International Study on Application of Value Stream Mapping to Identify the Necessity of Lean System Implementation

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Abstract - This article shows the effectiveness of value stream mapping (VSM) applied to two completely different organisation. Without mapping the values considering the 3M- muri, mura and muda, the improvements can hardly be identified. Two kind of situation was reviewed and how the VSM was applied to the problems involving Material and People are described. Based on the gaps identified through VSM, how the lean techniques were implemented and improvements achieved are briefed. The reflections are discussed on how the lean implementation is needed for both scenarios.

Key Words: Kaizen, Standardisation, VSM, Lean tools, Kanban, JIT, 5S

Identified organization:

1)MaST International Group, Management Consultancy and training, Melbourne, Australia
2)Daioku- Automobile Lamp Manufacturing Company, Tainan, Taiwan

Background and Problem Definition- Case 1

MaST International Group is a management consultancy and training business that focuses on maximizing organizational effectiveness through people development. It has recently expanded across international borders to provide their services to clients on a global scale. It was seen that the office in Australia was unable to achieve its true potential, and hence the board decided to appoint a new managing director in the hope that they might turn the tables. And during the course of planning, it was noticed that there was a lack of systems and processes in place owning to the need for a new effective strategy. As they were going to undergo a rapid change in their organizational purpose and structure, and also in order to align itself with the parent business the office decided to incorporate the popular 5S practice in their business strategy. The following action research case study reports on the organization's Australian experience with 5S

Practice with a particular emphasis on:

•The link between 5S practice and the business strategic plan
•Changes in the internal culture of the organization
•The lessons learnt that could encourage the adoption of the 5S practice into the International Group

Description of Value Stream Mapping (VSM) applied to the Problem

This project clearly aimed to bring about change. Firstly, a change in the way the organization undertook day-to-day operations. Secondly, a change in business focus to that of taking charge of the loose business relationship with the client and consultant associates. The research aim was to monitor the change process such that the lessons learnt could be adopted globally by the group. It is needless to point out considering their present goals that the project had clearly aimed to bring about a lot of changes, significant were those pertaining to the way the day-to-day operations in the organization were undertaken, and also the change in business focus to take care of the loose business relationship with the client and consultants. It was to be implemented in such a way that sooner or later the practices could be extended on a global scale by the group.

Seire (Organization)

The most immediate issue at hand was that of all the unnecessary items lying around. This included excessive unused or unwanted furniture, old or dead files and other equipment just clogging access to most parts of the offices. The excess furniture was either to be removed from premises or dispatched for sale. Dead files and other related paper work that was deemed unnecessary must be archived elsewhere. File cabinets that had copies are expected to be properly sorted and sold if found unnecessary. The one-is-best principle of _Single point of contact 'must be developed to assist with the transition process. _One day processing 'should be popularized as business grows.

Seiton (Neatness)

Once everything was sorted and presumed to be in the right place, the work space was re- allocated in order to best conform to the new business strategy. Notice boards were cleaned once first, and once again. Filing cabinets and bookshelves were properly arranged in order to support easy access and were now of a readily available nature. White boards were once again used as working boards where everyone gathers their thoughts. Every individual is encouraged to be diligent to deal with the deterioration of the various practices , just in case something is out of place, and if that is the case must be remedied as soon as it can be at least or immediately at most.

Seiso (Cleaning)

The entire office required to be cleaned. Once the rubbish and excess furniture, paperwork and equipment is removed, it would be a wise move to appoint a new cleaning contractor. At least now we can hope that everyone would take care of their own work area, without having to be explicitly told what to or what not to do. Also, when the area is clean, it can always make something out of place more easily visible than if it was dirty.

Seikutsu (Standardisation)

Now there is a challenge to be faced, one that required setting standards in such a way, they are agreeable by everyone involved, including the customers clients and consultants, and of course their working relations. This is especially hard when some may find it hard to let go of old habits. The organization however must make it clear as to what is happening, where it is happening and with whom it is happening. An up-do-date knowledge of the present scenario must always be updated, so that it can lead to wiser use of the resources at hand. For instance color coding can be established to differentiate, where it might be difficult to, if otherwise. File cabinets can be replaced by book cases which make retrieving information much simpler.

Shitsuke (Discipline & Self-Discipline)

In order to implement the new strategy, it was vital to break old habits, and hence this aspect of 5 S is pretty much a foundation to the organization's 5S program. A new telephone answering practice and a new client handling procedure may be inculcated to promote further active participation by all employees, this helps in bringing to awareness that before people can work in both effectively and efficiently, they must first work on the business. An internal audit must be conducted prior to any meeting and the various ideas and information must be gathered to achieve the audit points.

Choice of Tools

The chosen framework was 5S. 5S was the right intervention at the right time and it was for the right reasons. It is clear that even with a similar or maybe different strategy, achievement would not have gained so much momentum, moreover applying these methods did not require any huge machinery or a set of new rules, it was mere improvising coupled with cooperation and dedication.

- Seiri - Sorting
- Seiton – Stabilize (neatness)
- Seiso – Systematic cleaning
- Seiketsu - Standardisation
- Shitsuke – Self discipline

Solution provided by the Tools

5S was undoubtedly the right solution for the right issue at the right time. The process of introducing 5S was a relishing experience amongst the team, especially with new team members. When informing client organization of the changes within the business, 5S is considered as being the center to those changes. The Link Between 5S Practice and the Strategic Business Plan. Initially 5S was introduced into the business plan solely for raising awareness at the Board of Management, in order to gain commitment to its introduction. Soon after other elements were being realised that the central contribution gained maximum momentum at the Board level. 5S was considered a pivotal part of the continual improvement process. The in –house computer program and the new model for client relationships were directly attributed to 5S. The organization could not cross reference every consultancy, training program, client participants all in one integrated package, leading to significant improvement in efficiency.

Changes in the Internal Culture of the Organization

The sole intention of the transition phase was to align the organization's practices and behavior to 5S principles. That was successfully achieved. Now the challenge the organization faces, is to remain aligned, this can only be achieved through continuous monitoring. Feedback was given to individuals and teams as required in order to assist with the management of the organizational culture. Occasionally misalignments occurred, but they were detected internally by the team and its members. In the case of a misalignment being identified, it was thoroughly investigated and made sure that re-alignment occurred.

Lessons for the International Group

The International Group was coincidentally grappling with similar types of issues that prompted the introduction of 5S into the Australian company. This was highlighted at an annual conference held. The Australian company is now supporting the International Group with the introduction of 5S. The implementation of 5S broadly followed Lewin's 3-Step Change Model (Robbins et al., 2000, p.440). Particular attention was paid to:

- Highlighting the dissatisfaction to the status quo as identified previously
- Involving staff in the decision to adopt 5S
- Gaining external advice and support
- All staff being briefed on the principles and application of 5S
- Staff deciding where to start the implementation process
- All staff being involved all the time

- Celebrating the successful introduction of the 5S principles
- Planning for ongoing alignment and re-alignment

Improvements Made

- A new team value of _if you see it, do it'was practiced by every member
- Commitment by all staff is openly demonstrated with actions such as the joint development
- Various practices and methods are incorporated in other offices, situated around the globe

Summary and Reflection

5S provides a clear and a greater solution to any unorganized business. This unorganized company was changed to a standard organized company by the implementation of 5S.

•The unwanted documents and the furniture were sorted cleared and all the documents were sorted and made its accessing easy for everyone
•The work place was then made tidy and taught everyone to sustain the neatness
•The work place was set to a particular standard in order to bring in an organized way of carrying out the activities in an orderly manner
•The audits are maintained for all the activities to sustain the standards

Background and Problem Definition Case -2

Daioku, automobile lamps manufacturing company situated in Taiwan is a small manufacturing enterprise. Since the world market of lamps is moving towards high variety and low quantity, and both the life cycle of the lamps and the lead time available from customer's orders to the delivery of lamps are getting shorter, top managers of Daioku Co. have been under great pressure to improve the overall competitive position of the firm by improving quality and productivity. The executive manager at Daioku started promoting a JIT system, with the hope that the inventory level can be reduced and productivity can be improved. This will help Daioku to become more competitive in offering internationally acceptable quality lamps at competitive prices.

Description of Value Stream Mapping (VSM) applied to the Problem

•One of the major objectives in implementing a JIT system is to achieve a common goal of the whole company
•The main basic thing is to improve the level of education and training
•To encourage suitable incentive schemes and promotions
•Three level managers were selected to participate in TPS seminar, with which they taught the whole company
•A committee consisting of the manager of all departments were formed to plan and implement JIT system so that they could discuss and learn from what was going on and could plan for the future programme
•The basis of JIT is 5S, which was implemented initially and with 5S activities, the working environment was cleaned up to improve the safety, quality, productivity
•5S card called ―Red card war‖ was proposed with which all department managers posted the unnecessary materials and deposited for further rework
•Visual management was strongly motivated and encouraged
•5S activities have become routine to everyone in the company
•Kanban system was established where every supplier is required to collect the
―Kanban‖ back from the order-post and ship their materials based on the information in the Kanban
•Men, machine and materials were integrated efficiently using standardization of various process and material flow path so that the results of the implementation of JIT and maintenance of any improvement project can be realized without wasting any resources in the whole process
•TPM activities like cleaning up the simplest equipment's were practiced where every worker learns to inspect, lumping

and other related activities so that equipment's on the shop floor can totally be under a self-maintained situation
•TQM activities like quality cost control, teamwork spirit, and techniques to learn quality control were established and encouraged to help the people on the shop floor to solve their problems by themselves and giving them the motivation to continuously improve their working environments

With these, Daioku Company has laid down a solid foundation for the JIT system so that the production system can be operated smoothly to improve safety, quality and productivity over the years

Problems faced during implementation were;

•Combining the information and material flows instead of separating them
•Post the products, its tore and manufacturing process instead of a flow without any post
•Changing the L-shape assembly line into U-shaped assembly line. A number of new techniques and new equipment's, although not necessarily the newest are required to be developed or purchased
•All other departments such as R&D and transportation are required to participate in the JIT project. Every department has been instructed to investigate how to make the shop floor operate in a simpler and more efficient way

Choice of Tools

The choice of tools in this case study depicts a classic lean involving all major lean techniques.

•JIT
•Kanban
•Standardization
 •TPM

Solution provided by the Tools

Intensive education, training and promotions organized to lay the foundation for JIT implementation have been extended to every small plant within the company.

•Kanban has moved the traditional push-type production management to the pull-type management adding to the value of profitability of the company
•JIT provided a rational level of parts to eliminate unnecessary spare parts and allow the packaging and moving of materials smoothly
•Standardization have eliminated overproduction and waiting time of materials
•Implemented a single-person and multi-machine scheme on some cells and reviewed the fast-change—moulding activities together with some training
•TPM has reduced the breakdown rate of the equipment's and had made all the equipment's available at all times
•To prevent the production of unnecessary products (including parts, products and documents) many ＿idle facilities‘ are created where every check point in the company is provided with the kind of facility so that the workers would not carry out unnecessary tasks accidently

•Daioku also sent experts in helping suppliers to solve their problems gradually and the inventory of parts were therefore reduces dramatically

Improvements Made

•WIP inventory level has reduced from a market value of 30 million NT to 5 million NT
•Parts inventory has reduced from 130 million NT to 60 million NT
•The number of workers has reduced from 580 to 520 in three years where the growth rate of the company is 5-10% per year

Besides the physical outcomes, a major advantage is allowing every worker to have improvement motivation and ability. From this, quality and productivity problems _under the water' have shown up and are solved. This kind of cycle, strengthen the organisation and spirit of the company so that it can be more competitive in the long run.

SUMMARY AND REFLECTION

JIT requires change in management of various production operations, but not necessarily investment of capital resources such as automation, new equipment and workforce.
•The implementation of JIT in small manufacturing enterprise should start with layout revision, schedule stability and the development of long-term supplier-customer relationships
•A new purchasing philosophy supporting frequent purchases of small lot sizes may help small manufacturing enterprises in implementing a JIT system
•Education and training of workers in small manufacturing enterprises about JIT concepts and their high leverage opportunities would tremendously support the implementation of JIT , workers must be cross-trained, highly skilled and very disciplined
•Identifying the value-added and non-value added items in shop floor activities are important to implement JIT
•Top management commitment is necessary to ensure the effectiveness and success of implementing JIT

CONCLUSIONS

The Value Stream Mapping is very essential to streamline the end-end linked actions, processes and functions that is a must to transform the inputs and outputs for identifying and eliminating wastes. The VSM implemented was described and reviewed in detail to understand linked actions and processes in order to find the intensity of the problem and opportunity to implement the lean techniques. The tools implemented have been detailed in how it had impacted the company. Lean tools such had 5S is one of the very important tool for standardization of any company to continuously improvise the efficiency.

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