### ÁP DỤNG HỆ THỐNG 5S TẠI CÔNG TY TNHH ESQUEL GARMENT MANUFACTURING VIỆT NAM – ĐỒNG NAI

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### Tóm tắt

Trong bài báo này, thông qua trường hợp cụ thể của công ty TNHH Esquel Đồng Nai, khu vực phía Nam Việt Nam, các dữ liệu thống kê sơ cấp và thứ cấp được ghi nhận để đánh giá hiệu quả của hệ thống 5S mang lại cho tổ chức. Dữ liệu thứ cấp cho thông tin về thay đổi của một số chỉ số đánh giá hiệu quả hoạt động chính yếu theo thời gian; trong khi dữ liệu sơ cấp cung cấp đánh giá của ban giám đốc nhà máy, nhóm chuyên gia về Sản xuất Tinh Gọn đối với sự thay đổi điều kiện làm việc trước và sau khi áp dụng 5S thông qua phỏng vấn trực tiếp. Cụ thể, việc áp dụng 5S để cải thiện không gian làm việc, giảm lãng phí vật tư, tăng tỉ lệ xuất hàng và giảm chi phí vận hành được đánh giá chi tiết. Ngoài ra, trong khi thi hành, chu trình cải tiến liên tục PDCA được áp dụng song hành với 5S để duy trì và cải tiến quy trình thực thi cũng được xem xét. Sau cùng, bài viết này ngoài việc chia sẻ các kinh nghiệm vận hành 5S tại tổ chức Esquel Đồng Nai, nó còn tổng kết lại các yếu tố trọng yếu ảnh hưởng tới việc triển khai 5S thành công cho nhà máy. Các điểm mạnh, điểm yếu và kinh nghiệm rút ra sẽ là các bài học để các doanh nghiệp khác học hỏi và triển khai nhân rộng.

Từ khóa: Phương pháp 5S, Sản xuất tinh gọn, PDCA, Giảm lãng phí, Tối ưu hóa sản xuất.

# APPLYING 5S SYSTEM AT ESQUEL GARMENT MANUFACTURING VIETNAM – DONGNAI COMPANY LIMITED

Abstract

In this paper, via a particular case of a garment company, Esquel Ltd. in Dongnai - a southern province of Vietnam, a range of primary and secondary data was collected to assess the effectiveness of 5S implementation. Secondary data gives information about the situation before and after 5S by measuring changes in some key performance indicators (KPIs) over time, whereas primary data from face-to-face interviews gives us commentary assessment of top management and Lean experts about how 5S has changed working conditions of the company. The implementation of 5S to improve working conditions, reduce fabric wastage, increase shipment rates, and reduce operational costs has been evaluated. In addition, PDCA framework accompanied with the 5S method to sustain the daily activities and improve performance continuously is also examined. The article brings an insight of 5S application for Esquel Ltd. case and summarizes critical factors to successful implementation of 5S. Strengths, weaknesses and learned experiences will be lessons for other businesses to learn and replicate.

**Keywords:** 5S methodology, Lean manufacturing, PDCA, waste elimination, production optimization. JEL classification: M, M1.

# 1. Introduction

5S methodology is a Lean manufacturing tool to improve total effectiveness of an organization (Omogbai & Salonitis, 2017). Its origin can be traced back in Japan in 1990's (Osada, 1995). This system gets its name from 5 activities starting with S letter: Seiri, Seiton, Seiso, Seiketsu and Shitsuke. In the Western, 5S is translated into Sort, Set-inorder. Shine, Standardization and Sustain respectively. Sort is to remove unnecessary items, and only needed items are remained. Set-in-order is to set a proper item into a proper position for effective operation. Shine is to clean with inspection. Standardize means clear standard needs to be in place and easy for communication and understanding. Finally, sustain represents maintaining daily practice, auditing and making 5S a habit, then later integrating 5S into an organization culture. 5S is largely reported via a vast an amount of studies as a simple yet powerful tool (Gapp, Fisher, & Kobayashi, 2008) to eliminate waste (Dahl, 2018), reduce cost (Patel & Thakkar, 2014) and improve working conditions (Nurain & Rani, 2016). Toyota in Japan (Knechtges, Bell, & Nagy, 2013) and Boeing in the USA are two well-known cases that have successfully adopted 5S in their business.

Recently, there are a number of enterprises which have implemented 5S strategy to improve business performance in Vietnam. However, a little review of how effective 5S implementation has been reported. According to Phan Thi Uyen in 2015, it is around 1% successful rate for Vietnamese enterprise to implement 5S. Thus, it is important to have more scientific and systematic assessments of 5S in Vietnam to reinforce the belief on 5S theory for later widespread this ideology from one enterprise to others. Here, this research takes the situation of Esquel Ltd. company as a case study.

Esquel Ltd. is a manufacturing company, which produces 100% cotton garments for the USA, European and Asia market. From 2019 backward, this organization faced fundamental problems with high material wastage leading to low shipment rate to customers. Furthermore, the working conditions was poor and untidy: Garbage usually found on production floor, working space was full of unnecessary stuffs. As the inevitable consequence, air shipment to catch delivery and consumable cost was high. With regard to benefits that 5S practice could bring to business as recent literatures, this system accompanied with PDCA (Plan Do Check Action) implementation cycle has been introduced to this factory to improve business performances specifically for lowering waste, increasing shipment rate, reducing and improving working consumable cost, conditions. After eighteen months of execution, a detailed assessment of 5S implementation has been summarized here to give information about effectiveness of 5S. As presented data, all problems such as wastage, cost and working conditions were solved thoroughly via 5S program. The case of 5S in Esquel Ltd. finally could be served as the source of 5S implementation case study in Vietnam condition. All lessons learned such as strengths, weaknesses, influencing factors for 5S success were reported in detail. Finally, some suggestions were also included in this paper for further improvements.

# 2. Literature review

After World War II, 5S methodology was introduced to the world for the first time by Osada in 1989, 1991 and Hirano in 1995, 1996 (Kobayashi, 2008). 5S includes five steps, each step starts with letter S: Seiri, Seiton, Seiso, Seiketsu, Shitsuke which can be translated into English as Sort, Set in order, Shine, Standardize and Sustain. In detail, author Cristina in 2018 described as below:

Sort (Seiri): Removing what is not needed and clearing the workplace.

Set in Order (Seiton): Preparing the necessary items neatly and systematically so that they can easily be taken and returned in the original place after use

Shine (Seiso): Cleaning regularly equipment and workplace, identifying irregularities. Dust, dirt, and wastes are the source of untidiness, indiscipline, inefficiency, faulty production, and work accidents. Standardize (Seikutsu): Documenting and standardizing the method, using standard procedures. Standards should be very communicative, clear, and easy to understand.

Sustain (Shitsuke): Continuously maintaining established procedures, auditing work methods, making 5S a habit, integrating into culture.

5S origin can be traced back from Japan, it is widely understood in this country as a method of improving lifestyle (Osada, 1989). The philosophical concept of 5S has been practiced in Japanese society through the principles of Shintoism, Buddhism and Confucianism for several hundred years (Kobayashi, 2008). With Japanese culture, 5S can be applied everywhere from workplace to private life. On the contrary, Western culture considers 5S as a tool which is effective to apply for workplace only. However, both East West researchers agree that 5S is a remarkably simple yet powerful tool to eliminate waste workplace (Cristina, 2018), reduce operational cost (Agrahari et al., 2015), improve clean and productive working environment. Moreover, the investment on 5S implementation is extremely low and this tool can be easily practiced, understood, and communicated. The most challenging factor of this system is to sustain the practice through long term period which requires the commitment of management and workforce of organization.

In Vietnam, 5S has been recently applied in both manufacturing and service sectors. Nguyen Dang Minh in his article in 2016 shows that 86% of 54 surveyed enterprises have been applying 5S. Along with Kaizen, visual management of 5S is one of most popular Lean tools used in Vietnam. However, though ratio of Vietnamese enterprises applying 5S is high, very few enterprises have been assessed how effective 5S is in their implementation: Nearly 11% of company respondents have never conducted 5S assessment and 37% of them evaluated yearly but without specific schedule (Dang Minh, 2016). Thus, it can be implied that Vietnamese enterprises still need more evidence about 5S effectiveness to strengthen their belief on the methodology.

According to Gupta & Jain (2014), Kaizen concept was often accompanied with 5S system to improve organization performance. It was introduced in Japan in 1950 when the government and management had a feeling that there was a problem in their current management system and a pending labor shortage. Implementation of 5S and Kaizen can happen in all workstations of the organization. The 5S and Kaizen method begin each program of improvement in a company. Therefore, it can be implied that an organization which has already had 5S implementation can further deploy Kaizen to boost organization productivity.

# 3. Data and methodology

This paper outlines the study into several steps. Firstly, it points out the practical motivations why 5S system needs to be put in place, which is fundamental for keeping 5S alive through initial time. Otherwise, it is tremendously difficult for an organization to recognize 5S actual benefits then to maintain it on a daily basis. Secondly, before implementing 5S, research literatures need to be studied to gain preliminary knowledge about the methodology. In addition, in this stage, a few surveys from researchers toward Lean experts and factory management need to take place to get foreseen insights of basic factors and challenges that may occur during 5S implementation. Thirdly, after getting understandings of the theory and advice from experts and management, PDCA cycle is chosen to execute 5S in real life, the starting time was 2020 January. After few initial months of implementation with some minor revisions, 5S launching team started to collect secondary data reflecting changes by time of waste, shipment rate and consumable cost. Besides KPIs measuring, working condition changes were also reported to management board and then feedbacks were summarized. All the changes were measured from January 2019, before 5S, till June 2021, after 18 months of 5S execution.



Figure 1: 5S implementation and review methodology in Esquel Ltd.

A range of data by time allowing us to have full picture of how effectively 5S contributed to Esquel Ltd. case in the next stage. On weekly basis, wastage, production, and shipment rate data is captured from MES (Manufacturing Execution System) and reflected in excel file then showed to management team to review and take actions accordingly. Finally, all lessons learned from this enterprise case will be revealed, then appropriate suggestions will also be raised for further improvements.

For execution plan, PDCA framework was used to execute 5S system. It can be described in four stages as below:

a. Plan:

Set clear target for 5S to improve. Targets should be focused on few matters only (fewer than five targets), such as Reduce waste under 3.5%, improve production and shipment rate more than 100% and reduce operational cost more than 30%. Man: Set up the leading 5S team with fewer department heads is the leader to have strong commitment from top level. Source: Author of this paper, 2019 Machine and material: According to a vast amount of recent studies, it is widely reported that 5S does not cost many machines and materials to proceed.

Method: 5S needs great efforts to train, set standards, 5S areas and Person in Charge, executive according to set standards, scoring mechanism, cross audit function teams, weekly meeting and review.

b. Do: Daily 5S activities are requested. Esquel has habits of performing exercises shortly at 9.30 AM and 16.30 PM. 5S activities also take place right after this moment for 5 - 10 minutes each time on daily basis.

c. Check and Action: Every Friday, a meeting to review 5S is set. In the meeting, all 5S activities are presented in Power Point for the whole team to talk, share and learn from each other. Scoring system set in planning stage will be used to assess the best and the worst team of the week. The best team will be honored while the worst team needs to do an improvement next week to improve 5S.

# 4. Results

# 4.1. Fabric wastage rate data by time

In year 2019, before any 5S activity set in Esquel Ltd., this factory was one of the most wasted one among all factories of Esquel group. On average, Esquel group fabric wasted rate was around 3.84% while Esquel Ltd. had this rate at 4.71%. Since 5S was in place from the beginning of 2020, the organization has witnessed

continuous reducing trend. Average monthly waste rate in 2020 stopped at 3.85% which was quite close to Esquel group average one at 3.71%. Further improvement was also seen for the next 6 months in the year 2021, from January to June, which presented the average monthly waste rate at 3.14% only (far below group average rate at 4.06%)





# 4.2. Production and shipment rate by time

Material saving is believed to be the foundation so that production rate can increase. This was true for this enterprise. With constant

*Source: Esquel group material utilization report, 2021* reducing trend of waste, Esquel Ltd. has raised it own production rate from 97.08% in 2019 to 100.69% in 2020 and further to 101.59% in the first half of the year 2021.







Figure 4: Average monthly Esquel Ltd. and Esquel group shipment rate by year Source: Esquel group material utilization report, 2021

As the result of increased production rate, shipment rate increased indeed. It increased from under 100% in 2019 to 100.34% in 2020, which is the first time Esquel Ltd. reaching the group average level (100.37%) and then went above group level at 100.49% and reached 101.51% in the first half of the year 2021. As a result of this fulfillment to customers order, starting from 2020, the factory had no air shipment to catch the delivery to customers which appeared to be very often in year 2019 backward.

#### 4.3. Consumable cost by time

Esquel Dong Nai, as similar as other factories, has few types of financial cost including consumable, decrepitation, wage and industrial park management cost (water, electricity...). After agreement with the management and experts' advice, consumable cost was chosen to reflect 5S effectiveness. The reason is that this cost relates directly to how factory purchase, organize, use and control production materials (paper, nylon...) and tools (scissors, knifes...) which are the main targets of 5S methodology.



*Figure 5: Average monthly consumable cost per piece of garment by year Source: Esquel Ltd. financial report, Finance department, 2021* 

According to financial summary by year as above figure, consumable cost experienced dramatical cost reduction from 2019 to 2020, when 5S was firstly introduced to this enterprise. The trend continued to maintain the same in the first half of the year 2021. Particularly, cost was at 242.5 VND/Pcs in year 2019 and dropped to 110.2 VND/Pcs in 2020 and 111.9 VND/Pcs in 2021. If 2019 is set as the base at 100%, the cost was reduced from 100% in 2019 to only 45.4% in 2020 and 46.1% in 2021. 4.4. Working condition changes by time

In this study, working conditions changes were also recorded by the number of pictures of working space before and after 5S launching. As visually seen, a total outlook change was found at production floors. In figure 6, the main production floor area which was full of nylon garbage in 2019 was found to be clear in 2020 with almost no garbage.



Figure 6: Production floor before (2019) and after 5S (2020) (Auto cutter area)

At another corner, in figure 7, we can have another visual look of how production space was saved thoroughly from 2019 to 2020 through 5S practice to remove all unnecessary stuffs out of production. Moreover, a new meeting room was Source: Author of this paper, 2019 set up after S1 step had taken place in an abandoned room. Similarly, figure 8 shows us an estimated 30-40% space saving due to 5S activities after more than a year.



*Figure 7: Production floor before (2019) and after 5S (2020) (Cut panel inspection area) Source: Author of this paper, 2019* 



Figure 8: Production floor before (2019) and after 5S (2020) (Pipe area)

# 4.5. Lesson learned

After reviewing all secondary data through a set of KPIs such as material waste, production rate, shipment rate and consumable cost, a survey toward management and Lean experts was also conducted. Their assessment of 5S practice from the face-to-face interview were found as below:

#### Strengths:

Involving management in 5S practice.

Improving practical KPIs to resolve the factual issues of company.

Bringing new images to production floor.

Sustaining through 18 months period.

Enhancing operational workers and staff's morale and saving estimated 30% working space.

Making 5S a daily habit.

# Weaknesses:

Empowering individuals to practice 5S is still a problem. The 5S launching was mostly from 5S project members, not from every individual in the factory.

Lacking long period of practice to cultivate 5S as a culture of the enterprise. 18-month period seemed not to be an enough amount of time.

Un-standardizing 5S implementation among teams and departments within factory were still found.

# 5. Conclusion and suggestion

5S implementation in Esquel Ltd. case study has brought several systematic reviews on how a

Source: Author of this paper, 2019

Japanese-originated concept could be effective in Vietnam situation, where working condition, culture and labor force are far different from Japan and developed countries. In overall, it is true that 5S can be applied anywhere regardless of those above-mentioned differences. Specifically, 5S practice was able to reduce wastage rate, improve production and shipment rate based on saved material, reduced operation costs and a tidier and more organized place. There are a few factors contributing to 5S implementation success. The most important ones are management commitment, clear standard, frequent training programs about 5S mindset and PDCA cycle framework for implementation.

Throughout the study, it can be suggested that the Kaizen system needs to go side by side with 5S methodology. On one hand, 5S can improve working conditions and save a huge space for production. On the other hand, 5S requires the number of ideas from workers to remove unnecessary stuffs, maintain necessary ones and visualize everything for a better control. All these ideas are part of Kaizen system but not the full one. Thus, integration of rewarding and sharing strategies as another part of Kaizen will fully motivate better involvement of 5S practice (rewarding systems need not be big and monetary but must be just-in-time, transparent and fair). In conclusion, the success of 5S system in Esquel can play as a model for other enterprises to place trust on 5S concept. The concept is simple and easy to practice yet its power is obvious. It may need more time than eighteen months to cultivate 5S as a culture of the Esquel factory. It is a long journey without ending and this initial time for Esquel was just a good start. The study through this case also brings some lessons and key factors related to 5S successful implementation. With these insights, 5S method is suggested to widespread to others with faster pace.

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Ngày nhận bài: 01/9/2021 Ngày nhận bản sửa: 15/3/2022 Ngày duyệt đăng: 28/3/2022

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