losses where there will be more fertilizer left than the existing tree. In addition, the manual method also allows for data manipulation which can lead to corruption. If workers are dishonest, this can be used as an opportunity to manipulate data where the basic count will be overstated than the actual number, so that it will require more fertilizer.

Work Quantity

The next indicator used to see the effectiveness of work in PTPN V is the quantity of work, namely the volume of work produced under normal conditions. This can be seen from the number of workloads and conditions that can be or experienced during work. Quantity is an important indicator in assessing the effectiveness that leads to the goals achieved without prioritizing the sacrifices incurred.

Based on the research results, the company has succeeded in increasing the quantity of work, where the quantity of work can be interpreted as how much work can be done in a certain period of time. It used to take one to two weeks to calculate the total number of palm trees owned by the company. However, after the use of drones, the company only needed more than a week to calculate the total number of palm trees in the company's oil palm plantations.

Time Utilization

The last indicator used to assess the effectiveness of work at PTPN V is the use of time, namely the use of the working period that is adjusted to company policy so that the

work is completed on time.

In addition to paying attention to the way of working and the quality of work, it is also necessary to pay attention to working time. If a job is carried out for a long time, it cannot be said to be fully effective, because every organization or company must have a target. If the company spends a lot of time on one job then other jobs can be neglected. Companies must be wise in using their time to be agile and productive companies.

In terms of time utilization, the use of drones is the right step that has been taken by PTPN V because technological sophistication has cut a lot of time needed to take care of the company's principal.

Before using information technology in the form of drones, PTPN V spent a lot of time calculating the number of palm trees, but after using drones the time required became shorter. Previously, PTPN V could spend quite a long time calculating the number of palm trees, looking at the condition of the land, checking the condition of the soil and plants, with limited yields. After using the drone, all the necessary data can be obtained within a week. Thus, PTPN V can save a lot of time so that work can be completed faster.

INHIBITING FACTORS OF PT PERKEBUNAN NUSANTARA V'S WORK EFFECTIVENESS IN THE APPLICATION OF GEOSPATIAL TECHNOLOGY

Weather

Weather is one of the determining factors in the use of drones, considering that drones are electronic devices so they cannot be exposed to water. Weather is an important factor in the application of this geospatial technology, where the weather determines whether drones can be flown or not. Weather can be the reason for not achieving the work targets owned by PTPN V, where if bad weather persists for a long time, the work will be delayed longer. Weather conditions that are almost unpredictable make workers have to take bold steps to keep going down to the field, not to mention the weather conditions are also different from the office location with palm oil fields which can be hundreds of kilometers apart.

CONCLUSION

Based on the results of research that has been carried out regarding the Work Effectiveness of PT Perkebunan Nusantara V in the Application of Geospatial Technology (PTPN Sei Pagar Work Unit), it can be concluded that the effectiveness of PTPN V's work in the application of information technology in the form of drones can be said to be good. Judging from the 3 indicators used by researchers, namely work quality, work quantity, and time utilization, PTPN V can be said to have fulfilled these three indicators. In terms of work quality, it is clear that PTPN V's work quality has increased where when using

the manual method there are often human errors and data manipulation by workers. After using the drone, the data becomes valid and there is no more data manipulation so that the work results are better. In terms of work quantity, it can be seen that the work volume of PTPN V increased after using drones.

In a short time, the workers were able to complete the work in the form of calculating the total number of principals in all PTPN V's plantations so that data was received more quickly. Then lastly, in terms of time utilization, PTPN V shortens the time in its work a lot after using drones. Whereas previously PTPN V needed a lot of time to calculate the principal because it was done manually, namely calculating the principal one by one. There are factors that can hinder the effectiveness of PTPN V's work in the application of technology, namely weather. Drones cannot be flown in rainy weather and strong winds, so if at the time of the schedule to fly the drone the weather is not good then it has to be postponed. This makes work delayed and cannot be carried out according to a predetermined plan.

Suggestion

Based on the results of the research that has been done regarding the Work Effectiveness of PT Perkebunan Nusantara V Pekanbaru in the Application of Information Technology, the researcher gives a few suggestions, namely because the work effectiveness of PTPN V in the application of technology has been going well, the authors can only provide suggestions for PTPN V to remain consistent on what has been achieved so far, both in terms of results and quality and continue to make good use of existing technology. Do not let the quality that has been owned decreases so that it affects the existence of the company. Then, PTPN V should look for the best solution in forecasting the weather, if necessary PTPN can cooperate with agencies or agencies engaged in meteorology so that they can receive regular reports on weather conditions.

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