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BARCODE SYSTEM MANAGEMENT MODEL ON OIL PALM COMPANY PERFORMANCE: FIT VIABILITY APPROACH

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Abstract: The use of innovative technology, such as the barcode system, has the potential to enhance the performance of palm oil companies. To better understand the impact of the Fit-Viability-Use barcode system on business performance, a study was conducted. This research aimed to examine the relationship between fit, viability, and use of the barcode system with business performance in the context of an oil palm company. The study utilized a sample of 237 employees, selected through stratified proportional random sampling, from PT LNK between April 2022 and June 2022. The data was analyzed using SEM-PLS analysis with SMART PLS 3 software. This paper presents an overview of the Fit-Viability approach to the Barcode System. The results showed that business performance was positively influenced by viability and use, while fit had no significant effect. The findings can be useful in further developing the barcode system at PT LNK, and it is recommended that other palm oil companies adopt this technology and integrate it into cloud-based data for real-time production data.

Keywords: Fit; Viability; Use; Business Performance; Oil Palm Company; Barcode System; SEM-PLS.

INTRODUCTION

Indonesia has earned the coveted title of being the foremost creator and supplier of Crude Palm Oil (Cherie, Rini, and Makky 2019; Makky and Berd 2018). With a steady increase from 1998 until 2017, Indonesian CPO maintains its comparative market edge (Yanita, Napitupulu, and Rahmah 2019). This rise in production is in tandem with the rapid expansion of oil palm plantations across Indonesia, symbolizing a revolution in the cultivation of oil palms. Spread across 22 out of the 33 provinces, Sumatra and Kalimantan Islands serve as the two primary centers of oil palm plantation development in Indonesia (Purba and Sipayung 2017). Notably, land area emerges as a key factor having a substantial impact on palm oil production in (Yanita and Suandi 2021).

In Indonesia, the use of technology in improving the performance of local companies is still very low. This is supported by Jelita et al. (2020) who concluded that the use of renewable technology is still dominated by foreign private companies. The novelty of technology will be able to improve the performance of palm oil companies. Therefore, a study is needed to find out how much influence the Fit-Viability-Use barcode system has on the performance of palm oil companies.

To accurately forecast palm oil production, companies in the industry are turning to Information and Communication Technology (ICT) as a solution for enhanced efficiency. ICT can be leveraged through various applications, such as an expert system for diagnosing oil palm plant disease. Irawan et al. (2018) recommend coconut seeds and ideal palm oil mill locations in (Annisa et al. 2020), and an information system for oil palm production in (Bakti 2020).

One of the most effective ICT tools available to palm oil companies is the barcode system. This technology is used to track employee data, with the aim of increasing work efficiency and productivity. The HR department plays a critical role in ensuring efficiency, particularly in relation to work activities and time management (Samsuni 2017). Therefore, an optimal work system design is necessary to achieve a successful production process through the use of barcode technology. PT. Langkat Nusantara Kepong (LNK), an Operational Cooperation company engaged in agro-industry business specializing in palm oil production, is an example of a company that has implemented the barcode system.

In Indonesia, the utilization of technology for improving the performance of local companies remains low. As noted by Jelita et al. (2020), renewable technology is still predominantly used by foreign private companies. The implementation of innovative technologies could significantly improve the performance of palm oil companies. Hence, further research is required to examine the impact of the Fit-Viability-Use barcode system on the performance of palm oil companies.

MATERIALS AND METHODS

Framework

The theoretical framework presented is a refined version of the Task Technology Fit model (Liang et al. 2007), with a focus on the individual-level analysis of technology adoption. The Fit-Viability Theory serves as a tool for evaluating the efficacy of an Information and Communication Technology (ICT) object within an organization, based on two dimensions: Fit and Viability. The Fit dimension gauges the consistency of a new ICT object in aligning with the core values, structure, and culture of an organization. The Viability dimension evaluates the potential added value of the ICT object in relation to human resource requirements, capital requirements, and other relevant factors. In essence, this theory explains how the suitability of a technology for a specific task and the continuity of its use can significantly impact performance.

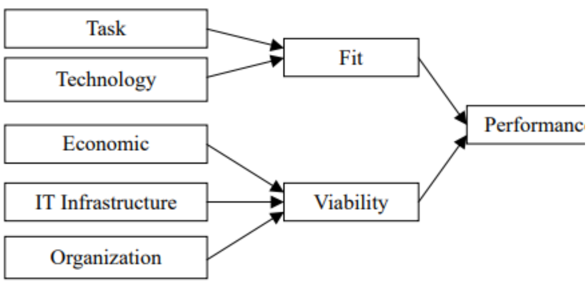

Figure 1. Fit-Viability Model (Liang, 2007).

The previously discussed framework indicates that Task and Technology serve as indicators of the Fit construct. Essentially, the Fit construct is evaluated by measuring its dimensions, which are Task and Technology. Similarly, economic factors, IT infrastructure, and organization are indicators of the Viability construct for an implemented IT object. Thus, the Viability construct is assessed by measuring its dimensions, which are economy, IT infrastructure, and organization/ management.

In addition to the previous discussion, it is worth noting that the Fit and Viability constructs have a significant impact on performance. This highlights the importance of using the Fit-Viability Theory to evaluate the effectiveness of the barcode system in palm oil companies. Specifically, the theory can be applied in the following ways:

1. Task construct is a significant construct that is closely related to employee attendance and the calculation of fruit harvest. By evaluating the extent to which the barcode system fits into these tasks, companies can determine whether the technology is effective in improving task-related performance.
2. Technology construct describes the characteristics of the technology used in the barcode system. This construct can be evaluated to assess whether the technology is suitable for the needs of the company and whether it is effective in enhancing productivity.
3. Economic construct considers how the budget fits and transaction costs required to implement the barcode system. By evaluating the economic feasibility of the technology, companies can determine whether the benefits of using the system outweigh the costs.
4. IT Infrastructure construct describes software and hardware availability and data management in the barcode system. This construct can be used to

evaluate the effectiveness of the system in managing data, and whether the infrastructure supports the successful implementation of the technology.

5. Organizational construct discusses how the production process takes place, the existence of re-engineering, and the competency of employees with ICT. By assessing how the barcode system fits into the production process and how it impacts the competency of employees, companies can determine the overall effectiveness of the technology in improving organizational performance.
6. Performance construct describes satisfaction, positive influence, and consistency of the barcode system in helping work. This construct can be evaluated to determine the level of satisfaction among employees and the extent to which the technology has a positive impact on performance.

The intensity of use is an additional construct that can impact the performance construct, which has been established through several studies. According to a research conducted by Gozi and Felicia (2019), the usage of ICT can have an impact on the quality of employee performance. Since employee performance is a critical component of a company's overall performance, it can be inferred that ICT utilization can influence enhancing the company's performance. The proposed research framework is outlined below.

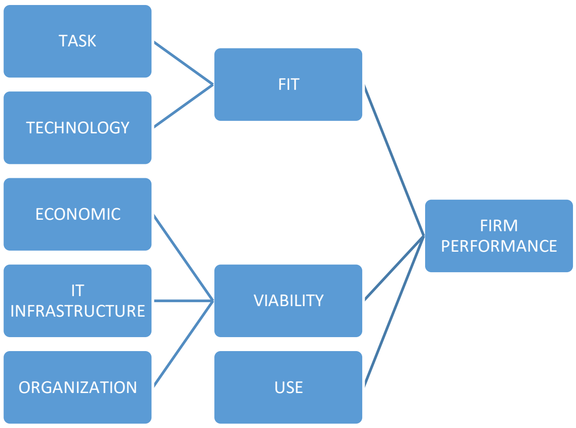

Figure 2. Framework

Figure 2 illustrates that the Fit Construct is made up of multiple dimensions, namely Task and Technology, while the Viability Construct also comprises of several dimensions, namely Economic, IT Infrastructure, and Organization. Furthermore, the Constructs of Use, Fit, and Viability can all have an impact on the Performance Construct. The study intends to measure various responses and expla(Sugiyono 2010)natory variables concurrently, and for this purpose, Partial Least Square (PLS) will be utilized as an analytical method. PLS is a suitable alternative for solving intricate multilevel models that do not require a large sample size. Additionally, PLS has numerous benefits, including optimal implications for prediction accuracy, and it is a potent analytical method as it does not assume a data measurement scale, and it can be utilized to confirm the theory.

Sampling Method

The data used in this study included both primary and secondary sources. Primary data was collected through employee interviews, while secondary data was obtained from various sources such as production data and records of production increases from each estate.

The focus of this study was on the estates of PT Langkat Nurasantara Kepong, including Padang Brahrang, Bekiun, Tanjung Keliling, Marike, Bukit Lawang, Johor Lama, and Tanjung Beringin. From these estates, a sample of four were selected for the research: Basilam, Bekium, Padang Brahrang, and Johor Lama. The total number of employees in these four estates was 1,870 individuals. The stratified proportional random sampling technique was used to ensure that each sampling unit in the population was represented in the sample (Lubis 2021). This technique was chosen due to the relative homogeneity of the variables under study, which were the employees of oil palm plantations at PT. Langkat Nusantara Kepong.

Determination of the samples number from a certain population developed by Issac and Michael for error rates of 1%, 5%, and 10% can be calculated using the following formula (Sugiyono 2010) :

$$s = \frac{x^2.N.P.Q}{d^2(N-1)+x^2.P.Q}$$

Notice :

- s = Sample
- N = Population
- X^2 = The value of chi squared with degrees of freedom = 1
- P = Probability of accepting that an event is said to be true, assuming the value = 0,5 (50%)
- Q = Probability of accepting that an event is said to be false, assuming the value = 0,5 (50%)
- d = The value of precision/percentage of difference in answers from the questionnaire for each question item, assuming the value = 0,05 (5%)

$$s = \frac{2{,}706 \text{ x } 1870 \text{ x } 0{,}5 \text{ x } 0{,}5}{(0{,}05)^2\ (1870-1)\ +\ (2{,}706 \text{ x } 0{,}5 \text{ x } 0{,}5)}$$

$$s = 236{,}45 \text{ (rounded to 237)}$$

Table 1 illustrates the random sampling technique used in each estate to ensure the representativeness of the population. It displays the distribution of the population and samples in each oil palm plantation, which served as the research location.

Table 1. Population and Sample

No	Estates	Population	Samples
1	Basilam	1048	132
2	Bekiun	250	32
3	Gohor Lama	373	47
4	Padang Brahrang	199	26

Amount	1.870	237

Source: PT. Langkat Nusantara Kepong, 2021.

Partial Least Square Analysis

To test complex hypotheses about the direct or indirect relationships between variables, the Partial Least Square (PLS) analysis method can be employed by combining regression and path analysis. This method can depict the whole relationship between the dependent and independent variables in a single analysis. The SMART PLS 3 software is one of the programs that can be utilized for PLS analysis. It can depict all the relationships constructed in the theory-based model, enabling the analysis of the impact of Fit Viability and barcode system usage on Company Performance, as well as other variables that influence Fit Viability.

Partial Least Square (PLS) analysis has several advantages over other statistical methods, as pointed out by Hair et al. (2017). One of the key advantages is that PLS can operate complex models, where there are a large number of dependent and independent variables. This means that PLS is an effective method for analyzing complex data sets that might be difficult to analyze using other methods. Another advantage of PLS is that it can handle multicollinearity problems between independent variables. This is important because multicollinearity can cause problems in traditional regression analysis. Additionally, PLS is able to process data with missing or abnormal data, while still producing solid and reliable results.

Another advantage of PLS is that it can be used with both reflective and formative constructs. Reflective constructs are used to measure a single variable, while formative constructs are used to measure a composite variable that is made up of several underlying variables. PLS can also be used on small samples, and the data does not have to be normally distributed, which makes it a flexible analytical tool. Lastly, PLS can handle data with different scale types, including nominal, ordinal, and continuous, making it suitable for a wide range of data types.SEM and PLS have some differences. PLS is predictive whereas SEM generally tests theory. PLS has a measurement model and a structural model. The measurement model is the relationship between the observation variable and the latent variable. While the structural model explains the relationship between latent variables. Therefore, the measurement model must be valid and reliable, while the structural model is assessed by evaluating the explanatory power and the significance level of the path coefficient.

In order to evaluate the accuracy of the model, the first step is to examine the outer reflective indicator model. There are three criteria used to evaluate the outer reflective indicator model: Convergent validity, Compositer reliability, and Discriminant validity. Once these criteria have been met, the second step can be taken to evaluate the inner model. This is done by analyzing R-square, Q-square, Goodness of fit (GoF) and F-square. R-square assesses the degree to which the dependent latent variable has a significant impact. Q-square measures the accuracy of the values generated by the model. Goodness of Fit (GoF) assesses the validity of the structural model.

Variables

In this study, the variables being investigated are concepts that can be measured. These variables include both latent variables and manifest variables that act as indicators of the latent variables. In order to measure the latent variables, indicator variables are used. Manifest variables, also known as indicator variables, are variables that describe or quantify the underlying latent variable being studied.

Table 2. Latent and Indicator Variable

Latent Variable	Manifest Variable (Indicator)	Keterangan
Task	Worker discipline (TS1)	The level of discipline of workers on the barcode system
	Work System (TS2)	Planning, implementation and evaluation
	Business Process Sustainability (TS3)	Carried out continuously with the same system and there is always maintenance
	Task Understanding (TS4)	Workers understand the tasks assigned
Technology	Selling System (TC1)	Barcodes on sales
	Collecting system (TC2)	Barcodes on fruit collection
	Delivery tracing system (TC3)	Barcodes in shipping tracking
Economic	Biaya Total (EC1)	Cost compatibility with budget
	Biaya Transaksi (EC2)	More efficient transaction fees
IT Infrastructure	Software (IT1)	App availability
	Hardware (IT2)	Device availability
	Data management (IT3)	Management of stored data every day
Organization	Organization System (OG1)	Structuring the position structure within the company
	Production Process (OG2)	The role of the organization in the production process
	Worker Competencies (OG3)	The ability of workers to carry out work
	Work Culture (OG4)	Culture formed in the working environment of the barcode system
Fit	Suitability (FT1)	The suitability of the work system desired by workers
	Dependency (FT2)	Dependence of workers with a work system with a barcode system
Viability	Improvment (VB1)	Possibility of continuous system improvement
	System Continuity (VB2)	Continuity between planning, implementation

		to evaluation
Use	Intensity (US1)	Intensity of using barcode system and irreplaceable
	Planning, implementation and evaluation (US2)	Use of barcodes in planning, implementation and evaluation
Performance	Production Volume (PF1)	Number of fruits produced
	Increase of Production (PF2)	Increased production during the implementation of the barcode system
	Error System (PF3)	Barcode error rate

Source : Liang *et al.* 2007

Measurement Model Evaluation

To ensure that the manifest variable (indicator) accurately measures the latent variable (construct), an assessment is necessary. The assessment involves determining the validity of the manifest variable based on the loading factor value. If the loading factor value is greater than 0.7, the manifest variable is considered valid. Conversely, if the loading factor value is less than 0.7, the manifest variable must be excluded because it is deemed inadequate in measuring the latent variable.

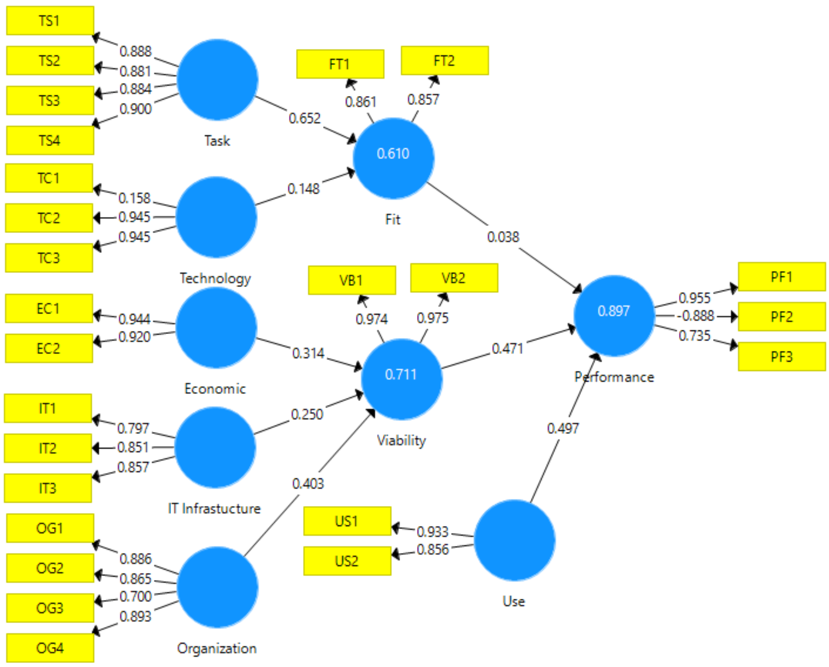

Figure 3. First Model

Table 3. L*oading Factor* Value

Variabel Manifest	λ	Descriptio n
Worker Discipline (TS1)	0.888	Valid
Work System (TS2)	0.881	Valid
Business Process Sustainability (TS3)	0.884	Valid

Task Understanding (TS4)	0.900	Valid
Selling System (TC1)	0.158	Not Valid
Collecting system (TC2)	0.945	Valid
Delivery Tracing System (TC3)	0.945	Valid
Total Cost(EC1)	0.944	Valid
Transaction Cost (EC2)	0.920	Valid
Software (IT1)	0.797	Valid
Hardware (IT2)	0.851	Valid
Management Data (IT3)	0.857	Valid
Organization System (OG1)	0.886	Valid
Production Process (OG2)	0.865	Valid
Worker Competencies (OG3)	0.700	Valid
Work Culture (OG4)	0.893	Valid
Suitability (FT1)	0.861	Valid
Dependency (FT2)	0.857	Valid
Improvment (VB1)	0.974	Valid
System Continuity (VB2)	0.975	Valid
Intensity (US1)	0.933	Valid
Planning, implementation and evaluation (US2)	0.856	Valid
Production Volume (PF1)	0.955	Valid
Increase of Production (PF2)	-0.888	Not Valid
Error System (PF3)	0.735	Valid

The initial model created in Figure 4 was evaluated based on the loading factor value of each variable, and the results are presented in Table 4. The evaluation showed that two variables, Sales System (TC1) and Production Increase (PF2), had a loading factor value less than 0.7, indicating invalidity. This implies that the barcode system implemented by PT LNK has not reached the sales stage, and the Production Increase variable is not an accurate measure of performance due to the slight increase in production in the estates with the highest average production compared to those with low production average but significant increase after the barcode system implementation. Therefore, a second-stage test was conducted without including the invalid variables to obtain a final valid model. In this model, all indicator variables had a loading factor value greater than 0.7, indicating their validity. The final model can be seen in Figure 4, and all values leading to the yellow box (loading factor value) have a value above 0.7, indicating that all variables are valid and can be used in the model.

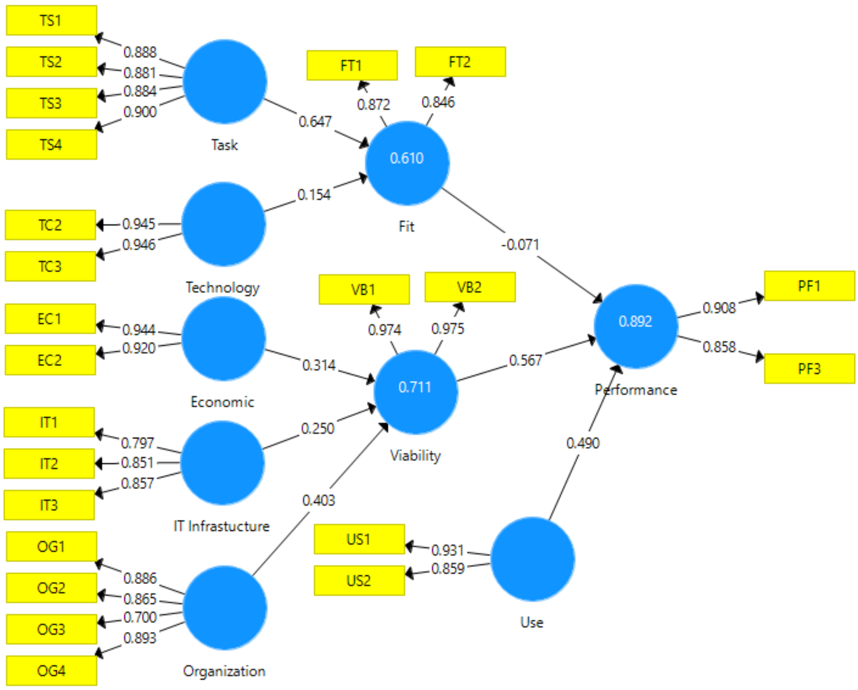

Figure 4. Final Model

The model's reliability is crucial in ensuring trustworthy results. A model can be considered reliable if it has an AVE value and composite reliability greater than 0.5 and 0.7, respectively. The AVE value indicates the amount of variance in the construct that is captured by its indicators, while the composite reliability represents the internal consistency of the construct. In Table 5, all variables have an AVE value greater than 0.5 and a composite reliability greater than 0.7, indicating that the model is reliable and can be trusted to measure the constructs.

Table 5. Average Extracted (AVE), Compose Reliability, Cronbach Alpha, and Cross Loading Value

Latent Variable	AVE	Compose Reliablity	Cronbach Alpha	Cross Loading
Task	0.789	0.937	0.911	0.888
Technology	0.894	0.944	0.882	0.946
Economic	0.869	0.930	0.850	0.932
IT Infrastructure	0.698	0.874	0.787	0.836
Organization	0.705	0.905	0.760	0.840
Fit	0.738	0.849	0.645	0.859
Viability	0.949	0.974	0.947	0.974
Use	0.803	0.890	0.760	0.896
Performance	0.781	0.877	0.722	0.884

The following step in evaluating the measurement model involves checking its unidimensionality using the Cronbach alpha indicator. A value of 0.6 or higher indicates that the indicator is good. As presented in Table 5, all variables in the model have a Cronbach alpha value above 0.6, indicating good unidimensionality of the model.

The next stage is to assess discriminant validity, which ensures that different constructs are not highly correlated. The Fornell and Larcker method can be used to test discriminant validity, which examines the cross-loading value that must be at least 0.50, meaning that at least 50% of the variation of the indicator can be explained. In Table 5, all variables have a cross-loading value greater than 0.500, indicating no problem of discriminant validity in the evaluated models. Thus, after meeting all requirements, the model can be declared as the final model.

Structural Model Evaluation

Table 6. R-square Value

Latent Endogen Variable	*R-Square*	Keterangan
Viability	0.711	Sedang
Fit	0.610	Sedang
Performance	0.892	Kuat

To evaluate the structural model, one can examine the R-square on the endogenous variables and the estimated value of the path parameter coefficients. A strong model has an R-square of 0.75, a medium model is 0.50, while a weak one has an R-square of 0.25. The values of R-square in Table 6 indicate that the factors used to measure the Fit, Viability, and Performance variables can explain 71.1 percent, 61 percent, and 89.2 percent of the values, respectively, while the remaining percentage is explained by other variables not included in the model.

The next step is to assess the Q-square value (predictive relevance) to determine how well the observed values produced by the model and the parameter estimates match. The Q-square value ranges from 0 to 1, where a higher value indicates a better fit.

Q-*square* = 1 - (1 - 0.711) (1 - 0.610) (1 - 0.892)
= 1 - (0.289) (0.490) (0.108)
= 1 - 0.015
= 0.985

The result of Q-square is 0.985, meaning the model can explain 98.5 percent of the phenomena that occur, and the rest is explained by other variables that are not in the model.

Goodness of Fit

Goodness of Fit (GoF) is used to measure structural model is valid or not. The GoF value is obtained manually by using the formula for the root mean of the AVE multiplied by the average R-square. Calculation of goodness of fit using the formula:

$$GoF = \sqrt{\overline{AVE} \times \overline{R^2}}$$

The result of the Goodness of Fit on the model is 0.770, meaning the suitability of the model is high.

Hypothesis Testing

Hypothesis testing can use the t-table value, for alpha 5% is 1.96. The hypothesis is accepted if t-statistics > t-table and the hypothesis is rejected if t-statistics < t-table. The results of direct effect hypothesis testing on the model can be seen in Table 9 which the hypothesis of the influence of Technology on Fit and Fit on Performance is declared rejected and the rest of the other hypotheses are accepted. The result of indirect effect hypothesis testing can be seen in Table 10 which the hypothesis of the Fit on Performance and Technology on Performance is declared rejected and the rest of the other hypotheses are accepted.

Table 7. Direct Effect

Hipotesis	Original Sample	T-statistik	Description
Task -> Fit	0.647	8.999*	Accepted
Technology -> Fit	0.154	1.943	Rejected
Economic -> Viability	0.314	7.621*	Accepted
IT Infrastructure -> Viability	0.250	2.823*	Accepted
Organization -> Viability	0.403	4.324*	Accepted
Fit -> Performance	-0.071	1.893	Rejected
Viability-> Performance	0.567	11.726*	Accepted
Use -> Performance	0.490	8.885*	Accepted
Note : *t-tabel(0.05): 1.96			

Table 8. Indirect Effect

Hipotesis	Original Sample	T-statistik	Description
Task -> Performance	-0.046	1.803	Rejected
Technology -> Performance	0.011	1.393	Rejected
Economic -> Performance	0.178	7.158*	Accepted
IT Infrastructure -> Performance	0.142	2.844*	Accepted
Organization -> Performance	0.229	3.673*	Accepted
Note : *t-tabel(0.05): 1.96			

RESULTS AND DISCUSSION

PT. Langkat Nusantara Kepong (LNK) is a joint venture between PT. Perkebunan Nusantara II (PTPN II Persero) and Kuala Lumpur Kepong (KLK) Plantation Holdings

Malaysia in the agro-industry business. LNK has implemented a barcode system across all levels of employees, from assistants to senior managers and field staff, for attendance and fruit counting data. This system allows employees to input information such as harvest date, time, number of fruit, harvester's name, and location, which is then processed for wage distribution. Attendance data is also collected through the barcode system, including employee names, dates and times, types of work, and fields. In addition, the system manually inputs data for overtime, off days, premiums, and adjustments. The barcode system aims to improve employee work efficiency and increase palm oil production. Despite its benefits, many other palm oil companies have yet to adopt this system. The barcode system can increase employee productivity, find out production and productivity data, and evaluate any problems that arise. Research has also shown that the barcode system significantly improves employee performance and reduces paper costs.

By implementing the barcode system, PT. LNK can ensure that their employees are responsible for the designated harvest areas and that they cannot move without recording their actions in the system. The barcode system also allows the company to identify unharvested areas and track crop rotations and fruit quality. The harvest foreman can easily access data on workers who are not meeting standards, leading to an increased focus on crop checks and improvements in harvesting techniques. Additionally, the barcode system provides comprehensive data on production and productivity, making it easier for the company to identify any issues and develop solutions. With the barcode system, employees can also calculate their bonus and monthly income based on their performance, which can boost their motivation and productivity. Overall, the use of the barcode system has proven to be a valuable investment for PT. LNK can potentially benefit other palm oil companies in the industry.

Fit

The Fit variable was explained by the Suitability (FT1) and Dependency (FT2) variables. Part of the Task indicators is Worker Discipline (TS1), Work System (TS2), Business Process Sustainability (TS3), and Task Understanding (TS4). The results showed that the Fit variable was influenced by Task.

After analyzing the data, the researchers found that the Fit variable was influenced by the Task. This suggests that the nature of the task being performed, and the conditions under which it is being performed, are important factors in determining whether an individual or system is well-suited for the task at hand.

Different from the Technology variable which does not affect Fit. Part of the Technology indicators is the Collecting System (TC2), and Delivery Tracing System (TC3). some employees say it doesn't match the barcode system.

Viability

The indicator variables, Improvement (VB1) and System Continuity (VB2) provide a comprehensive explanation of the

Viability variable. The study finds that the Viability variable is positively impacted by the Economy, IT Infrastructure, and Organization, indicating that an increase in these variables will enhance the viability of the Barcode System in palm oil companies. Notably, the Organizational variable has the greatest influence with an original sample value of 0.403. This aligns with prior research on the role of the Barcode System as a Management Information System, facilitating decision-making and problem-solving for leaders. As Paoki (2012) suggests, an information system can identify issues by generating alternative designs, selecting actions, and assessing feasibility.

Use

According to the findings of the study, implementing a barcode system has a positive impact on the performance of palm oil companies. It offers various advantages, such as reducing errors in calculations, facilitating fruit quality determination, minimizing paper usage, and speeding up information delivery. Other research by Istiqomah et al (2019) demonstrates that applying barcodes in warehouse management can reduce errors in receiving and storing goods, speed up the receipt and retrieval of goods, help determine storage locations, assess the quality of goods, and reduce paper usage. Furthermore, the use of barcodes can enhance the efficiency of information and data reporting, making processes faster and more streamlined. Consequently, warehouses that have implemented barcode systems are more efficient and productive compared to those that rely on manual handling. This paper is also in line with Suriwan's Wanitwattanakosol, Attakomal, and Suriwan (2015) research, which demonstrates that implementing barcodes in warehouses has lots of benefits, including the ability to minimize errors in the receipt of goods and speeds up the receipt of goods, can automatically determine the location of storage, minimize errors in storing goods at the storage area, minimize location and goods picked errors by the picker, minimize location and goods picked errors by the picker, minimize location and goods picked errors by the picker, minimize location and goods picked errors by the picker, minimize location.

Fresh fruit bunches in oil palm must be harvested at optimal ripe conditions (Misron et al. 2017). The Barcode system rejects unripe fruit. The use of a barcode system supports companies to produce high-quality CPO. The use of a barcode system helps to ensure that only ripe fruit is harvested, which can improve the overall quality of the CPO produced. This is because unripe fruit can negatively affect the oil yield and quality, resulting in lower overall production and revenue. By using a barcode system to reject unripe fruit, companies can improve the overall efficiency and effectiveness of their operations, and ultimately deliver a higher quality product to their customers (Boulos et al. 2015).

The Effect of Fit, Viability, and Use of Barcode System on Performance

The original sample values of 0.567 and 0.490 show that Viability and use have a significant impact on business performance. The hypothesis suggests that any increase in Viability and use will lead to improved performance. However, Fit does not affect business performance as per the hypothesis, with an original sample value of -0.071. In practice, some employees dislike the barcode system, which prevents them from manipulating harvest data for personal gain, particularly in high-production estates. Although the implementation of the system has increased efficiency and production, there are some unhappy parties due to its impact on employee income, which the company may not be fully aware of. It's worth noting that the barcode system has only been in place for the past 5 years at PT LNK, and while it has received positive feedback from many, there are still some concerns that need to be addressed.

The results from the original sample values indicate that the performance of a business is greatly affected by Viability and use, with values of 0.567 and 0.490 respectively. The hypothesis further states that any increase in Viability and use will lead to an improvement in business performance. On the other hand, Fit was found to not affect business performance, with a sample value of -0.071, which goes against the hypothesis. It has been observed that some employees are not in favor of the barcode system because it prevents them from manipulating harvest data for personal benefit, especially in high-production estates. While the implementation of the barcode system has brought about increased efficiency and production, there are still some employees who are unhappy with its impact on their income. It is possible that the company may not have a complete understanding of the issue. It is important to note that the barcode system has only been in use at PT LNK for the past five years and, while it has received positive feedback from many, there are still some issues that need to be addressed.

The Effect of Task, Technology, Economic, IT Infrastructure and Organization on Performance

IT Infrastructure, Economic factors, and Organization indirectly impact business performance, while Task and Technology do not directly affect performance. Surprisingly, the implementation of a barcode system, specifically for attendance tracking, did not seem to impact employee discipline, contradicting some established theories. This finding aligns with Cay's et al. (2021) research, which similarly concluded that the use of fingerprint attendance tracking did not affect employee discipline. While technology such as the barcode system can bring many benefits, it is essential to recognize its potential limitations and unintended consequences to make informed decisions about its use in the workplace.

Policy Impact

The implementation of a barcode system in an oil palm company can have significant policy implications, particularly concerning environmental sustainability and labor practices. On the one hand, the use of a barcode system can help companies to produce higher-quality crude palm oil (CPO) by ensuring that only ripe fruit is harvested. This can help to increase efficiency and reduce waste, which can in turn have positive environmental implications by reducing the overall environmental footprint of the company (Zulham et al. 2022).

However, there are also potential risks and challenges associated with the implementation of a barcode system in the oil palm industry. One concern is that the increased efficiency and productivity associated with the use of such technology could lead to greater pressure to clear more land for oil palm cultivation. This could have significant negative environmental consequences, including deforestation, habitat loss, and increased greenhouse gas emissions.

In addition, there are also concerns about labor practices and worker rights in the context of the implementation of a barcode system. For example, some workers may be negatively impacted by the use of this technology, particularly if it results in reduced pay or loss of bonuses. Furthermore, there is a risk that the implementation of such technology could exacerbate existing labor abuses, including forced labor and exploitation, particularly in areas where labor laws and regulations are weak or not effectively enforced (Zulham et al. 2023).

In light of these concerns, it is important for oil palm companies to carefully consider the potential impact of implementing a barcode system and to take steps to ensure that the technology is used in a socially and environmentally responsible manner. This may include investing in training and education for workers, working with local communities and stakeholders to minimize the environmental impact of oil palm cultivation, and ensuring that workers are fairly compensated and their rights are protected.

CONCLUSIONS

The barcode system is a powerful tool that provides numerous benefits to businesses, particularly in the palm oil industry. Firstly, the use of the barcode system can result in significant cost savings for companies, as it minimizes the need for manual labor and reduces the occurrence of errors in counting and data entry. Moreover, the barcode system also ensures the accuracy of fruit counting, which is crucial in the palm oil industry, as it affects the quality and quantity of oil produced.

Secondly, the barcode system can improve the work culture within the organization by creating a more efficient and effective work environment. With the implementation of the barcode system, employees can perform their tasks more efficiently and rely on the system to provide accurate data and information. This can result in increased job satisfaction and morale among employees, leading to a positive work culture.

Finally, the barcode system can make it easier for leaders to evaluate and determine the right policies for the company. By providing real-time data and information, the barcode system can help leaders make informed decisions and quickly respond to changes in the market. This can ultimately lead to improved business performance and profitability.

In conclusion, the barcode system is a valuable tool that can provide significant benefits to companies in the palm oil industry, including cost savings, improved work culture, and ease of evaluation for leaders. Company performance is strongly influenced by Usage and Viability, meaning an increase in these two variables will improve Company Performance. In contrast to compatibility, which does not affect performance, this is presumably because the barcode system has only been used in the last 5 years, and needs further studies in the next 5 years. In summary, this research shows that the barcode system can be used in all palm oil companies for performance improvement.

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