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The Role of Technology to Increasing Productivity of Seawood Waste Handicrafts Small Business in Tegallalang Village

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Abstract. The main problem of MSMEs in the marine wood waste handicraft industry is the limited use of appropriate technology in increasing production. the technology used is usually conventional production tools to technological tools that are no longer suitable for use. Constraints in production capacity will cause constraints on MSMEs in increasing productivity because they are hampered by production time. The low productivity of MSMEs will threaten the sustainability of MSMEs in maintaining and increasing their international market considering that so far MSMEs still rely on exports. Production activities by updating technology have a huge impact on production productivity so that the opportunity to export becomes greater. In this community service activity, renewal of equipment used for production is carried out. As a result, productivity in each partner has increased so that it can provide opportunities for both partners to increase their sales.

Keywords: MSMEs, Laut Wood waste handicraft industry, Export, Productivity

INTRODUCTION

The four main challenges for MSMEs in digitalization include digital literacy, product quality, production capacity, and market access. So before entering the digital economy, the steps that need to be prepared by MSMEs are regarding the readiness of production capacity, product quality and quality of human resources in using Information and Communication Technology. Indonesia Based on the SVLK, Indonesia's exports of wood products were recorded at US$14.51 billion, the highest in history and an increase of 7 percent year on year (yoy) where in 2021 exports were recorded at US$13.5 billion. One of the export products in this type of wood is wood crafts. Micro, Small and Medium Enterprises (MSMEs) have an important role in developing the economy of rural communities. Tegallalang Village is a village known as a craftsman village. In this village, marine wood waste becomes handicrafts with export value. Woodcraft is an icon of Tegallalang Village which is a handicraft center in Bali. This marine wood waste craft is one of the superior products in Tegallalang Village because there are abundant raw materials and absorbs a lot of labor and can contribute to regional income because it has exported to foreign countries.

Many problems are faced by partners to be able to spread wider to the international market, one of which is the problem of production capacity. Viewed from the production aspect, there are several problems faced by partners, namely technological problems. Until now, partners use electric-powered machine tools to help production. However, the machines used are past their technical age and some are no longer usable. The machines used are bench boring machines, cutting machines, compressor machines, nail gun tools, cutting machines and grinding machines. The machines have started to break down and some of them have weakened working power

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so that the output of the goods produced does not match the quality of the desired goods, the work becomes very slow and often late in fulfilling orders. This is of course a priority problem in efforts to increase competition in the craft industry in the international market.

THEORETICAL BASIS

Definition of Production Capacity

Production capacity planning is the process of determining the production capacity needed by a manufacturing company to meet changes in demand for each of its products. According to (Ma'arif & Tanjung, 2003). Production capacity planning is a plan for the resources needed by a company to produce certain production targets. In case of fluctuating demand, companies experience difficulties in meeting demand. This is due to an imbalance between supply and demand. The main objective of production capacity planning is strategic production management scheduling to generate effective capacity.

According to (Buffa, 2006), the things that are done in the production capacity planning process are as follows:

1) Predict future demand
2) Prepare material needs or raw materials in physical form
3) Set a planned production schedule to the needs 4. Assess economic growth
4) Determine the operating schedule of production facilities

According to (Yamit, 2011), there are two types of production capacity planning, namely:

1) Short-term capacity planning Short-term capacity planning to anticipate simultaneous events in a limited period of time, for example meeting consumer demand in a relatively short time.
2) Long-term capacity planning Long-term capacity planning is a production scheduling activity that is likely to occur and has been predicted in advance, for example planning large-scale production to commemorate a big day celebration. Meanwhile, according to (Handoko, 2010) production capacity planning is divided into three types, namely: 8 1. Planning for long-term production capacity (long range) of more than one year. Where this planning requires a detailed duration of time to complete, such as building a new factory or adding warehouses and adding production facilities or equipment. To expedite long-term planning, the company prioritizes management approval.
3) Medium-term capacity planning (intermediate range) monthly plans for the next 6 to 18 months. In this case, the company has a variety of alternatives to plan its production, for example, withdrawal of labor, termination of employment, sub-contracting, and purchase of new facilities or equipment.
4) Short term capacity planning less than one month. This planning runs based on company policy for daily or weekly production scheduling. Companies have alternatives to determine their production capacity, such as adding overtime hours, changing production routines, and scheduling workers.

Definition of Productivity

Productivity is a very important factor in maintaining and developing the success of an organization/company. As we know, every organization/company invests vital resources (human resources, materials and money) to produce goods/services. Using these human resources effectively will provide better results. Productivity is theoretically defined as the ratio between output (goods and services) and input (labor, materials and money). Low productivity is a reflection of an organization/company that wastes its resources. And this means that in the end the company loses foreign power and thus will reduce the scale of its business activities. The low productivity of many organizations/companies will reduce the industrial and economic growth of a nation as a whole. Productivity is one of the measuring tools for companies in assessing the work performance achieved by their employees. Productivity is a concept that describes the relationship between capital, land, energy used to produce these results. (Private, 2002:281).

Productivity according to the national productivity council is a mental attitude that always holds that the quality of life today must be better than yesterday and tomorrow must be better than today (Umar, 2000:99). Productivity is how to produce or increase the results of goods and services as high as possible by utilizing human resources efficiently. Therefore, productivity is often interpreted as the ratio between output and input in a certain unit (Sedarmayanti, 2001: 57). Productivity is a comparison between output and input and prioritizing good utilization of resources in producing goods or services (Hasibuan, 2015: 128).

From the above understanding it can be understood that a productive person describes the potential, perception and creativity of a person who always wants to contribute his abilities to benefit himself and his environment. So a productive person is a person who can make a real and meaningful contribution to the surrounding environment, is imaginative and innovative in approaching his life's problems and has intelligence (creative) in achieving his life goals. At the same time, such a person is always responsible and responsive in

relation to other people (leadership). Employees like this are organizational assets, who are always trying to improve themselves in their organization, and will support the achievement of organizational productivity goals.

METHOD

Based on the mapping of the problems faced by UKM Do Do Handycraft and Liong Su Handycraft, the approach and application of science and technology can be described which is the solution to the partner's priority problem. Most of the same activities are carried out at Do Do Handicraft and Liong Su. The description is as follows.

a) Handing over and assisting the use of the means of production in both partners.
b) Calculate productivity based on the number of units produced in a certain time based on product type

RESULTS

Progress on the Community Partnership Program is that it has provided several means of production. The equipment used for production is a cutting machine, drilling machine, compressor and nail gun. The actual production process requires a machine with a larger capacity. The cutting machine that has been used so far is still in a small capacity so that it is difficult for partners to cut large logs, so the process of cutting large logs is done manually. The drill machine used is also still a small drill machine so partners find it very difficult to drill large holes in wood. The compressor machine used is also obsolete and sometimes cannot operate anymore so work is temporarily postponed to repair the compressor engine. The tools that have been provided to partners are as follows.

1) Procurement of Compressor Machines
The compressor engine is used to provide wind power to the nail gun machine. The machines that partners have used so far use small cylinders so that they are not sufficient to support production capacity. This small tube makes the dynamo engine hot and the engine breaks down quickly. As a result of these problems, the service team relied on a compressor engine with a larger capacity so that it could provide support for partners' work needs.

2) Procurement of Drilling Machine sitting
The sitting drill machine is used to make holes in wood or sea shells which will be connected to wood or other materials using threads. Usually, craftsmen will combine wood with stones or sea shells. So far, the partner only has one sitting drill, which has started to break down. This causes partners to be overwhelmed when there are many orders. Therefore, the service team held different sized drill bits, namely 12mm drill bit and 16mm drill bit according to production needs.

3) Procurement of hand grinding machines
Grinding machines are usually used to cut small pieces of wood that cannot be reached by larger cutting tools. This machine is also used to cut the tips of nails that penetrate the wood surface. Currently partners have grinding machines that are getting old so they cannot meet production capacity. From these problems, the service team provided grinding machines to partners.

4) Procurement of Circular Saw Cutting Machines
The scroll saw machine is used as the scroll saw machine allows the user to cut very intricate and detailed patterns, including curved shapes, sharp corners, and fine details. This makes it ideal for making wood art, jigsaw puzzles, wall hangings and other interior decorations. This machine is really needed by partners because wood carving is usually done in large quantities. Currently partners have machines that are obsolete, making it difficult for partners to work efficiently so the service team provides a scroll saw machine to increase partner productivity.

5) Procurement of Table Saw Machines
Table Saw is a wood cutting tool used to cut wood or other materials with high precision. This tool is a type of table saw that has a large circular blade that emerges from the surface of the table, allowing the miter to saw materials in a more stable and accurate manner than a typical hand saw or circular saw. So far, partners

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use wooden tables that they made themselves, so the level of precision is not too high, which causes a lot of materials to be wasted, and the results do not match the desired shape. Therefore, the dedication team will holdtable saw to increase work effectiveness.

6) The Forstner Drill

The Forstner Drill Bit is a special type of drill bit that is used to make holes with a larger diameter and smoother results compared to conventional drill bits. This drill is usually used by Do Do Handycrat to make holes for wooden stands. Judging from the picture, the old drill blade has started to wear out, making it less efficient in making smooth holes. From this, the service team provided drill bits according to the designation.

Measurement of partner productivity is measured by comparative analysis, which compares the productivity of workers using old equipment with productivity measured using new equipment.

3.1 Productivity of Do Do Handicraft Partners

Partner productivity is measured by the number of products produced using the new equipment. The goods produced by Do Do Handicraft tend to be small, so the most activities carried out are cutting, carving, and painting. The calculation of labour costs is a piecework system or payment is made according to the number of items worked on. So, the calculation of productivity is the quantity divided by the time required to produce goods. Due to the many types of goods owned, the samples are five types of goods that are often produced, namely Dodo Birds, wooden renteng ornaments, Christmas trees, fish statues. The calculation of the productivity of one worker is as follows.

Table 1
Productivity with old equipment

Product	Wood cutting and shaping process (hour)	Stiffening process (hour)	Sandpaper process (hour)	Painting process (hour)	Total Time (hour)	Total production (PCS)	productivity (Unit/hour)
Burung Do Do	2	0	2	5	9,00	10	1,111
Pohon Natal	5	1		0	6	10	1,667
Hiasan Renteng kayu	3	0,5	3	5	11,5	10	0,870
Patung Ikan	5	0	3	5	13	10	0,769
Sarang Burung	5	2			7	10	1,429
Average							**1,169**

Table 2
Productivity with New Equipment

Product	Wood cutting and shaping process (hour)	Stiffening process (hour)	Sandpaper process (hour)	Painting process (jam)	Total Time (jam)	Total production (PCS)	productivity (Unit/hour)
Burung Do Do	1	0	2	3	6	10	1,667
Pohon Natal	3	1	0	0	4	10	2,500
Hiasan Renteng kayu	4	0	1,5	3	8,5	10	1,176
Patung Ikan	3	0	1,5	3	7,5	10	1,333
Sarang Burung	3	1	0	0	4	10	2,500
Average							**1,835**

Table 3
The Productivity Change Rate

No	productivity (Unit/Hour) (Before)	productivity (Unit/Hour) (After)	Productivity improvement (%)
1	1,111	1,667	50,00
2	1,667	2,500	50,00
3	0,870	1,176	35,29
4	0,769	1,333	73,33
5	1,429	2,500	75,00
Average	**1,169**	**1,835**	**56,725**

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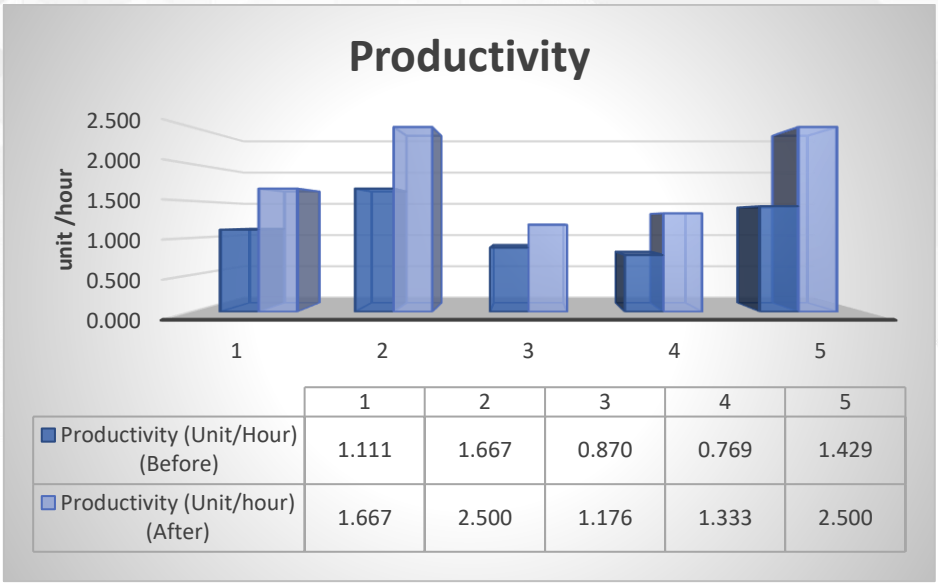

	1	2	3	4	5
Productivity (Unit/Hour) (Before)	1.111	1.667	0.870	0.769	1.429
Productivity (Unit/hour) (After)	1.667	2.500	1.176	1.333	2.500

Figure 1. Productivity Change Rate of Do Do Handicraft Partners

From Table 1.1. it is stated that the work productivity of a craftsman at Do Do Handicraft to work on one product using the old equipment is an average of 1,169 units / hour, while after using the new equipment it rises to an average of 1,835 units per hour. Therefore, the use of new equipment can increase the productivity of an average worker by 56.73 percent**.**

3.2 Productivity of Liong Su Handicraft

Just like Do Do Handicraft, the productivity generated by the old equipment will be compared to the productivity with the new equipment. Due to the number or types of Liong Su products, six types of products that are often produced by Liong Su will be sampled based on their size. The calculation of the productivity of one worker is as follows.

Tabel 4
Productivity with old equipment

Product	Iron frame making process (hour	Wood cutting and shaping process (hour)	Stiffening process (hour)	Nail sanding process (hour)	Painting process (hour)	Total Time (hour)	Production quantity (PCS)	productivity (Unit/hour)
Medium Product		120			5	125	100	0,800
Small Product		8			5	13	20	1,538
Small Glass products	5	8	12	12		37	5	0,135
large glass Product	1	10	15	8		34	5	0,147
large bull horn	1	20	15			36	5	0,139
large bull horn	8	50	60			118	1	0,008
Average								**0,461**

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Table 5
Productivity with New Equipment

Product	Iron frame making process (hour	Wood cutting and shaping process (hour)	Stiffening process (hour)	Nail sanding process (hour)	Painting process (hour)	Total Time	Production quantity	productivity (Unit/hour)
					(jam)	(jam)	(PCS)	
Medium Product		80			3	83	100	1,205
Small Product		5			3	8	20	2,500
Small Glass products	3	7	6	10		26	5	0,192
large glass Product	1	8	6	10		25	5	0,200
large bull horn	1	12	8			21	5	0,238
large bull horn	5	40	45			90	1	0,011
Average								0,724

Table 6
The Productivity Change Rate

No	productivity (Unit/Hour) (Before)	productivity (Unit/Hour) (After)	Productivity improvement (%)
1	0,800	1,205	33,60
2	1,538	2,500	38,46
3	0,135	0,192	29,73
4	0,147	0,200	26,47
5	0,139	0,238	41,67
6	0,008	0,011	23,73
Rata-rata	**0,461**	**0,724**	**32,28**

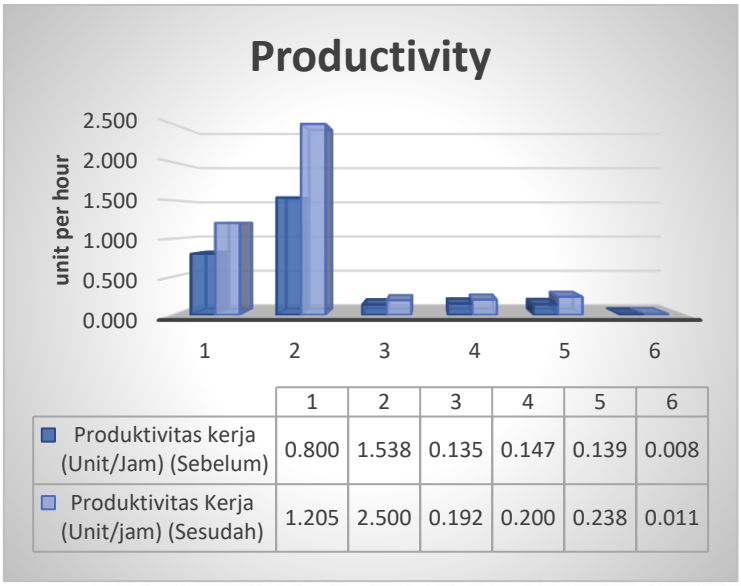

Figure 2. Productivity Change Rate of Liong Su Handicraft

CONCLUSION

In accordance with the results of productivity calculations, the technology is very instrumental in efforts to improve productivity. Renewal of equipment in production can increase productivity at Do Do Handycraft is 56.73 percent, while in Liong Su by 32.38 percent. The technology used also requires expertise in using it so that it can maximize production capacity.

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