

LEAN PROCESS AFFECTING LOSS AND WASTEFUL TO PRODUCTS COST REDUCTION OF THAI'S COMMUNITY ENTERPRISES

**Kasama Kasorn¹, Suphamon Duangta², Panchat Akarak³, Nirut Chaichok⁴,
Pheerapol Sriwichai⁵, and Pornchai Jedaman⁶**

^{1, 2, 3, 4, 5}Chiang Rai Rajabhat University,

⁶Rajabhat Mahasarakham University, Thailand.

E- mail; p.jedaman@gmail.com.

Abstract:- Cost reduction through lean process it's effectively reduces the loss and wasteful of operations in the community enterprise. This is analyzed the factors of lean process affecting loss and wasteful to products cost reduction in Thai's community enterprises. Mixed method study on qualitative to synthesizing the documentary and by interview questionnaire into the factors of lean process and impacts a used of lean process affecting loss and wasteful to products cost reduction, on quantitative to survey by questionnaire to casual factors of lean process affecting loss and wasteful to products cost reduction. Lean process of value destination, value stream management, flow, pull, perfection. Casual factors to lean process have to direct and indirect influences at statistical significance. Impacts a used of lean process affecting loss and wasteful to products cost reduction of business management, production management, and marketing management in Thai's community enterprises.

Keywords:- Lean process, loss and wasteful, products cost reduction, community enterprises.

1. Introduction

One of the most commonly talked about manufacturing approach in the sector for almost past three decades is the lean approach despite the disputation on the approach uniqueness in comparison with other alternate manufacturing approaches. At the present, the livelihood of Thai people has faced the problem of poverty, selling community products that make income insufficient for expenses, the unemployment crisis of people in the community has increased. It is essential that government agencies turn to help, by promoting occupations other than the main ones of the people from the career creation project to promote income to develop the community economy through one product and one community project regarded as a project develop the grassroots economy to lead to national economic development that induces the intensity of people in the community to be able to be self-reliant in a sustainable way [1]. A raising the standard of living with better living and the production of products in the community for community enterprise entrepreneurs. Most of them have had problems with marketing and high product costs, factors and requirements that still can't really find a solution, e.g., setting the selling price must depend on the market price, raw materials for some types of production. has been determined by the market price [2]. However, the determination of selling prices and raw material costs is based on highly competitive market mechanisms. Strategies to reduce product costs are therefore important and appropriate cost reduction promotion should be implemented. A community enterprise is a community enterprise of producing goods, providing services, operated by a group of people who share a common life, and forming a business entity. To generate income and for self-reliance of families, communities, and between communities.

Lean manufacturing is a production system to reduce costs, focusing on eliminating unnecessary operational disruptions, by maintaining an uninterrupted flow of goods, and use the just in time production system to produce only what is necessary in terms of quantity and time of production operations. Lean manufacturing system is a good production system, focusing on eliminating waste in various activities that can reduce costs, reduce wastage, and reduce the loss of production opportunities [3]. It is the production of a product with minimal use of everything in the manufacturing process, as compared to a mass production system. Reducing wastage in a lean manufacturing process is another way to reduce the cost of the product, because cost reduction with lean processes reduces wastage and waste, which affects operational efficiency of business, both monetary and non-monetary [4]. Lean system is an ideal system for factory operations to help reduce wastage, and convert wastage into value that leads to successful community business production management, process Efficient production that can manage costs better. The application of lean to the production process is widely accepted as a truly efficient system [5]. By optimizing work efficiency by reducing non-value, and waste to deal with the wastage of the production process, turning waste into value, increasing production opportunities, and the results in increased profitability [6]. Lean cost reduction is the reduction of waste in the manufacturing process in the factory that increase profits. This is to analyzed the lean process affecting loss and wasteful to products cost reduction in Thai's community enterprises, also, in the objectives have three mains this study aims to follows:

- a) To analyzed the factors of lean process affecting loss and wasteful to products cost reduction in Thai's community enterprises.
- b) To study the casual factors to lean process affecting loss and wasteful to products cost reduction in Thai's community enterprises.
- c) To study the impacts a used of lean process affecting loss and wasteful to products cost reduction in Thai's community enterprises.

2. Literature Reviews and Research Frameworks

2.1 Significance lean process to products cost reduction in Thai's community enterprises.

Lean system is the optimization of work related to dealing with waste occurring in the production process, turning waste into value. and increase production opportunities resulting in increased profitability. Lean thinking is a concept that is used as a tool to improve processes to be more efficient, lean in manufacturing is intended to manage processes with a focus on eliminating process waste so that processes are efficient in order to reduce costs to incurred by inefficient processes of create value to the business. Lean system for eliminating waste [7] to consists of; i) loss due to overproduction by production process in the factory there was one thing that caused the loss is the belief to many productions as possible must be produced it is pre-production that causes overproduction, resulting in loss of production costs per unit resulting from the large number of jobs. Problems caused by overproduction are labor losses, partial output losses caused by spoilage, as well as, overuse of resources, which can be improved by reducing production capacity. less to correspond with the amount of output to the market will reduce the losses incurred to achieve optimum yield, ii) inventory losses resulting from planned bulk material purchases lead to more material in the warehouse than necessary, and waste. However, specifying a clear storage quantity, and making a purchasing system plan that corresponds to production, including, using first in first out to effectively reduce the amount of residual material

for a long time, iii) losses due to transportation caused by distances that are not necessary will cause costs in terms of fuel, labor, equipment maintenance costs. Improving by studying the transport routes well for the shortest distance, and managing the arrangement of the machines appropriately to save cost, iv) losses due to corresponding movements of labor in the production process resulting in delays. Therefore, the placement of things and tools to use in various production to be close together, layout within the factory to suit the work process, v) losses due to manufacturing processes in factories that result in duplicate work, and multiple steps can cause losses, including, causing unnecessary cost problems and resulted in delayed work [8]. Improving by using the principles of functional analysis and management to appropriately, vi) loss due to waiting caused by machine downtime, or employees affecting production is the wasted cost of labor and machine, which does not create value added resulting in opportunity cost. The order of production is good, and the allocation of labor is balanced in production, there is enough labor to replace, including, training work skills for workers to support replacement work, vii) losses due to production waste that waste production, because, must be reproduced, or simply disposed of, are redundant, creating opportunity costs. Improving production standards to reduce waste rates, improving the way employees work in the production process [9]. Lean thinking is being used more and more in business today. Both the manufacturing industry and the service sector, with the objective of being used so that the business sector can adapt and create more competitive advantage [10]. Lean process to products cost reduction in Thai's community enterprises is adding value to products and services, focusing on eliminating waste in the process will result in community enterprises to reduce costs, leading to standardized works, is increase efficiency and competitiveness of value destination, value stream management, flow, pull, and perfection [11]. Applying lean techniques to the production process It is a guide to develop and improve overall performance. with important principles consisting of value destination, value stream management, flow, pull, and perfection [12]. Reducing the wastes that occur within the Thai's community enterprises, is therefore necessary, and very important, because, the wastes that occur within this sector will result in increased costs, if it can be reduced [13]. The resulting waste will reduce production costs, including eliminate, combine in the work process, rearrange to make it easier to work and reduce work steps, simplify to make work more convenient, fast and accurate [14]. Applying lean concepts include value destination, value stream management, flow, pull, and perfection in work processes can reduce time, and increase work efficiency. This is analyzed lean process among the key factors are to value destination, value stream management, flow, pull, and perfection affecting loss and wasteful to products cost reduction in Thai's community enterprises, in addition, it helps to work without errors, and can effectively reduce the loss caused by the work process of Thai's community enterprises.

2.2 Research frameworks.

Lean process affecting loss and wasteful to products cost reduction in Thai's community enterprises into research frameworks were followed:

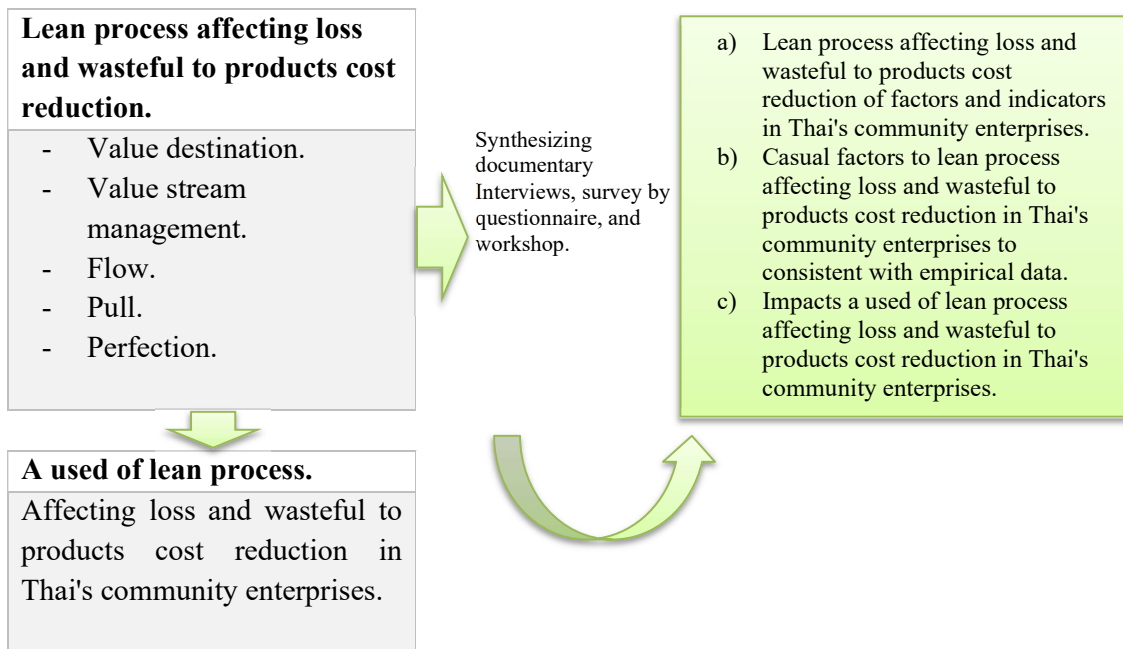


Fig. 1. Research frameworks of lean process affecting loss and wasteful to products cost reduction in Thai's community enterprises.

3. Methodology

A mixed method research both to participatory action research throughout the qualitative study by documentary reviews, interview to study the factors of lean process on value destination, value stream management, flow, pull, perfection affecting loss and wasteful to products cost reduction, and the workshop to study the impacts a used of lean process affecting loss and wasteful to products cost reduction in Thai's community enterprises. On quantitative to observation by questionnaire to study the casual factors to lean process affecting loss and wasteful to products cost reduction in Thai's community enterprises into research methodology.

3.1 The participants of key informants to interviews, and workshop were chairman's community enterprises, community enterprise members, and community product groups in Chiang Rai Province, Thailand, totals of 100 people with the criteria for selecting key informants who are involved in business operations in community enterprises and participating in activities, they all were by purposive sampling and focus groups, and the samples to observation were chairman's community enterprises, community enterprise members, community product groups, and general public in the communities totals of 450 people, they all were multistage random sampling.

3.2 Research tools were to, 1) the interview questionnaire to factors of lean process affecting loss and wasteful to products cost reduction as structure interview with the theme of the interview to study the indicators. What should be the factors of lean process on affecting loss and wasteful to products cost reduction affecting loss and wasteful to products cost reduction in Thai's community enterprises to indicators a look like? The interview has item of objective congruence:

IOC, by five experts to assessment between 0.80 - 1.00, 2) the questionnaire to casual factors to lean process affecting loss and wasteful to products cost reduction as semi- structure questionnaire of 5- rating scales with the confidence value of the questionnaire from try- out of 0.87, and 3) the interview questionnaire to impacts a used of lean process affecting loss and wasteful to products cost reduction as structure interview with the theme of the interview to study the impacts. How are to the impacts a used of lean process affecting loss and wasteful to products cost reduction in Thai's community enterprises? The interview has item of objective congruence: IOC, by five experts to assessment between 0.80 - 1.00, respective.

3.3 Data collection to the respondents in study and understanding of lean process conceptual came from documentary reviews and related research to develop conceptual frameworks. Conduct in-depth interviews. To obtain deep and broad information by interview questionnaire to factors of lean process affecting loss and wasteful to products cost reduction with 100 key informants to collected and analyzed as factors of lean process affecting loss and wasteful to products cost reduction of indicators, that the qualitative study. To survey by the questionnaire to casual factors to lean process affecting loss and wasteful to products cost reduction with 450 samples to verify the coherence of the causal model in five factors including value destination, value stream management, flow, pull, perfection, by analyzing the model measure, and structural equation model to collected and analyzed as casual factor to lean process affecting loss and wasteful to products cost reduction to consistent with empirical data, that the quantitative study. Knowledge transfer of lean process implementation from workshop with 100 key informants, and after completion of implementation, interview with project participants by interview questionnaire to impacts a used of lean process affecting loss and wasteful to products cost reduction to collected and analyzed as impacts a used of lean process affecting loss and wasteful to products cost reduction in Thai's community enterprises, that the qualitative study to the data.

3.4 Data analysis on qualitative data was analyzed by using three main stages, e.g., data reduction, data organization, data interpretation to conclusion. On quantitative data was analyzed by descriptive statistically analysis including mean, standard deviation, model analysis to measurement model, and structural equation model: SEM to check according to the conceptual framework and checking for consistency with empirical data by computer program.

4. The Results

Results to lean process affecting loss and wasteful to products cost reduction in Thai's community enterprises were followed:

4.1 Results to factors of lean process into indicators affecting loss and wasteful to products cost reduction.

Factors of lean process into indicators affecting loss and wasteful to products cost reduction in Thai's community enterprises were followed:

i) Value destination:- Focus on eliminating waste, reducing process costs that do not generate value, satisfying customers, defining the manufacturing of process, creating value and product capability.

ii) Value stream management:- Functional process of producing value-added products,

eliminating non-value-added elements in the production process, defining activities and operations to products, managing and consolidating functional relationships and operations together.

iii) Flow:- Implementation of supporting activities of the product, creating agility, speed and continuity, eliminating obstacles, managing the work-related timelines, storing and having tools available.

iv) Pull:- Producing enough products to meet customer needs, just in time the production systems, balancing production and relations with required production quantities to reduce wastage.

v) Perfection:- Achievements caused by efficient work, time, space, cost reduction and mistakes that occur in the work process, understanding of product design and process to add value to customers, continuous structuring in the production process to achieve zero inventory, perfection in maximizing product value and continuously improving the production.

4.2 Results to casual factors to lean process affecting loss and wasteful to products cost reduction in Thai's community enterprises.

Casual factors to lean process on value destination (VD), value stream management (VS), flow (FL), pull (PU), perfection (PE) of affecting loss and wasteful to products cost reduction in Thai's community enterprises were followed

1) Lean process on value destination (VD), value stream management (VS), flow (FL), pull (PU), perfection (PE) of affecting loss and wasteful to products cost reduction in Thai's community enterprises to found at level of all 5 variables to high levels, by value destination (VD) in aspect with the highest mean of reducing process costs that do not generate value (VD₂) (Mean of 4.16, Std. of 0.72), the aspect with the lowest mean of satisfying customers (VD₃) (Mean of 3.84, Std. of 0.82), value stream management (VS) in aspect with the highest mean of managing and consolidating functional relationships and operations together (VS₄) (Mean of 4.22, Std. of 0.52), the aspect with the lowest mean of functional process of producing value-added products (VS₁) (Mean of 3.72, Std. of 0.80), flow (FL) in aspect with the highest mean of eliminating obstacles (FL₄) (Mean of 4.29, Std. of 0.60), the aspect with the lowest mean of managing the work-related timelines (FL₅) (Mean of 3.98, Std. of 0.72), pull (PU) in aspect with the highest mean of balancing production and relations with required production quantities to reduce wastage (PU₃) (Mean of 4.41, Std. of 0.53), the aspect with the lowest mean of just in time the production systems. (PU₂) (Mean of 4.32, Std. of 0.59), perfection (PE) in aspect with the highest mean of perfection in maximizing product value and continuously improving the production (PE₅) (Mean of 4.44, Std. of 0.56), the aspect with the lowest mean of understanding of product design and process to add value to customers (PE₃) (Mean of 4.17, Std. of 0.55), respective. In this way the skewness, the data were negative between -0.11 to -1.23, indicating to respondents had a higher than average opinion of the levels of each variable, kurtosis, it was between -0.60 to 2.05 (less than, 3), the indicates the data to less curved distribution, and the distribution of data is large to shown as table 1.

Table 1. Mean, standard deviation, skewness, kurtosis of 5 variables used in lean process.

Variables	Mean	Std	Skewness	Kurtosis	Variance
Value destination (VD).					
1. Focus on eliminating waste (VD ₁)	4.08	0.7	-1.06	2.05	0.44
2. Reducing process costs that do not generate value (VD ₂)	4.16	0.7	-0.95	1.76	0.51
3. Satisfying customers (VD ₃)	3.87	0.7	-0.71	1.14	0.52
4. Defining the manufacturing of process (VD ₄)	4.02	0.7	-0.72	1.3	0.48
5. Creating value and product capability (VD ₅)	4.02	0.8	-0.61	0.49	0.68
Value stream management (VS).					
6. Functional process of producing value-added products. (VS ₁)	3.72	0.8	-0.45	0.1	0.65
7. Eliminating non-value-added elements in the production process (VS ₂)	3.74	0.8	-0.37	0.31	0.43
8. Defining activities and operations to products (VS ₃)	4.2	0.6	-0.65	0.68	0.36
9. Managing and consolidating functional relationships and operations together. (VS ₄)	4.22	0.5	-0.41	-0.14	0.27
Flow (FL).					
10. Implementation of supporting activities of the product (FL ₁)	4.23	0.6	-0.33	-0.21	0.34
11. Creating agility (FL ₂)	4.12	0.7	-0.23	-0.43	0.29
12. Speed and continuity (FL ₃)	4.15	0.6	-0.3	-0.29	0.39
13. Eliminating obstacles. (FL ₄)	4.29	0.6	-0.59	0.35	0.36
14. Managing the work-related timelines (FL ₅)	3.98	0.7	-0.47	-0.04	0.52
15. Storing and having tools available (FL ₆)	4.2	0.6	-0.25	-0.51	0.34
Pull (PU).					
16. Producing enough products to meet customer needs (PU ₁)	4.4	0.6	-0.37	-0.7	0.3
17. Just in time the production systems (PU ₂)	4.32	0.6	-0.38	-0.46	0.34
18. Balancing production and relations with required production quantities to reduce wastage (PU ₃)	4.41	0.5	-0.37	-0.61	0.28
Perfection (PE).					
19. Achievements caused by efficient work (PE ₁)	4.24	0.5	-0.11	-0.55	0.24
20. Time, space, cost reduction and mistakes that occur in the work process (PE ₂)	4.25	0.5	-0.17	-0.58	0.29

21. Understanding of product design and process to add value to customers (PE ₃)	4.17	0.6	-0.11	-0.53	0.3
22. Continuous structuring in the production process to achieve zero inventory (PE ₄)	4.31	0.6	-0.37	-0.4	0.31
23. Perfection in maximizing product value and continuously improving the production (PE ₅)	4.44	0.6	-0.58	-0.37	0.31

2) Development and validation to consistency and harmony of casual factors to lean process on value destination (VD), value stream management (VS), flow (FL), pull (PU), perfection (PE) of affecting loss and wasteful to products cost reduction in Thai's community enterprises to found that to concordance with the empirical data, a considering the concordance index that passed the acceptance criteria into Chi- square/df of 1.73 has to less than 2, GFI of 0.96, RMR of 0.034 to less than 0.90, and RMSEA of 0.04 to less than 0.05, by flow (FL) positively influenced by value destination (VD) of 0.57, pull (PU) positively influenced by value stream management (VS) of 0.50 , include perfection (PE) was positively influenced by value destination (VD) of 0.22, and was negatively influenced by value stream management (VS) of -0.56, and perfection (PE) to indirectly influenced by the value destination (VD) and value stream management (VS) of 0.48, 0.37, respectively, which were to significant of 0.05 levels to shown as figure 2, and table 2.

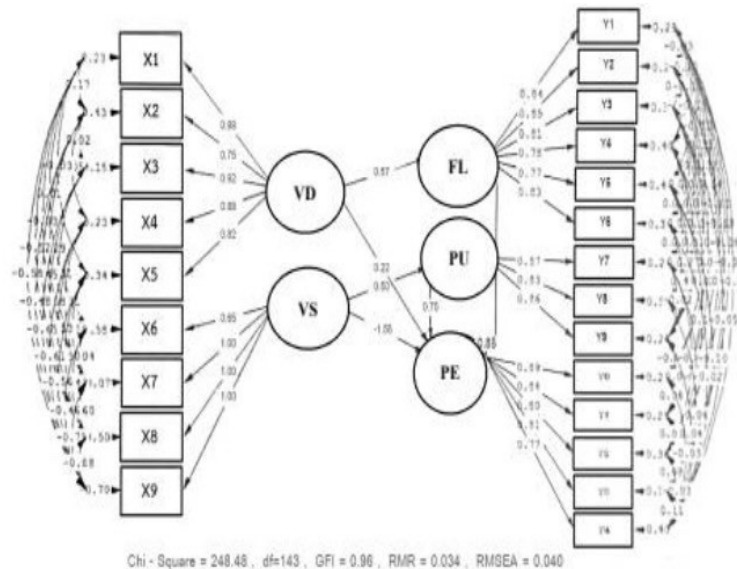


Fig. 2. Model to casual factors to lean process affecting loss and wasteful to products cost reduction in Thai's community enterprises.

Table 2. Influences to casual factors to lean process affecting loss and wasteful to products cost reduction in Thai's community enterprises into five variables.

Internal Variables	R ²	Influences	External Variable	
			Value Destination (VD)	Value Stream Management (VS)
Flow (FL)	0.33	DE	0.57*	-
		IE	-	-
		TE	0.57*	-
Pull (PU)	0.25	DE	-	0.50*
		IE	-	-
		TE	-	0.50*
Perfection (PE)	0.27	DE	0.22	0.56*
		IE	-	0.37*
		TE	0.22	0.19*

*P 0.05.

4.3 Results to impacts a used of lean process affecting loss and wasteful to products cost reduction in Thai's community enterprises.

The impacts a used of lean process affecting loss and wasteful to products cost reduction into business management, production management, and marketing management in Thai's community enterprises were followed:



- a) **Business management:-** Operational planning, product management, assignment of roles and responsibilities of according to competency and operational skills that enable effective operation, quality adjustment and market growth. In accordance with the production capacity of the business, inventory management, for example, with a record of incoming and outgoing goods. of inventory, collect of disbursements from sales and orders in order to have enough products and meet the needs of consumers.
- b) **Production management:-** Having a good production process and planning and controlling the purchase of goods, preparing a budget for purchasing goods, using small machines and technology in production, employing local labor to help in production, by allocating work duties according to individual abilities, able to supervise and control production very well, determine production at an appropriate level according to consumer needs, procurement of raw materials in production with organized quantities to sufficient storage, the production of according to customer orders.

Fig.3. Lean process affecting loss and wasteful to products cost reduction of bamboo weaving group, palm leaf hat weaving group, women's skill development weaving group, agricultural product processing group in Thai's community enterprises.

c) **Marketing management:-** Having a regular store and selling by order, continuous display of products at OTOP fairs, direct public relations, by means of distribution and public relations from customer groups, focusing on wholesale and retail, having a brand of their own to be remembered by consumers, and indirectly from the distribution of products through social media. That is a marketing channel to reduce wastage in excessive production, when customers come to order products, there will be an average job. Therefore able to produce products according to the number and keep up with the needs of customers, with pre-produced products in modest amounts to use the lowest production costs and shortest production time to deliver the highest quality products and services.

5. Discussion

Lean process including value destination, value stream management, flow, pull, and perfection. Casual factors to lean process have to direct and indirect influences at statistical significance affecting loss and wasteful to products cost reduction. Impacts a used of lean process affecting loss and wasteful to products cost reduction of business management, production management, and marketing management in Thai's community enterprises to effectiveness, because the lean system is the optimization of work related to dealing with waste occurring in the production process, turning waste into value and increase production opportunities resulting in increased profitability and a concept that is used as a tool to improve processes to be more efficient, lean in manufacturing is intended to manage processes with a focus on eliminating process waste so that processes are efficient in order to reduce costs to incurred by inefficient processes of create value to the business [15]. The achievements caused by efficient work, time, space, cost reduction and mistakes that occur in the work process, understanding of product design and process to add value to customers, continuous structuring in the production process to achieve zero inventory, perfection in maximizing product value and continuously improving the production [16]. However, the concept of production that considers wastes as the cause of the longer production time, lean production. Therefore, various techniques are applied to eliminate waste of the production process, minimize production costs, and shorten production time. to provide the highest quality products and services It consists of important techniques such as lead time, just in time, and value-added activities, including production processes, planning and controlling the production of high quality products [17]. Separation between what you need and what you don't need by eliminating what you don't need, tools and tools can be easily accessed by storing them in the right place [18]. It is a reduction in overproduction waste, reduction in inventory waste, reduction in waiting losses, reduction in movement waste, reduction in transport waste, reducing waste production waste, and reducing waste production processes for value and quality [19]. Elimination of waste from the production of waste, the problem of waste caused by production this wastes more resources than is necessary for waste disposal or reproduction. This is a duplicate operation that incurs opportunity costs, which can be adjusted by maintaining better production standards. Application of lean thinking, it was to the process wastes were reduced and operation time was decreased [20]. Value stream mapping is a tool proposed to determine activities in a value stream add value within and between a product transformation process and map an optimal value stream [21]. In this regards, the impacts a used of lean process affecting loss and wasteful to products cost reduction including bamboo weaving group, palm leaf hat weaving group, women's skill development weaving group, agricultural product processing group

into business management from operational planning, product management, assignment of roles and responsibilities of according to competency and operational skills that enable effective operation, quality adjustment and market growth, production management as having a good production process and planning and controlling the purchase of goods, preparing a budget for purchasing goods, using small machines and technology in production, marketing management of having a regular store and selling by order, continuous display of products at OTOP fairs, direct public relations, by means of distribution and public relations from customer groups, focusing on wholesale and retail, having a brand of their own to be remembered by consumers, and indirectly from the distribution of products through social media.

6. Conclusion

Lean process including value destination to focus on eliminating waste, reducing process costs that do not generate value, satisfying customers, defining the manufacturing of process, creating value and product capability, value stream management into functional process of producing value-added products, defining activities and operations to products, managing and consolidating functional relationships and operations together, flow from to Implementation of supporting activities of the product, creating agility, speed and continuity, eliminating obstacles, managing the work-related timelines, storing and having tools available, pull of producing enough products to meet customer needs, just in time the production systems, balancing production and relations with required production quantities to reduce wastage, and perfection as the achievements caused by efficient work, time, space, cost reduction and mistakes that occur in the work process, understanding of product design and process to add value to customers, continuous structuring in the production process to achieve zero inventory, perfection in maximizing product value and continuously improving the production. Casual factors to lean process of all factors of affecting loss and wasteful to products cost reduction in Thai's community enterprises have to direct and indirect influences to concordance with the empirical data to significant of 0.05 levels. Impacts a used of lean process affecting loss and wasteful to products cost reduction of business management as operational planning, product management, assignment of roles and responsibilities of according to competency and operational skills that enable effective operation, quality adjustment and market growth, production management a having a good production process and planning and controlling the purchase of goods, and marketing management a having a regular store and selling by order, continuous display of products at OTOP fairs, and shortest production time to deliver the highest quality products and services to effectiveness.

7. Implementation

Lean process of value destination, value stream management, flow, pull, and perfection to guide management in the process of developing a lean based enterprise and create a continuous journey towards waste elimination by working together and revisiting each activity in a value stream to identify opportunities for further improvements. The use of Lean in production management It is to increase the potential of the workforce, the use of technology to add value to employees, and to increase the overall value of the group, reducing waiting waste, reducing mobility waste, reducing waste. In the manufacturing process, therefore, operators should adopt flexibility in their work, e.g., not over-producing, reducing frequent handovers, not over-stocking, and reducing Redundant work procedures.

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