ABSTRACT

Productivity can increasing through eliminating waste, with a low cost, the company can reduce selling prices which will further increase market opportunities. Waste identification itself is a tool used to achieve lean industries, also known as lean manufacturing. This requires knowledge and skills in identifying and eliminating waste for management and employees in the Kembangan sub-district. Green manufacturing is a method in manufacturing to minimize/eliminate waste and pollution through product and process design with the main objective being sustainable. This service activity aims to provide knowledge, understanding and skill of the eliminate waste in small industry. Seven wastes are transportation, inventory, motion, waiting, over processing, over production and delay. The results of the evaluation showed that all participants (100%) agreed with questions 1) Does the webinar material provide insight? 2) Does the webinar material increase knowledge? 3) Does the webinar material increase understanding in identifying waste in business activities, 4) Does the webinar material help overcome the problem of waste in business activities? 5) Do webinars need to be held on an ongoing basis? While in the implementation time, 28 people agree that the implementation time needs to be extended and 21 people think that the implementation time does not need to be extended.

Keywords: Lean Manufacturing, Green Manufacturing, Kembangan-West Jakarta.
2. METHOD
Providing understanding to SMIs about the importance of identifying and reducing waste in production activities to develop and advance SMIs. Implementation is carried out for one day by WEBINAR online zoom meeting. The duration of the activity consists of 3-4 hours. The audience owner of SMIs that located in North Kembangan, Kembangan sub-district, West Jakarta.

After the implementation of the development activities, the service team will evaluate whether the SMIs have been able to identify what their waste is included in the 7 types of waste and where it came from? Or is SMIs able to eliminate the waste? Then the implementation team will make a return visit to the partner location to see the effectiveness of the assistance activities.

3. RESULT AND DISCUSSION
Community service activities through the PPM Series webinar with the theme Industry and Environmental Conservation with the title Waste Elimination to Increase Productivity in Small Medium Industries Kembangan West Jakarta were held online on January 27, 2021. This activity was attended by the Head of the Village and the people of North Kembangan administrators and members of the North Kembangan PKK, administrators and members of the North Kembangan Youth Organization and the North Kembangan Community who have Small and Medium Industries.

This community service activity is a collaboration with the Sultan Idris Education University of Malaysia, in this case represented by Prof. Dr. Assoc. Che Zalina Zulkifli who gave material about community service activities in Malaysia in the field of environmental management.

This activity went well and smoothly. This can be seen from the timeliness of the implementation and the enthusiasm of the participants in question and answer and discussion. The question asked by the participants about lean manufacturing materials was how it applies to home industries. The concept of lean manufacturing is a concept that is easy to implement, but requires consistency in improving / reducing waste on an ongoing basis.

Lean manufacturing is one of the concepts that can increase efficiency through eliminating waste. Waste consists of: Transportation, Inventory, Motion, Waiting, Over Processing, Over Production, Defect (TIMWOOD).

Transportation (T). Poor plant design can cause waste in transportation. It can also trigger other wastes such as waiting or motion and impact overhead costs such as higher fuel and energy costs and higher overhead labor in the form of lift drivers as well as adding wear and tear on equipment. It may also result from poorly designed processes or processes that have not been changed or updated as often as required. Value stream mapping and partial or full changes in factory layout can reduce transportation waste. This is a full documentation of all aspects of the production flow and not just the mapping of a specific production process. This results in changes to reduce or eliminate transportation waste. Common types of Transportation Waste: Poor layouts – large distance between operations, Long material handling systems, Large Batch sizes, Multiple storage facilities, Poorly design production systems.

Inventory (I), Inventory is considered a form of waste because of the related holding costs. This is true of raw materials, WIP and finished goods. Over purchasing or poor forecasting and planning can lead to inventory waste. It may also signal a broken or poorly designed process link between manufacturing and purchasing/scheduling. Lean Manufacturing does not just focus on the factory but also requires process optimization and communication between support functions. Purchasing, scheduling and
forecasting can have a version of standardized work in the form of defined minimums and maximums and order points that are mapped to the process flow and takt time. Purchasing raw materials only when needed and reducing WIP and eliminating or narrowing the definition of “safety stock” will reduce this type of waste. Common causes of Inventory Waste include: Overproduction of goods, Delays in production or ‘waste of waiting’, Inventory defects, Excessive transportation.

Over Processing (O). Over processing is a sign of a poorly designed process. This could be related to management or administrative issues such as lack of communication, duplication of data, overlapping areas of authority and human error. It may also be the result of equipment design, inadequate job station tooling or facility layout. Process mapping is a lean waste elimination tool that helps define an optimized workflow that can eliminate over processing. As a key method within Lean production, process mapping is not limited to the performance of production tasks. It also includes reporting, signoff and document control. Examples of Over Processing include: Poor communication, Not understanding, your customers’ needs, Human error, Slow approval process or excessive reporting.

Over Production (P). When components are produced before they are required by the next downstream process, overproduction occurs. This has several negative effects. It creates a “caterpillar” effect in the production flow and results in the creation of excess WIP. This leads to staging and therefore labor required to move the WIP additional times. And it can hide defects that could have been caught with less scrap if processes were balanced to allow detection earlier as earlier use of the WIP components would have revealed the defect in time to correct the issue. Lean manufacturing systems utilize several tools to combat overproduction. Takt time is used to balance production rates between cells or departments. Measured and process-mapped jobs result in reduced setup time allowing efficient small batch flow. And in many industries, “pull” systems such as Kanban can be used to help control or eliminate WIP. Common causes of Overproduction include: Unreliable process, Unstable production schedules, Inaccurate forecast and demand information, Customer needs are not clear, Poor automation, Long or delayed set-up times.

Defect (D). Defects impact time, money, resources and customer satisfaction. Examples of Defects within a manufacturing environment include lack of proper documentation or standards, large variances in inventory, poor design and related design documentation changes and an overall lack of proper quality control throughout the process workflow. Formalized document control and design change documentation, thorough and documented quality methods in all production phases and checklists that have been audited to ensure proper adherence to the BOM are effective ways to control defect waste. And standardized work at each production cell or point in the production line will help reduce this type of waste as well. Specific Defect causes include: Poor quality control at the production level, Poor machine repair, Lack of proper documentation, Lack of process standards, Not understanding your customers’ needs, Inaccurate inventory levels.

The evaluation of this community service activity was carried out by giving an evaluation questionnaire to
the 49 participants after the activity ended. The questions on the questionnaire are: 1) Does the webinar material provide insight? 2) Does the webinar material increase knowledge?, 3) Does the webinar material increase understanding in identifying waste in business activities, 4) Does the webinar material help overcome the problem of waste in business activities?, 5) Do webinars need to be held on an ongoing basis?, 6) Does the time for the webinar need to be extended?

Figure 4. Result of the evaluation community service activity

The results of the evaluation showed that all participants (100%) agreed with questions number 1 to question number 5. While in question no. 6 regarding the implementation time, 28 people agree that the implementation time needs to be extended and 21 people think that the implementation time does not need to be extended.

CONCLUSIONS

The service was carried out well and received a positive response from the participants. Lean manufacturing training activities can increase participants’ understanding to improve work efficiency. This activity was greatly appreciated by the participants, because it was hoped that with this activity could increase efficiency. Most participants hoped for continued activities because there was not enough time available. The activity organizing team was asked to guide further implementation of the lean concept.

REFERENCES

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