BEING THE LEAN DREAM

M. van Staden¹* and W. du Plessis²
¹Department of Project Services
IT Dynamics, South Africa
magdelvs@itdynamics.co.za mailto:14581264@sun.ac.za
² Department of Project Services
IT Dynamics, South Africa
wernderdp@itdynamics.co.za

ABSTRACT

In the words of the father of Lean, Taiichi Ohno: “The two pillars of Lean thinking are Just-In-Time and Automation with a human touch, or Autonomation” (Ohno [3]). He was of the opinion that people arrive at their workplace to ‘think’ rather than to ‘work’, wanting to be creative and effective. They should be inspired towards new ways to work smarter, not harder.

Imana Foods is based in Durban, South Africa. Their vision over the past 30 years has been not just to produce high quality great tasting products, but to make a difference in the lives of Imana Consumers, Customers and Employees. This is better known as the ‘Imana Dream’ and their main vehicle for accomplishing this is Lean.

This paper will use Imana Foods as a case study to discuss how Lean initiatives move them closer to their dream. Concepts include Kanban, Production Levelling, 90 day Accountability A3, Imana Book Club and their continuous strive to Autonomation.

* Corresponding Author
1 INTRODUCTION

Imana Foods, a Durban based food manufacturing company, has the dream to restore Africa to Eden (see section 3). Their main vehicle used to accomplish this is the Lean philosophy. Lean is a very broad and encompassing philosophy, and can be very difficult to implement when looking at it as a whole. Successful Lean implementations are typically broken down into smaller projects or initiatives. At this moment Imana Foods don’t see themselves being a Lean company, but rather aspiring towards it by the way they do their everyday activities.

This paper uses Imana Foods as a case study to show how small initiatives can have a big impact towards a Lean culture, and how it then becomes doable to implement Lean and in turn support Imana Foods in reaching the Imana Dream.

The initiatives implemented in Imana Foods will be discussed in two categories. The first is the physical factory implementations in order to eliminate waste, namely Kanban, Production Levelling and Autonomation. The second is the applications on the human resources, namely Core Workforce, 90 Days Accountabilities A3, Imana Foods Book Club and Skills Based Pay.

2 A BRIEF DISCUSSION ABOUT LEAN

Lean started with Toyota with the oil shock of 1973 and the resulting years of low economic growth. It was with this, that the movement away from mass production started. Taiichi Ohno, the father of Lean (also known as lean manufacturing or the Toyota production system) said that they had to eliminate the idea of ‘the more the better’ (Ohno [3]). He also defined Lean as follows:

“The basis of the Toyota production system is the absolute elimination of waste. The two pillars needed to support the system are:

- Just-in-time
- Autonomation, or automation with a human touch”

Mass production in actual fact produces a lot of waste. When the waste is totally eliminated, through the application of various tools and techniques, can a plant or business truly be Lean.

Ohno [3] identifies the 7 areas of waste (muda), as follows:

- Waste of overproduction
- Waste of time on hand (waiting)
- Waste in transportation
- Waste of processing itself
- Waste of stock on hand (inventory)
- Waste of movement
- Waste of making defective products

3 THE IMANA DREAM

Imana Foods (PTY) Ltd, started in 1984 from a garage in Kloof, Kwazulu-Natal, with a dream of redeeming Eden, or returning the beauty to Africa (Ukabuyidela ubuhle be Afrika). They started making soya mince in order to provide a cheaper option of protein to the low income group in Kwazulu-Natal. From there they grew to being the leader in the South African Soya Mince market and the number 2 player in the Stock Cubes and Economy Soup market (Imana Foods [6]).

There are three core strategies that form part of this dream. This includes the following:

- Core Competence
Process Centring
Leverage Alliances

Core Competence is about being the best in what Imana Foods do, i.e. to truly excel and be the expert and master in the field. Part of this is to unleash the potential of every employee and partner; to develop missionary entrepreneurs and thinking people to be more and do more within their working environment. It is really about empowering the “rock face”. Rock face” is the term given for the area where the product is being made, the production factory. Hereby, Imana Foods are saying that the employees working at the rock face is the most important in the company. If they are taken care of, supported and their needs attended to, they will be motivated to produce the best products and so assist the company to grow even more, as seen in Schuitema [4]. Core Competence further involves motivating the employees, especially those that work at the rock face to identify areas for improvement within the business in order for them to do their work better. By initiating an A3 project, the employee can implement his/her own ideas together with a team of employees from the business.

Process Centring refers to reducing the “red tape” between the employees and the company strategies. Imana Foods wants to have each employee that works at the rock face to embrace the strategic goals and to practically see how they can be a part of reaching it in the way they do their everyday work.

Finally, through Leverage Alliances Imana Foods focusses on their Core Competencies, while outsourcing all other tasks and functions to strategic business partners. These alliances are seen as vitally important and are being nurtured to ensure mutual business growth and success.

Imana Foods believes that with using and applying Lean in the factory, great changes can be made and that it can be used as a vehicle to accomplish this dream of a better Africa for everyone. The following section will explain what Lean initiatives Imana Foods has implemented, is currently implementing and initiatives that will follow soon.

4 LEAN IMPLEMENTATION AT IMANA FOODS

There are two main processes in the Imana Foods factory with the first being Blending and the second Packing. In the Blending process, raw materials are picked from the warehouse and put in front of the blenders for blending. After blending the Work In Progress (WIP) get sent to the Packing process where the blends get packed and then sent to dispatch to be palletised.

In order to streamline and improve these processes and the business as a whole, the following initiatives are being implemented and improved upon, namely Kanban, Production Levelling, Autonomation, Core Workforce, 90 Day Accountabilities A3, Imana Book Club and Skills Based Pay. These are discussed in more details below.

4.1 Kanban

For the bigger part of Imana Foods’ existence, the picking, blending and packing happened unsequenced. The ERP software hosted by IT Dynamics, called QAD, provided a list of works orders that needed to be blended and packed for the day. The pickers picked the items for any works order on the prioritised list and placed the picked items on pallets on the factory floor in front of the blenders, in no structured sequence. The blenders then selected any of the picked works orders to blend. After blending, the work in progress was placed in the factory on the pallets on the floor between the blenders and packing lines. The operators on the packing lines selected a blend from any of the available work in progress in front of the packing lines, to pack off.

This caused WIP to pile up in front of the packing lines since:
The blenders could select any works order to blend, regardless of the specific need from the packing lines at that moment.

For certain recipes, the blending process were much faster than the packing process.

The packing operators could select any blend to pack off, regardless of the specific need from the Customers.

In order to control this process better a manual, visual kanban was put in place. According to Ohno [3], the way to achieve just-in-time is kanban and the purpose of kanban is just-in-time. Kanban is a scheduling system that assists in determining the timing, the specific product as well as the quantities to produce. This was done by placing racking in front of the packing lines. For each packing line, only two spaces in the racking were provided. The blenders could only blend if there was an open spot in front of the packing lines in the Kanban. A daily works order list was still provided from the ERP system forming the basis for the picking, blending and packing for that day. By combining the Kanban bins with the daily works order lists, more control and less WIP was already a result.

Imana Foods then took a step further in order to control the blenders. They systemized the Kanban through the application of Wonderware software and QAD. The works orders are automatically prioritised on an hourly basis using business logic. It is therefore impossible for the operators to know which works orders will be blended or packed next.

The blender operators use handheld devices loaded with the Wonderware software to assist with the Kanban process. The system provides and displays on the handheld device the next sequenced works order to be blended. Works orders are sequenced by considering the latest hourly prioritisation, as well as which packing line has the lowest Kanban, i.e. which line has the most available racking space.

Once the blending operation is started on the handheld device, a list of raw materials is displayed, together with the quantities. This is based on the Bill-of-Materials for the particular product. Each item is scanned with the handheld device tracking the raw materials and ensuring that the recipe is followed as designed. Once the blending is completed, the finished blend (work in progress) is emptied from the blender into a bag and placed in the Kanban racking as provided and the status updated on the handheld device.

Industrial Touch Screen PC’s are provided for the packing lines. The operator of the packing lines would log into the Wonderware application and indicate which packing line he is working on. He would then indicate that he wants to start a new blend. The system, linked to the ERP system, would then display which work in progress he is to pack off. That blend is then moved to the specific packing line and the operator starts the process on the touch screen PC and the line. In the packing process, the raw materials are packed into units. Units are grouped into shrinks and shrinks get packed into cases. Before the cases go through to dispatch, the case gets verified and counted, where the count gets updated real-time to Wonderware and then into the ERP system.

Once the packing procedure is completed, the operator would return to the touch screen PC and close the works order. In closing the works order, the expected number of cases (based on the recipe) and the actual number of cases (as counted at the end of the packing line) are displayed.

According to Dave King, the Production Director at Imana Foods, the production in the factory has been streamlined and the waste of work in progress has drastically decreased.

There are still some room for errors in the system with the current Kanban system's prioritisation logic. Situations can happen where some lines run permanently due to certain products in high demand, leaving some lines standing still. This has been identified as a room for improvement and is being attended to.
4.2 Production Levelling

Production levelling is the technique for reducing waste whereby the fluctuations in production is prevented in order to try to keep the fluctuations on the final assembly line zero (Ohno [3]). The goal of this is to produce work in progress at a constant rate, so that all following production can occur at a constant and predictable rate.

At Imana Foods the application of Production Levelling is very important in order to reduce idle time of machinery and people, as well as having control over the production in order to increase Imana Foods’ turnover.

The production levels for the factory are planned and discussed on a monthly basis. It is broken down into daily production targets based on the forecasted monthly production, the actual orders in the system and the available production capacity of the blenders and the packing lines. The targets per day are then further calculated as the average number of cases per works order.

Since all targets are calculated based on an average number of cases per works order and since the number of cases per works order may vary depending on the product, and that the sequencing and prioritisation occurs on an hourly basis, it is very easy for the factory to either over or under produce on the daily production targets. This could then result in “waste” of inventory of finished goods, or time in not reaching the targets.

Although Imana Foods has taken a step into the correct direction with applying some production levelling techniques, this area can still be refined to further reduce the fluctuations in production (waste).

4.3 Autonomation

Autonomation is automation with a human touch, as defined by Ohno [3]. This is where intelligence is applied to machines where if anything abnormal occurs, the machine would stop until the problem is fixed by a “thinking worker”.

Autonomation is definitely something that Imana Foods strive towards. They do realise that they can’t change the whole business in one go, and is therefore taking it bit by bit. Currently Imana Foods has therefore started to implement some autonomation initiatives.

They started building in some logic at the end of the production lines in packing where the cases get counted. All cases are transported via conveyors through metal detectors and then case sealers before being counted and passed through to dispatch.

It is very crucial for Imana Foods to know exactly how many cases go through to dispatch. Therefore the counting area should account for all possible scenarios that could cause issues with the counts, and stop the line if it does happen. The conveyor that leads in to the counting area will stop and then only allow one case at a time through the counting area. This is done with sensors that pick up when a case enters the area, and when it leaves it. There is also a reject line where cases will be rejected if there is any problems with the barcodes not reading correctly, or if the case is from a closed works order. If more than one case passes through to the counting area, the line will stop.

The counts from the PLC’s get sent to Wonderware, which then passes it on to the ERP system. If communication fails between the PLC’s and Wonderware the line will stop.

With the installation of the automatic stops in the lines if something out of the ordinary occurs, operators/artisans will be notified by alarms to go to the areas to sort out the issues.

Another autonomation initiative was done with the assistance of an A3 (refer to section 4.5 p.6). This project looked at autonomation in the Savoury Powders factory, by automating mundane tasks and in so doing, minimising the temporary labour per shift (refer to section 4.4 p.6). The A3 used is shown below.
The problem that was experienced was that sometimes the carton (case) flaps are not glued / closed properly which will result in a non-conformance. The operator would be required to remove all cases with open flaps from the production line before it enters the shrink wrap machine.

As people shouldn’t be doing mundane tasks (as per Lean), a sensor was placed on the conveyor as the cases exit the cartooning machines. The purpose of the sensor is to detect whether the lids are still open. If it is, then the line will stop and the operator can attend to the issue.

With the implementation of this solution, the need for two temporary employees on the lines has been eliminated. This resulted in the company saving a lot of money and giving the employees there more responsibilities.

4.4 Core Workforce

People, their welfare, development and improvement are very important for Imana Foods. In this, Imana Foods is very proud of having a “core workforce”. All permanent staff knows that they have a guaranteed permanent tenure with Imana Foods. Throughout the company, regardless of efforts of autonomation, or system improvements, no permanent employees have been or will be laid off out of financial or improvement efforts. With this in mind, employees can enjoy their work and give their best without having to wonder if they might lose it.

Where needed, Imana Foods makes use of a labour broker to supply extra temporary labour to assist in the production of goods, while Imana Foods are busy with system improvement projects in order to only employ the permanent staff.

4.5 90 Days Accountabilities A3

Imana Foods have embraced the A3 principle of problem solving. A3 is a problem solving methodology where a problem is identified and solved on one A3 page.

One of the key principles that form part of the A3 is asking why 5 times. This is referred to as “Five Whys” according to Shook [5]. Ohno [3] said the following while explaining why the practice of asking why five times provides the scientific basis of the Lean:
“To tell the truth, the Toyota Production System has been built on the practice and evolution of this scientific approach. By asking ‘why?’ five times and answering it each time, we can get to the real cause of the problem, which is often hidden behind more obvious symptoms.”

As Imana Foods’ staff is important to them, everyone in the organisation is invited to participate in the drive to improvement. Everyone, regardless of their job title, can initiate an A3. The A3s get submitted to the A3 committee who would prioritise and approve the initiatives as projects. It does not pass through the team leader. This is to ensure that all ideas are evaluated on the same level.

The approved A3s form the basis of each employee’s performance standards, or then their priorities for the next 90 days. Teams are created out of the current staff at Imana Foods to plan and execute the A3, led by the initiator.

During the design of the A3 template and process, Shook [5] has been used to provide the guidelines and principles. Below is the template currently in use in Imana Foods.

![Imana Foods A3 Template](image)

**Figure 2: Imana Foods A3 Template**

Through the use of autonomation in the factory, and by giving the employees ability to initiate an idea and implement it themselves, the drive for thinking people is greatly supported. This in itself contributes to the level of happiness and self-worth of the employee which then support the growth of the company.

As Ohno [3] said:

“Why not make the work easier and more interesting so that people do not have to sweat? The Toyota style is not to create results by working hard. It is a system that says there is no limit to people’s creativity. People don’t go to Toyota to ‘work’ they go there to ‘think’.”
4.6 Imana Foods Book Club

Over the years Imana Foods leadership thinking has been greatly influenced by reading certain books and seeking a common understanding of what the learning implications for the company are. The Book Club is an opportunity to broaden the knowledge and extend the thinking and learning to a wider employee audience within Imana Foods. The purpose of the Book Club is thus to generate alignment in Imana Foods thinking and business practices as they continue on their own lean journey, and so their Dream.

Every employee in the company was invited to join the book club. With this, everyone, from Directors to case packers, are put on the same level to read and study books on Lean and company improvement. Through this, people are encouraged to start thinking of ways to improve the business and how concepts discussed in these books can be implemented in Imana Foods in order to improve the business and their work experience.

This initiative has just started with over eighty people that signed up. Each employee that take part in this, is issued with a Kindle device loaded with the first book, “Toyota Production System: Beyond Large-Scale Production” by Taiichi Ohno and Norman Bodek.

Workshops will be held where the participating employees will be broken up into work groups to discuss the book on certain questions and to provide feedback to everyone.

Only once the first book has been read and discussed, will the next one be loaded on the Kindles.


4.7 Skills Based Pay

As part of the drive to Autonomation, it is very important to skill the people up while improving the system. It would not be of much use to have an intelligent system without knowledgeable people working with it.

It is for this reason, and for the personal growth of the employees that Imana Foods teaches their employees more skills. They have also adopted the system of Skills Based Pay.

The factory personnel can receive training in their specific area of expertise or ladder, namely Artisan, Food Technologist or Logistics Specialist. There is specific training on each ladder for the employee to achieve and then to move off wages and onto the salaried staff. As each step in the ladder is completed, and the employee passes the exam, their pay gets adjusted. Each skill on the skills training ladder has a credit rating and each credit have a set Rand value.

This system used to be a very complicated and lengthy process on the admin side, as the training department had to control the training, make sure it happens, get the results and issue a report of the training done to the Remuneration Director. The Remuneration Director would then manually calculate the adjustment of the employee’s wages and would then notify Payroll to update the figures accordingly.

As this process is very time consuming for all parties involved, it was decided to create an on-line Skills Based Pay system. The system consists of 7 workflow processes, 2 databases and 3 applications. The following figure shows the interactions between the workflow processes and applications that form part of this project.
Figure 3: SBP Workflow & Applications Interactions

The 7 workflow processes interact with each other, the Skills Based Pay (SBP) application, SBP database and the Document Management System (DMS) for the storing of all the applicable documentation in the correct employee’s folder.

With this system processes are used for the booking, planning and approving of training, the moving between or off ladders, the capturing of the training results and certificates and the management of the yearly increases.

This solution minimized the time spent on the admin of Skills Based Pay immensely. Retrieving training records, remembering to upload certificates, applying yearly increases, etc. are all standardised and is easily available with very little manual intervention required. System reminders can also be sent out to remind the training team when refresher training is required, etc.

With the installation and application of this system, it is clear to see how this supports the move to Lean and assisting greatly in achieving the Imana Dream.

5 CONCLUSION

Imana Foods benefits from the application of Lean initiatives in their business. By applying Kanban, Production Levelling and Autonomation initiatives, the production was streamlined by sequencing and prioritising works orders better, thus eliminating the wastes of overproduction (WIP), transportation, movement, processing and waiting. This, in return, saved the company a lot of money where systems and processes that were previously done manually are now automated and employees trusted with more responsibilities. Hereby it is evident that small Lean initiatives can make a big impact on a business.

With employees being part of the core workforce, giving them the opportunity to take part in the book club, gaining more skills and enabling them to identify and implement improvement initiatives, assisted in building a Lean culture and a more focussed business with better morale. This is seen very clearly in Maslow’s Need Hierarchy Theory where Imana
Foods satisfies all of the levels of basic needs. The figure below shows Maslow’s need hierarchy [1].

![Maslow's Need Hierarchy](image)

**Figure 4: Maslow’s Need Hierarchy**

Through the initiatives explained in this paper it is clear to see how the five needs are being fulfilled. The table below shows it more clearly.

<table>
<thead>
<tr>
<th>Basic Need</th>
<th>Ways Fulfilled in Imana Foods</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physiological needs</td>
<td>Provide lunch breaks, rest breaks and wages that are sufficient and in some cases above standard.</td>
</tr>
<tr>
<td>Safety needs</td>
<td>Provide a safe work environment. Everything is done to supply all PPE and everything gets implemented to the best safety standards. Provide job security through employees being part of the core workforce.</td>
</tr>
<tr>
<td>Love needs</td>
<td>Creating a feeling of acceptance and belonging by reinforcing team dynamics through the Imana Foods Book Club and the 90 Day Accountabilities A3 through which they can submit their own ideas.</td>
</tr>
<tr>
<td>Esteem needs</td>
<td>Recognise achievements by notifying the whole business of the successful implementation of A3 projects and the achievement of skills in the Skills Based Pay program. Wages are increased with the skills achieved in Skills Based Pay.</td>
</tr>
<tr>
<td>Self-actualisation needs</td>
<td>Through the application of autonomination initiatives and that the employees have more skills, more challenging and meaningful work is provided which enables innovation, creativity and progress.</td>
</tr>
</tbody>
</table>
Through enabling the business to be more productive and cost effective, Imana Foods can reach their Dream and their strategic intent of providing best tasting, good eating products of great value while growing fast and in so doing make a difference.

6 REFERENCES


