Inovation Of Industrial Governance, Calculation Of Effectiveness And Efficiency Of nutmeg grating and extorting machines Through Implementation Of Merdeka Learning Independent Campus In Tomasiwa SMEs

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summary
The Maluku region is famous as a producer of spices, including nutmeg. Nutmeg can be found in several areas in Maluku, including the Morela area, Leihitu District, Central Maluku Regency. In this area nutmeg is not only taken from the flowers (mace) and seeds, but the nutmeg flesh has been used by the local community to make nutmeg juice. Based on the phenomenon of the Tomasiwa Nutmeg Juice UKM, nutmeg juice has been produced although in a very simple way and using a machine that has a small capacity and has an irregular layout and has never calculated the level of efficiency and effectiveness of the machine used. On that basis, we authors aim to arrange the layout of the industry (machinery and equipment) which is still not well organized and calculate efficiency and effectiveness for the use of the machines owned. This paper solves the problem by using an R&D (Research & Development) approach. The result of this paper is the author is able to design the layout according to the flow of the production process, so as to reduce production time and have an impact on the use of labor. In addition, the author is also able to calculate the efficiency and effectiveness of the machine used by UKM Tomasiwa Nutmeg Juice. The results show that the use of production machines with machine trial simulations according to the needs of UKM Tomasiwa Nutmeg Juice is much more efficient and effective.
Keywords: *engine layout, efficiency and effectiveness.*

I.   Introduction

The government program through the Merdeka Learning Campus Merdeka (MBKM) is a learning method that must be carried out by universities. Therefore, each university seeks to implement the MBKM program, including through service and research activities. The implementation of the activities carried out by the author and a team in collaboration with students is located at UKM Tomasiwa.

Tomasiwa Nutmeg Juice UKM, which is located in Morela village, has its own uniqueness. This UKM has been around for a long time, since 2009. When it was founded, it started to produce nutmeg juice. Its uniqueness is that from its inception to the present, its turnover tends to increase so that it reaches a yearly turnover of approximately one hundred and fifty million rupiah. This SME in producing nutmeg juice only uses raw materials from nutmeg flesh which are usually thrown away by the local community. This nutmeg juice manager began to process the material to be used as nutmeg juice. This is evidenced by the sales turnover of nutmeg juice starting to increase continuously until now, even being unable to serve orders from consumers, especially souvenir centers around the city of Ambon.

This Nutmeg Juice UKM has problems in the production process, including the irregular layout of the industry. This can affect the production process, especially the production time. Apart from that, this UKM has never calculated how much efficiency and effectiveness is carried out in the production process. This paper refers to Hariyanti (2020) who explains that Tomasiwa UKM already has a production machine with a small size and an irregular layout. Thus, it cannot be used for large-scale production. Based on these problems, the authors and the team tried to arrange the industrial layout and calculate efficiency and effectiveness by trying machines that had the required size.

The problem in this article

Based on the explanation above, it shows the problem of Toma Siwa's KUD partners, namely the industrial layout that is still not regular. This has an impact on the production process, especially the production time and the use of the number of workers. In addition, the problem that arises is that they have never calculated

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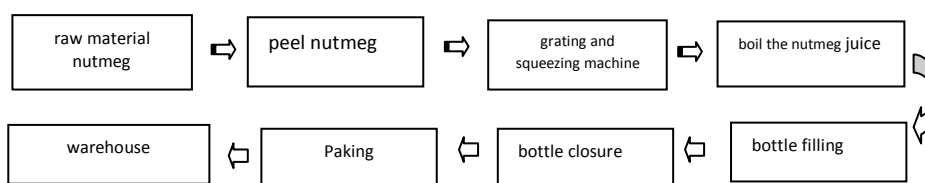
the level of efficiency and effectiveness of the machine used and the author's team also conducted a trial simulation using a machine that suits the needs of SMEs, then the author and the team will calculate the level of efficiency and effectiveness.

Implementation Method

This paper aims to produce industrial layout innovations and calculations of the efficiency and effectiveness of the machines that are owned and the authors also perform simulations using machines that are sized according to the needs of UKM Tomasiwa Nutmeg Juice. Thus, a suitable method for this paper refers to W.R. Borg and M.D. Gall (1989) is a method commonly known as R&D (Research & Development). The author prefers this method rather to refer to the opinion of Borg and Gall that "research & development is very powerful" strategy to improve practice. This method is usually used to produce certain products. The activity step is for the writer and the team to identify the problem, after meeting the problem, then designing an industrial layout innovation and innovation in calculating the efficiency and effectiveness of existing machines and simulations with machines needed by KUD Jus nutmeg Tomasiwa.

II.   Research Result

Able to arrange industrial layout (machinery and others), so that it will have an impact on the time of the production process which will be able to reduce production costs, especially the number of hours of labor costs. This refers to the opinion of Richard Muther (1973) which explains that the SPL (Systematic Layout System). This system is widely used for problems, one of which is the layout of the production process. On the basis of this opinion, the author tries to innovate the layout of the nutmeg juice production process as follows:

Industrial layout innovation image.

In addition to the innovations mentioned above, the author also calculates the efficiency and effectiveness of the machine used and simulations the machine according to the needs of UKM Tomasiwa Nutmeg Juice. The calculation results can be as follows:

Tabel. 1. Engine Efficiency Calculation

No	Description	Before (old machine)		Before (old machine)		Efesiensi
		Number	Units	Amount	Units	
1	Production quantity	620	bottle	806	bottle	186
2	Labor	4	Person	2	Person	2
3	Labor costs (248.000/person)	992.000	Rp	496.000	Rp	496.000
4	Selling price	6.000	Rp	6.000	Rp	
		Total Efficiency per Production				1.612.000	Rp
		Production per Month (10 times production)				16.120.000	Rp
		Efficiency per Year				193.440.000	

Source: Data processed

Based on the table above, there is an annual efficiency of Rp. 193.440.000,- and this value has an impact on increasing the community's economy. In addition to having an impact on the level of efficiency, it also has an impact on effectiveness. The effectiveness of the above activities can be calculated as follows:

Table. 3. Effectiveness Impact

No	Description	Production quantity	Target	Percentage	More effective
1	old machine	6200	9000	68,9	
2	New machine	8060	9000	89,6 *)	20,7

Source: Data processed
Description: *) more effective

III. Conclusion

The results of this activity resulted in an innovative concept of nutmeg juice SMEs layout that was able to affect the time of the production process and the number of workers. In addition, this activity also produces a calculation of the efficiency and effectiveness of the machine owned by UKM Tomasiwa Nutmeg Juice. Based on the calculation, it produces an efficiency of IDR 193,440,000/year and an effectiveness rate of 20.7 percent. This means that using the proposed machine in the form of a simulation is more efficient.

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