

FRAMEWORK FOR THE IMPLEMENTATION OF A SUPPLIER KANBAN SYSTEM IN A SMALL AND MEDIUM SCALE INDUSTRY

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ABSTRACT

In the competitive environment of the automotive components industry, where the survival of a company is highly dependent on its ability to keep cost manageable and selling price low, an efficient inventory management system will reduce the cash tied down in inventory and improve the financial cost associated with it. This paper provided a step by step framework for small and medium scale industries (SMI) within the automotive component industry to implement a Supplier Kanban System (SKS) for managing and controlling the volume of stocks housed in their respective warehouse. The main benefit to be gained from implementing the Supplier Kanban System (SKS) is the reduction of inventory and manpower required to manage this inventory. When effectively implemented, the company will hold only three days inventory and the supplier will continuously replenish the inventory to sustain a three day stock level. The three day stock level is necessary because of the volatility of demand within the automotive industry in Malaysia and is designed to strike a balance between keeping Just in Time (JIT) stock and overstocking. The framework is divided into three levels and the first level evaluates a company's suitability to implement the Supplier Kanban System, the second level guides the company towards the preparation for the implementation and third level guides the company on the implementation and sustainability. Each of these levels has a series of steps, which has to be executed sequentially and one can move to the next level only when the current level has been successfully implemented.

Keywords: *Supplier Kanban System (SKS, inventory management system, automotive industry.*

INTRODUCTION

Kanban System is nothing new and has been around since the 1980's, first introduced to the world by Taichi Ohno, who is credited as the father of the Toyota Production System

(Schonberger, 2007). A Kanban system is an information system that assists the company in producing the right product, in the right quantity and at the time it is actually required (Monden, 1981). This article focuses on one part on the Toyota Production System, namely management of suppliers using the Supplier Kanban System. This framework was developed over a period of three years from 2012 to 2014 using the action research approach consisting of core action research project and thesis action research project as proposed by Chad Perry and Ortun Zuber Skerriit (Perry & Zuber-Skerritt, 1992). The study was conducted in APM AutoelectricsSdn. Bhd's (APMAE) warehouse as the unit of analysis (Kock, 2004). The objective of the core action research was to reduce the inventory stored in the warehouse and that of the thesis action research was to develop a framework for the implementation of the Supplier Kanban System. The framework was developed through learning cycles (Coghlan, Rashford, & de Figueiredo, 2015) and reflected during the implementation of the SKS in APMAE.

THE SUPPLIER KANBAN FRAMEWORK

The Supplier Kanban Implementation Framework was developed using an action research (Lewin, 1946) approach. The practical, propositional, presentation, and experiential knowledge (Brannick & Coghlan, 2005) gained during the action research cycles and experiential cycles were developed into a Supplier Kanban Implementation Framework. This framework was designed to guide small and medium sized industries, with limited resources, in implementing SKS.

The framework is divided into three levels and each level has to be completed before the succeeding level can commence. Each of the level has steps which can be done concurrently except in those cases where the steps are required to be done sequentially. These steps are designed to help the implementer prepare the employees, management and supplier towards the successful implementation. If at any point, in any of the three levels, the implementer is unable to complete all the steps, the company needs to review the decision to implement the SKS. The implementer has to review why these steps could not be implemented and how to overcome these obstacles before continuing the journey. Once all the steps in a particular level have been completed successfully, the current level is complete and the implementation can move to the next level. Once the implementation has been successfully completed, the company needs to focus on maintenance, motivation and innovative ways to sustain the system.

Level 1-Assessment

Level 1 of the framework is the assessment stage and is shown in Figure 1.

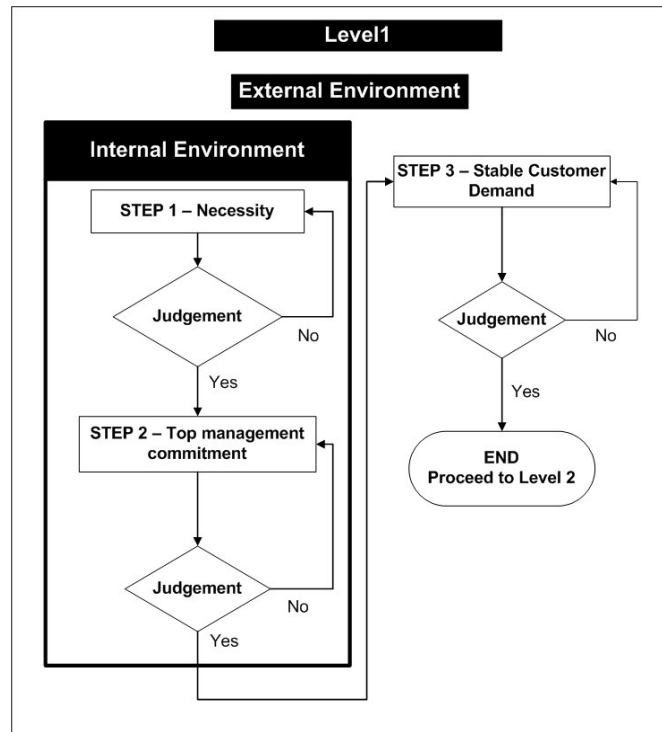


Figure 1
 Assessment Stage Framework

Level 1 is designed to determine if the internal and external operating environment of the company is conducive for the implementation of a SKS. This level has three steps, the first two is internal to the company and the third is external. Step 1 is titled ‘Necessity’ and questions the company’s motive for implementing the SKS. Step 2 is designed to evaluate ‘Top management commitment’ and explores the extent to which top management is committed to implementing the SKS. Implementing a SKS is disruptive in nature and incurs capital expenditure, both of which necessitate top management support and commitment for its successful implementation. If the answer to the first two steps is yes, then we can proceed to step three. Step 3 requires a study on the customer demand pattern. If there is large variation in customer demand exceeding 15%, then a Supplier Kanban system is not appropriate as stable customer demand is one of the pre-requisite for a Supplier Kanban System. The company can proceed to Level 2 once all the conditions stated in Level 1 have been satisfied. Completion of level indicates that the company’s internal and external environment is ready for SKS implementation.

Level 2 – Preparatory Stage

Level 2 is the preparatory stage, which has eight steps depicted in Figure 2 and Figure 3. As the name suggests, it involves planning and making all the preparation for the implementation. The eight steps in Level 2 are

- appointing the project leader,

- resource allocation,
- taking stock of the current position,
- establishing goals and timeline,
- forming a steering committee,
- forming the work groups who will make all the necessary preparation,
- establishing a monitoring and reporting system and
- finally, establishing a method of recognizing, appreciating and rewarding the top performers.

The first step, 'Project Leader Appointment', is the responsibility of top management and has to be undertaken before the rest of the steps can commence. Once the project leader has been appointed by the company's top management, he has to go through the remaining seven steps and establish the rest of the implementation plan. The project leader is a key person in the implementation of the SKS and the person appointed to lead the SKS must meet the following criteria. The person must hold a senior position in the organization with experience, authority, knowledge, motivation and drive.

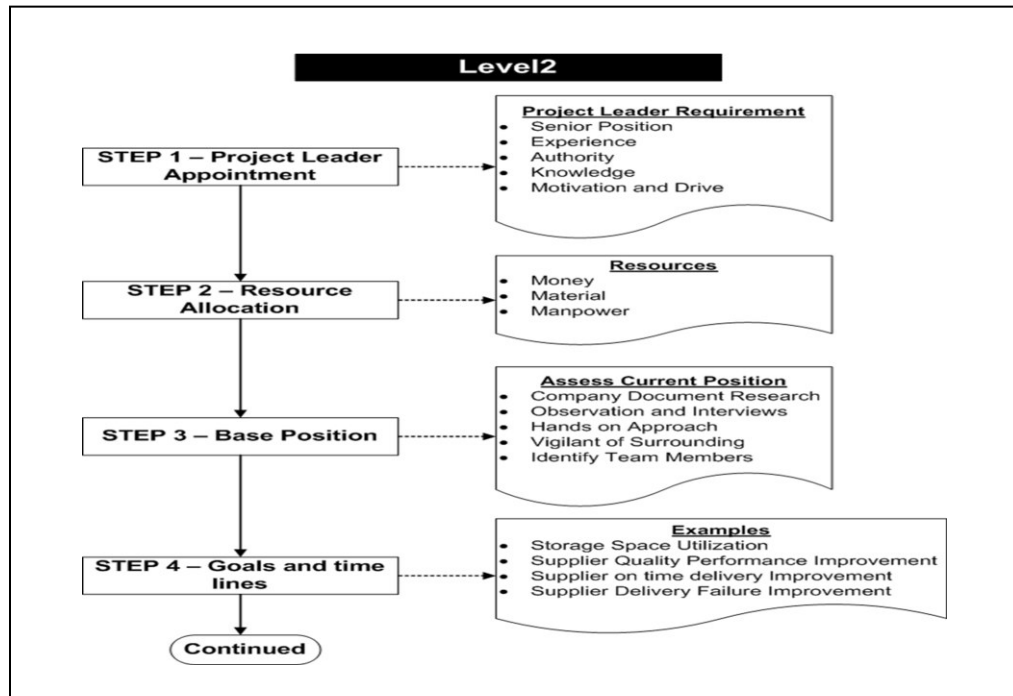


Figure 2
Level 2, Steps one to four

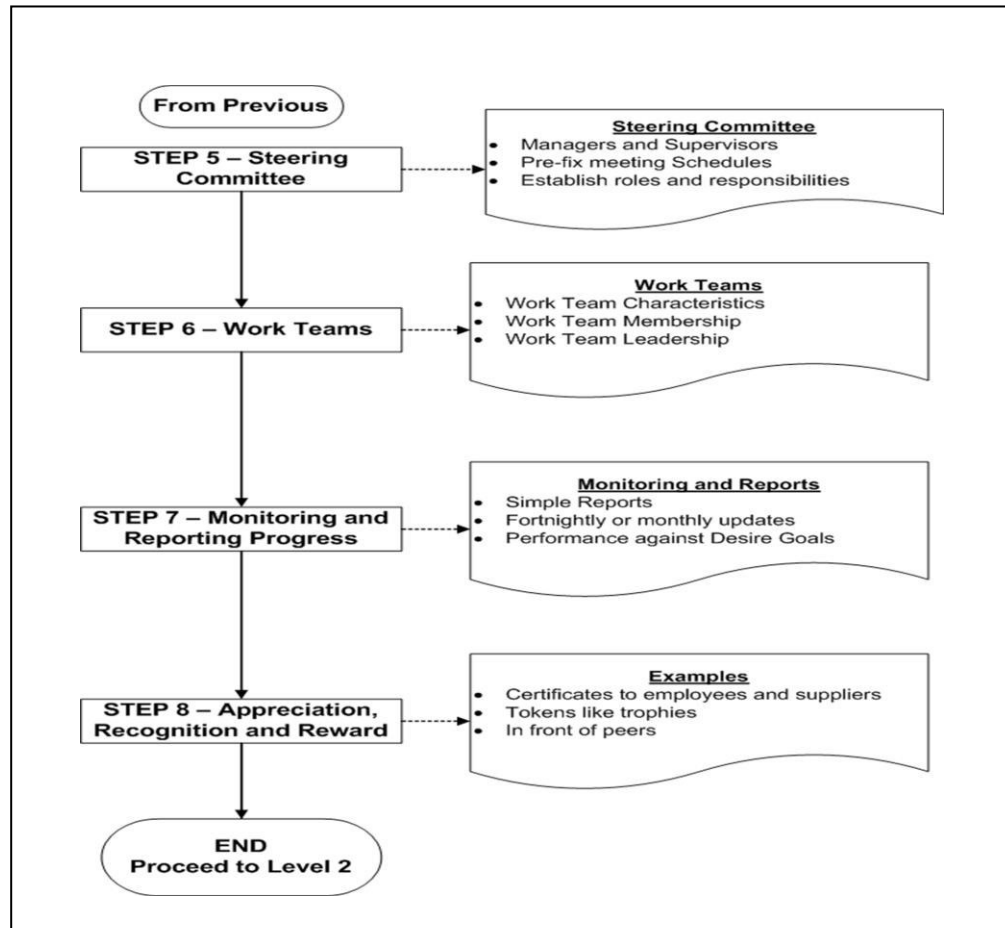


Figure 3
Level 2 Steps five to eight

The project leader will need to prepare the implementation schedule and the current state of the company in terms of the areas, which are going to be improved. This will provide a reference for monitoring progress, comparing improvements against a fixed base line charted out at the onset of the project. The project leader will need to establish a steering committee to oversee the project and make executive decisions when required. The handpicked project team will make all the necessary preparations for the implementation guided by the project leader.

The progress of the project needs to be tracked on a regular basis. Necessary corrective action has to be taken either by the project leader or the steering committee whenever there are deviations from the plans. Finally, the project team must create a 'feel good factor' by appreciating, recognizing and rewarding personnel who contribute significantly towards the implementation.

Level 3 – Implementation

Level 3, as shown in Figure 4, Figure 5 and Figure 6, has nine steps and is predominantly

concerned with the implementation and sustainability of the Supplier Kanban System. Level 3 can only commence once Level 2 has been completed. The most pertinent step of Level 3 is concerned with ensuring everyone in the company is aware of the company's intention to implement SKS. It is important to ensure that a majority of the company's personnel are aware of the direction of the company and are willing to buy into this implementation. The progress of the project must be consistently updated to all staff to ensure they are in the know rather than receiving fake news from the company's naysayers who wish the project to fail.

The tasks are divided into manageable portions within the limited resources available to a small and medium size company. Most companies have many suppliers, and this framework requires the company to divide and group the vendors. Once the suppliers have been divided into groups, the SKS team can work on implementing the SKS on each of these groups sequentially. This involves, vendor briefing, preparing all the relevant documentation, vendor training, and execution. This approach may take a longer period but it is less taxing on the staff of small companies, who are constantly multi-tasking.

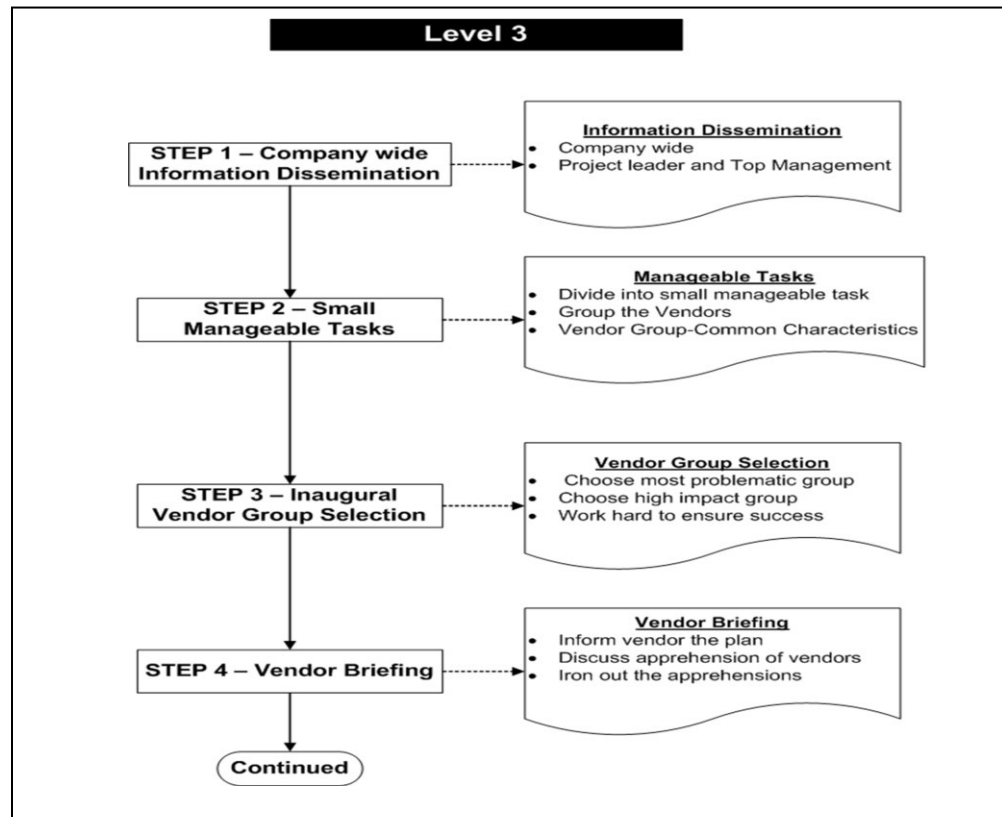


Figure 4
Level3 Steps one to four

The SKS is designed to be inclusive in nature, requiring active involvement and participation of all staff and management. The steps are designed requiring the company

to work closely with the employees, management and suppliers, even to the extent of placing the company's personnel at the suppliers' factories in the initial stages of the implementation. The motto is succeeding at all cost and failure is not an option.

Finally, after the implementation, attention has to be paid to sustainability, as the project will receive a lot of attention and push from top management and interested parties, in the initial stages of the implementation. After the implementation, the attention of the key drivers will move to other areas of interest. Top management attention will shift elsewhere and enthusiasm will wane and the SKS will be left to run. It is imperative that systems must be put in place to ensure continuity and sustainability even after the project has been successfully implemented.

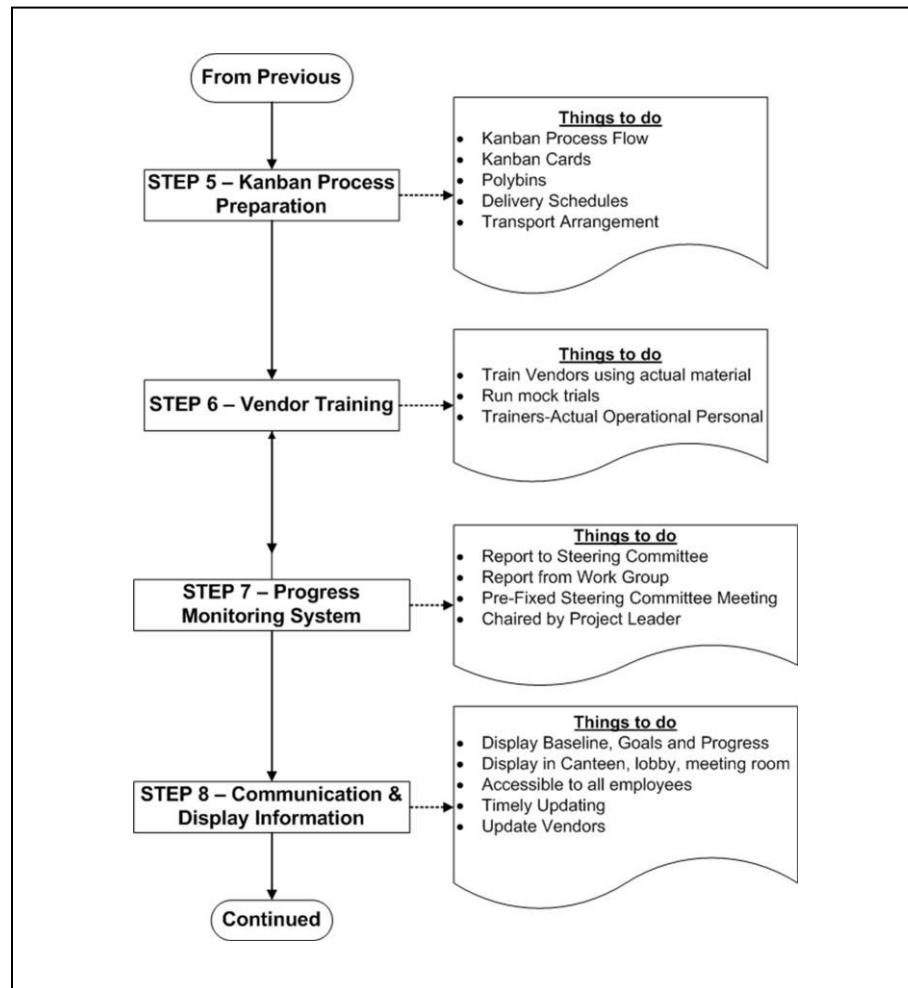


Figure 5
Level 3 Steps five of eight

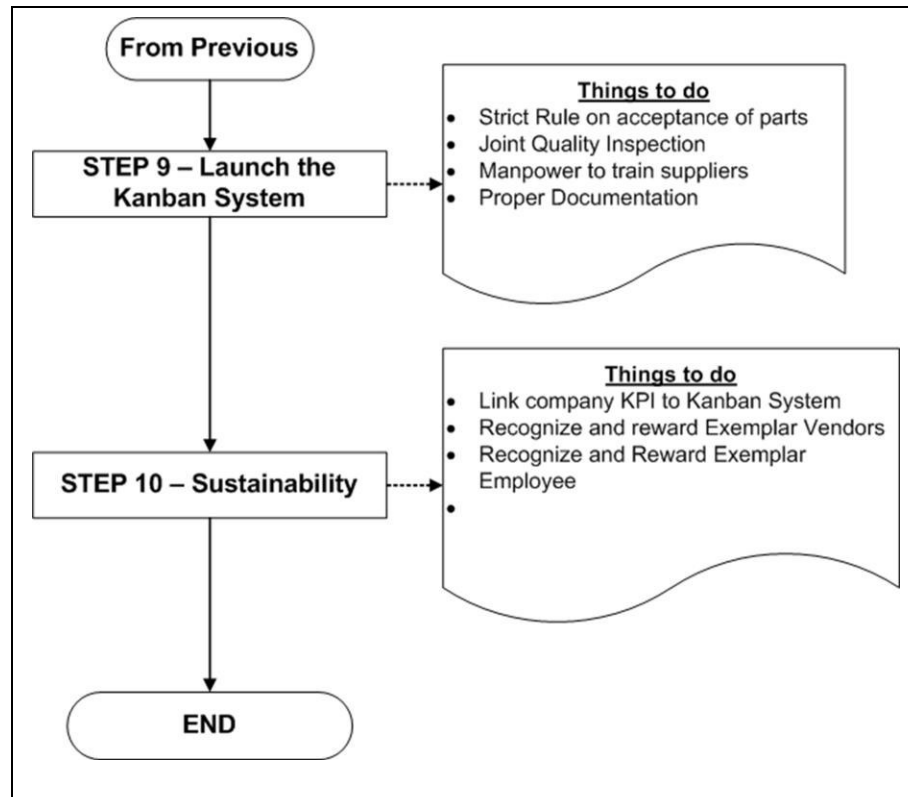


Figure 6
Level 3 Steps nine and ten

RESULTS

The SKS implementation, APMAE, was successful and APMAE managed to achieve the following. The outcomes from the core action research project were as follows;

- I. Storage space utilization was reduced from 1450 pallets of goods stored per month before the implementation to 1050 pallets after the implementation, constituting a space saving of 28%. The rental cost of the warehouse, which is located in Tg. Malim is RM 70,000 per month. The savings in rental cost is RM19,300 per month, which is equivalent to RM232 thousand per year.
- II. The number of manpower in the warehouse was reduced from 24 workers before the implementation to 15 workers after the implementation. At an average cost of RM 1,800 per worker, the savings per year amounted to RM195,000 per year. No one was retrenched but the manpower was transferred to other sections.
- III. Another non-monetary improvement was the elimination of double handling by buying off the finished goods at the suppliers premises and receiving the goods to stock in APMAE.
- IV. There were reductions in administrative work in monitoring the suppliers as the Kanban system ensured the suppliers delivered the right quantity based on the Kanban cards.

- V. Finally, APMAE established a single channel of communication between the suppliers and APMAE's key management staff namely, purchasing, warehouse, production, production planning and QA. This eliminated all miscommunication as everyone is in the loop and the various departments were able to react very quickly whenever they saw potential trouble.

The outcome from the thesis action research is the Supplier Kanban System Implementation framework.

CONCLUSION

The demand in the automotive components industry to be competitive is getting louder and louder. The recent declaration by the Second Minister of International Trade and Industry, Datuk Seri Ong KaChuan that Proton vendors need to cut prices by 30% is testament to the dire straits of the automotive components industry in Malaysia (FFME, 2018). In Malaysian automotive components manufacturing environment, the cost of materials and manpower make up over 80 percent of the product cost. The material and manpower cost are more or less fixed and cost saving must come from other avenues. Companies can reduce operating cost by looking at implementing the SKS as a means of reducing manpower cost and rental space cost.

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