The Evolution of Lean Thinking at Tektex – where to next

Teaching Case Study

A Research Report presented to
The Graduate School of Business
University of Cape Town
In partial fulfilment of the requirement for the
Master of Business Administration Degree

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December, 2016

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Abstract

The dissertation presents a teaching case on Tektex, a technical textile manufacturing company under the Western Emporium. The case presents a narrative of Tektex’s journey in its adoption of lean thinking philosophy. The past and current challenges, such as Production Efficiency and On-time delivery were used to weave a coherent story. The case also emphasizes the need for developing a culture within an organization for sustainable lean implementation. It also brings into question the sustainability of lean principles in a dynamic business environment and the potential challenges regarding talent development and business expansion.

The intention of the Tektex case is to impart specific learning objectives relating to the adoption of successful lean philosophy in the textile industry. It will introduce the audience to the concepts of Kata in an organization after the initial adoption of lean and its deployment in the organization. Similarly, the case also allows the audience to understand the theory of Hoshin Kanri and its practical use. Lastly, the case emphasizes the communication of strategic goals in a company that drives all-round development within the enterprise at each level.

After imparting the learning objectives, the case questions will help contrast the theoretical concepts to their practical implementation through the literature review. Through Tektex case, students will be encouraged to identify key success factors and possible alternatives to Tektex’s application techniques. The lecturers will be provided with a suggested teaching plan, pre-readings for the students, and in-class questions with possible responses.

Keywords: Lean Thinking, Operational Excellence, South Africa, Textile & Clothing Industry, Technical Textile, Manufacturing, Lean Operations, Culture in Lean, Sustainability Iceberg Model, Toyota Production System, Lean Transformation Model
Plagiarism Declaration

I know that plagiarism is wrong. Plagiarism is to use another’s work and pretend that it is one’s own.

I have used the APA 6 convention for citation and referencing. Each contribution to, and quotation in, this report mentioned from the work(s) of other people has been attributed, and has been cited and referenced.

This report on K-Way’s lean operations is my own work.

I have not allowed, and will not allow, anyone to copy my work with the intention of passing it off as his or her own work.

Signature: Himanshu Vidhani (VDHHIM001)

Date: 9 December 2016
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1. Introduction and Context

Background

Situated at the southernmost tip of the African continent, South Africa is a country with scenic beauty, great outdoors, an ideal climate for adventure sports. It is due to these factors that South Africa is one of the world's fastest growing leisure travel destinations across the world. The country also has a highly diverse climate, culture, and terrain for tourism niches. It offers 1850 miles of coastline along with breathtaking mountains. South Africa’s topography along with an environment suited for outdoor activities, makes it an ideal ground for adrenaline aspirants.

The geographical richness and diversity of the country have provided companies operating in the adventure sports and outdoor apparel market an opportunity to cater to a broad market. However, the long history of political and economic instability in South Africa has been a hindrance to the growth of most of these companies.

In line with the above, Tektex found itself in the midst of a challenging environment, with internal and external challenges, leaving the business with an option to either evolve or to perish. With the support of the South African government, textile companies started looking for collaborative solutions to overcome obstacles such as international competition and illegal imports. These initiatives led to the formation of the Cape Town Clothing Cluster, which was created to respond to the pressure the industry was facing because of trade liberalization and increased global competition, along with the inherent local challenges. The primary aim of the cluster was to assist textile companies in improving their competitiveness, and one of the methods adopted was the implementation of lean in the manufacturing units.

With assistance from the cluster, Tektex started exploring the theory of lean (generally applied in the automotive sector) and adopted lean implementation to turn their dim situation around. Subsequently, this research reports in the form of a case study identify the theoretical and practical application of the same and capture the essence of Tektex’s journey of lean transformation and the way forward.
Case Theme and Purpose

The primary focus of the case is to identify the process of lean implemented in Tektex. Subsequently, the case focuses on the identification of ways for continuous improvement and overcoming obstacles that Tektex currently faces. The literature review highlights the history of lean and the application of lean tools which will facilitate the understanding of these tools and their applicability for the readers. Tektex’s case narrative and learning objectives are based on the following theoretical concepts of lean.

Hines, Found, Griffiths, and Harrison (2011) suggest that for the lean transformation to be effective, it is increasingly important to understand the concept of value adding, non-value adding and waste in organization processes from the customer’s perspective. When an organization can identify these needs and values, it attracts the customer to their products. Once organizations have that understanding, it becomes easier for them to implement lean and sustain it. To identify these values, organizations as first steps have to map the internal and external process flows. Subsequently, organizations should attempt to keep their customers satisfied, by focusing on developing processes that create value, which require organizations to eliminating waste. These are wastages that the customer would not be willing to pay.

As suggested by Hines et al. (2011) the Tektex case will use the sustainable lean iceberg model. This model highlights the sustainability of lean and in doing so emphasizes on the above the line (visible) tools and techniques, and process management that contribute to lean thinking. Conversely, it also focuses on below the line (enabling) aspects that allow the organization to achieve sustainable lean implementation by exploring in more detail areas such as strategies and its alignment, management, and employee behavior and their engagement within an organization. The need for a sustainable lean thinking approach arises because the implementation of lean still poses significant hurdles for organizations and these organizations may encounter complexities in sustaining lean in the long run (Jørgensen, Matthiesen, Nielsen, & Johansen, 2007).
The purpose of the Tektex teaching case is to document and demonstrate steps taken by Tektex in their situation and classify factors that were above the line and which were below the line that contributed to the problem and the solution. Thus, the case focus would be driven by factors such as production efficiency, on-time delivery, re-work rate, reject rates, which are tangible above the line factors and low employee morale, culture, and absenteeism which are invisible below the line factors affecting the implementation of lean. These factors will form the base of the intended learning objective of the teaching case. These are vital factors in delivering the intended learning objectives.

As per the sustainable lean iceberg model, the case would first engage students to identify (simple) above the line - visible factors that affected the implementation of lean at Tektex. This would direct them towards deciphering issues with three fundamental aspects of an organization, namely, quality, cost, and delivery. The above the line factors and lean implementation in these areas directly affect the processes within the business. In addition to above the line factors, the sustainable iceberg model, will also assist students in identifying the less visible factors that affect lean implementation. The below the line factors and lean implementation in these areas directly affects the people within the business. This will help the facilitator in sparking the question: should companies focus on process and not the people, or should companies focus on people and not the processes?
Along with identification of the factors mentioned above, a progressive lean thinker should be able to swiftly identify the role of strategy and its alignment in the organization. The strategy and its alignment are clearly visible when employees in an organization can articulate the strategy and demonstrate what they are doing in their daily jobs that will help the company to achieve its strategy.

Secondly, employing good leaders in the first place is not only essential for employees but the organization itself. These are leaders with the responsibility for providing guidance and inducing enthusiasm in the employees. This can be achieved by increasing the level of inclusion within a company, where every employee feels that they form a crucial part of the organization.

Lastly, positive behavior and increase level of engagement is the key for a long and sustainable lean journey for any organization. Numerous steps define the effectiveness and longevity of lean in an organization, and it entirely depends on how the strategies are communicated by the leadership and how are employees trained to align with the strategy. These factors need to house not just on the production floor but in all levels of the organization to have maximum impact and higher returns.

Similar to the focus and the theme, the learning objective also uses the above and below the line approach to impart learnings of the teaching case. The above-the-line learnings would be to understand the adoption of lean thinking tools and their use in the non-automotive industry. These tools are VSM, Waste Walks, Mura, Muri, Pull System and PDCA. Hodge, Goforth Ross, Joines, and Thoney (2011) have conducted a study to understand the ultimate goal of lean manufacturing in the textile industry, which is to eliminate waste and nonvalue-added activities in the production such that the customer receives the most value out of the service/product. They also claim that numerous companies to stay competitive have pursued to enhance their manufacturing capabilities such that they can counter the increasing competition from international companies.

Similarly, the case will explore the learning from below the line factors that would focus on comprehending the importance of culture and morale in effective implementation of lean thinking. Achanga, Shehab, Roy, and Nelder (2006) acknowledged that a supportive organizational culture offers an important platform for successful
implementation of lean manufacturing. They identified that it is essential for high-performing companies to be supported by the sustainable and proactive improvement.

**Learning Objectives**

Having identified the broad theme and purpose, the primary audience identified are the students pursuing management courses in operation management or lean thinking. Heath (1998) mentions it is important to determine the audience upfront as teaching cases are likely to be built on a theory which familiar to the specific audience.

Apart from the interesting appeal to its audience, this case obtains its value from the uniqueness in two aspects. Firstly, it highlights a topic which is unconventional in the technical textile industry in South Africa. Secondly, it studies a unique case of a local company that has successfully implemented and sustained lean thinking outside of the automotive industry.

The objective of this teaching case is to enable students in collating and synthesizing their knowledge of the associated subjects. As a result, the Tektex case study has been authored to accomplish the following learning objectives:

- Understanding lean thinking and TPS as a management system
- Application of lean concepts in a textile manufacturing context
- Introduce a successful lean adoption in the textile industry
- Develop an “entrenchment plan” for a company that has been on a lean journey for ten years, with a focus on how/whether a “lean project team” can withdraw from adoption
- Engage how to entrench lean thinking in an organization after initial adoption with specific emphasis on:
  - Kata, what it is and how it can be employed
  - Leader Standard Work, what it is and how it can be used
  - Hoshin Kanri - what it is and how it can be used
Motivation for research

This case is driven by a high motivation to highlight the adoption of lean thinking in the textile industry. There are numerous articles on the implementation of lean in the retail market in South Africa. However, there is little research done on the effects of lean implementation in the textile manufacturing space in South Africa. Additionally, in light of the current state of the South African economy, it becomes increasingly important to focus on lean implementation to be operationally efficient and eventually be profitable.

Due to the early formulation and adoption of lean thinking in the automotive industries, the adoption of these principles in other industries has been slow (Holweg, 2007). Subsequently, Hines, Holweg, and Rich (2004) identified that other industry after seeing an increase in the customer value had adopted lean tools to expanded business opportunities in their respective industries.

Exploring Tektex’s journey presents outstanding opportunities to see the applicability of lean thinking and tools in the textile industry, specifically in the technical textiles. The setup of Tektex can be compared to a factory setting of an automotive plant. Also, there is another similarity of mass production and standardization. Here lies great opportunity due to high variety – high volume environment and research have proven that implementing lean tools in such environments is an absolute necessity (Braglia, Carmignani, & Zammori, 2006). This case will help explore the benefits of lean thinking tools can bring about process improvements and efficiencies in an alien environment.

The teaching case based on case research would interest the students, as the storyline hints towards the practical application of concepts such as Pull System, Gemba, Toyota Production System, Toyota Way, Lean Transformation Model, Hoshin Kanri, and Kata; backed by other theoretical concepts taught in the lectures. It will help students identify the applicability of such tools in industries apart from the automotive sector.

This teaching case would be most appropriate for MBA operations management course or courses such as Lean thinking and Operational excellence. Alternatively, this case
can be used by textile manufacturers as a beginner’s guide to identifying loopholes to avoid while striving to achieve lean efficiency and operational excellence to add value to business. This case can also be utilized by The Cape Clothing and Textile Cluster (CCTC) to highlight best practices in the textile industry. For lecturers, it presents an opportunity to focus on teaching multiple lean implementation tools with an emphasis on the culture within the organization to impart specific learnings.

Limitations

There are numerous limitations of a teaching case study, Jennings (1997) identified author’s unreported bias and the potentially partial description of the situation as a major flaw in teaching case studies. Swiercz and Ross (2003) unpack that researchers are meant to report case facts accurately and are not supposed to make it a work of fiction. Subsequently, Kieser (1994) also brings to notice that information in teaching cases, as it might be inaccurate or partial because of the unlikelihood of constructing exhaustive descriptions of historical events. Ambrosini, Bowman, and Collier (2010) highlight another limitation where authors go beyond documenting the case and start interpreting actions and events. They also criticize this as the case documentation is purely based on the recollection of other people, which might have a bias in the way they remember the incidents or situations. Liang and Wang (2004) mention that due to the learning objectives of the teaching case certain issues may get precedence over the other to highlight a specific learning objective for the students. In addition to this, Ambrosini et al. (2010) also mention that a single case study might not provide comprehensive information to answer research questions or impart intended learning objectives.

Also, it should be noted that the case has been constructed for teaching the applicability of general tools and theories so that the postgraduate student of management practice can apply their minds to the further applications in other business environments.

Assumptions

The teaching case will be based on the assumptions that case writers, in reality, can capture and represent information to its readers. Another underlying assumption that trails a teaching case study is that writers construct their version of reality even when they strive to be as objective as possible (Easton, 1992), thus contributing to the
limitations mentioned above of reliability. Blaikie (1993) states that teaching case studies are best suited for individuals adopting an expansive view. For this reason, it is important to acknowledge that teaching cases are socially constructed. However, this does not imply that we cannot trust the findings of the researcher (Lincoln & Guba, 1985). Subsequently, it is assumed that the information provided by the Tektex management is factually correct and each of the interviewees shared information to the best of their knowledge. However, wherever there was a conflict of information, either further clarity was requested, or the information was not included in the case.

Ethics
The case preparations and relevant research were done in accordance with the Memorandum of Understanding agreed by Ronny Osborne, on behalf of Tektex. Consequently, Ronny or first line management at Tektex had full rights to review and remove any information they felt was confidential in nature or did not comply with their narrative, from the final teaching case before submission. The case study was reviewed and fictitious names are used to address the company and the employees. It is also agreed that final case study will be examined by the Tektex team before the final submission on 7th December 2016. Furthermore, alterations will be made to protect sensitive information with a commitment to retain the integrity of the narrative without fabricating information or being biased towards or against the organization (Yin, 1994).
2. Literature Review

The literature review further elaborates the theories that underpin the learning objectives identifies in the introduction section of the report. Woodside (2010) suggests that the purpose of the literature review is to provide theoretical context to the Tektex case while ensuring that the intended learnings are in line with the present-day thinking on these topics. The case is designed to facilitate the application of thinking in inconsistent and complex environments. The literature review briefly highlights the history of lean and consecutively explores several associated tools and techniques in the subsequent sections. The literature review also provides insights on the importance of culture and people development in organizations for effective lean implementation. Finally, the research report research examines how lean thinking has been applied in the manufacturing industry. Lastly, the literature further critically inspects the existing research and theoretical principles & standards as they relate to the broader field of lean implementation. Thus, the below table shows a comparison of the learning objectives to their corresponding Lean theories.

<table>
<thead>
<tr>
<th>Learning Objectives</th>
<th>Lean Theories</th>
</tr>
</thead>
<tbody>
<tr>
<td>Understanding lean thinking and TPS as a management system</td>
<td>• Toyota Production System</td>
</tr>
<tr>
<td></td>
<td>• Toyota Way</td>
</tr>
<tr>
<td>Introduce and adoption a successful Lean adoption in the textile industry</td>
<td>• Effects of Culture on Lean</td>
</tr>
<tr>
<td></td>
<td>• Lean Transformation Model</td>
</tr>
<tr>
<td>Develop an “entrenchment plan” for a company that has been on a lean journey for ten years, with a focus on how/whether a “lean project team” can withdraw from adoption</td>
<td>• Development of talent in Lean implementation</td>
</tr>
<tr>
<td>Engage how to entrench lean thinking in an organization after the initial adoption of lean.</td>
<td>• Toyota Kata</td>
</tr>
<tr>
<td></td>
<td>• Hoshin Kanri</td>
</tr>
</tbody>
</table>
**The Evolution of Lean Thinking at Tektex – where to next**

**Toyota Production System**

To provide the best quality, lower cost and shortest lead time by eliminating waste, the Toyota Motor Corporation developed the Toyota Production System house. This house is laid on a foundation of Stability, which involves tools such as Heijunka, standardized work, and Kaizen. While standardized work is self-explanatory; Heijunka (拮抗, !J*!) refers to the process of levelling production (reduce unevenness) which in turn reduces wastage; similarly, Kaizen (改進, r&=-g) refers to activities that continuously improve all functions and involves all levels of employees in an organization.

On each side of the base, there are two pillars, Just-In-Time and Jidoka. The representation of the house can be described as follows. The first pillar, Just-in-time (JIT) is a tool that is aimed fundamentally at decreasing flow times in the production system as well as reduces the response times from suppliers to customers. JIT further houses concepts such as Continuous Flow, Takt Time and Pull System. Similarly, the second pillar, Jidoka (用心棒) is a tool used to highlight the causes of problems, due to which the work stops immediately when a problem first occurs. This visual indication leads to improvements in the processes that build in quality by eliminating the root
causes of defects. It meant completely halting and correcting abnormalities as they occur; along with the separation of human and machine work.

TPS house is preserved and perfected through iterations of standardized work and kaizen, following Plan-Do-Check-Act. However, Shook (2014) is critical of the TPS house and calls it a prescriptive implementation model. He reiterates that TPS house is simply the application of different tools and techniques to achieve a certain objective.

**Toyota Way**
For the above-stated purpose, the 14 Principles of The Toyota Way, outline key principles for the management level to establish a better organization for servicing customers while being prepared for crisis situations. These appended 14 principles are restated from the book “The Toyota Way” (Liker, 2004):

1. Long term focus in making management decisions
2. Bringing problem to light by creating a continuous process flows
3. Avoiding overproduction using the "pull" systems.
4. Balancing out the workload
5. Get the quality right the first time
6. Thrive for continuous improvement by standardizing tasks processes
7. Pick out hidden problems by using visual control.
8. Empower people and processes by providing them with tested technology
9. Enable people to understand the work philosophy and teach it to others.
10. Acknowledge people and teams who abide by the firm’s philosophy.
11. Respect and help improve your partners
12. Understand the situation by being present at the site
13. Consider all options before making a decision. These decisions are to made by consensus.
14. Reflect on becoming a learning organization and improving continuously.

Lean implementation emphasizes not only on improvement by also focuses highly on the reduction of wastage. Hines (2011) suggest that recognizing and removing waste is necessarily fundamental to an organization but seldom satisfactory on its own. The focus on customers and productivity gains help identify wastages and problem of
quality within an organization. Shigeo Shingo (1989) identifies waste as something that does not create value for the client, and he identified multiple types of wastes under the TPS system, which have already been elaborated in the introduction section of this report.

Liker (1997) goes on to talk about how most companies currently focus on eliminating wastes from their processes which are not a sustainable way of implementing lean. Liker, in his “4P” model, encourages organizations to look beyond processes and focus on Philosophy, People and Problem solving as well, to make lean a sustainable management system. Similarly, Hines, Found, Griffiths, and Harrison (2011) highlight that much more needs to be done to make lean sustainable within organizations and they suggest the sustainable lean iceberg model which focuses on above and below the water line issues.

Ballé, Beauvallet, Smalley, and Sobek (2006) support the same by stating that it is not just about the Toyota Production System but the Thinking production system - it is not just about the tools and it is also about the people in the system. While multiple models are available to present the various factors that go into lean adoption, for the Tektex case study, the approach will be anchored in the sustainable iceberg model suggested by Hines et al. (2011) as it presents a broad and in-depth overview of the factors required.

The Evolution of Lean Thinking at Tektex – where to next
Lean Transformation Model

Shook (2014) highlights that the Toyota Production house inspires the lean transformation model. However, Shook (2014) also explains that the TPS house and the Lean transformation model differ significantly in their practical applicability.

Similar to the TPS house, the Lean Transformation Model is based on foundations, two pillars and a roof as shown in the figure above. The roof, houses a situation approach, defines the value driven approach for the problem organizations, are trying to solve; Shook (2014) calls it the “True North” of any situation in transformation. The two supporting pillars comprise of process improvement; these are changes in the work that we do as a part of any development program at work. The second pillar supports the organization in focusing on developing people at all levels in the organization; such that they can adapt to the process improvements. In the middle of the house resides the management systems, which are mainly driven by leadership behaviors. The foundation of the house is based on the fundamental thinking, mindset, and assumptions that drive the organizational and cultural transformation.
For simplicity, Shook (2014) transformed the house into five simple questions that become practical matters that an organization can address:

1. What value is the organization providing?
2. How will the organization improve the (value creating) work?
3. How will the organization develop its people to adapt to improve procedures?
4. What management systems are required for the transformation?
5. What basic thinking, mind-set and assumption drive the transformation?

By asking the above five questions, an organization can reach their goals faster by this experimental approach, with questions to address and experiments to try; rather than following a prescriptive approach that focuses only on the implementation of lean tools.

Kata and development of talent in a lean thinking system
Liker and Rother (2011) both agree that companies have fundamentally misunderstood TPS in practice. They mention that companies have mistaken lean solutions for the process that leads to operational efficiencies. However, it is the aspect of human thinking, and its alignment with the process is what underlies the success of TPS practice.

Rother (2010) found Improvement Kata as a means of aligning human thinking to processes. As described by Rother, Kata can be used to develop and utilize the creative power of people by breaking down abstract condition into a series of descriptive target conditions. This procedure involves teaching employees within a company a standardized way of understanding the crux of a situation by using an iterative scientific response. Simply put it “is a way to achieve things that you do not know how you are going to achieve” (Liker & Rother, 2011).

Liker et al. (2011) advocate asking questions on five themes every day to make kata second nature to employees. These five questions revolve around target conditions,
actual conditions, obstacles, next steps, and learnings. Research has shown that when presented with a challenging task, how people reach their target condition become paramount. Subsequently, repeating the task makes a solution to the target condition becomes second nature to employees. In Tektex’s case, Kata can be used by the employees to acquire new skills. As like any other employees, Tektex employees were also not born with technical and leadership skills; these are skills that have to be developed by repeatedly practiced them. This upskilling could be the best possible answers to Tektex’s dilemmas.

Effects of culture on lean implementation
Liker and Hoseus (2008) highlight that the culture within a firm should be the starting point for any organization for lean implementation. Every company strives and needs to make money. However, this should not be their primary purpose of the company, and it should not be the driving purpose for any business. The company’s focus should be on satisfying customers and strive for prosperity for all employees and partners.

It is suggested that organization should primarily focus on people in the organization. It is highly necessary to attract, develop, engage and inspire employees. This emphasis involves building a value stream of quality individuals who share the company’s purpose and values. It will enable organizations to build an army of employees willing to learn and solve problems. Secondly, organizations should focus on forming a culture that supports processes. They should be devoted to improving group and team dynamics, have open communication channels and develop a supporting servant leadership. Lastly, the organizations should focus on organizational-supporting processes. This involves crafting tools and strategies for a stable and secure employment, fair and consistent human practices regarding policies, promotion and setting objectives in the firm (Liker & Hoseus, 2008).

Bhasin and Burcher (2006) also suggest that its implementation of lean is valid only when it can change the culture of an organization. They also unpack that if an organization is facing difficulty in implementing lean, it is highly likely that is it due to culture and leadership in the organization and not because of lean tools and techniques. However, Badurdeen, Wijekoon, and Marksberry (2011) comment that none of the
empirical studies have investigated the role of culture in the successful implementation of lean.

Hoshin Kanri

Kondo (1998) describes Hoshin Karni as a form of strategic management which provides the link between strategic intent and its daily application in an organization (Witcher & Butterworth, 1999). The underlying principle of Hoshin Karni is that each employee in a firm should include a contribution of the main strategic priorities in their daily work. In doing so, the companies will be able to achieve a significant step forward than they would have been able to reach through regular work (Witcher & Chau, 2007). Tennant & Roberts (2001) have identified four tasks which are concerned with Hoshin Kanri (p. 289):

1. Set strategic priorities to focus on corporate direction
2. Align these priorities with action plans
3. Integration of priorities with daily routine of employees
4. Provide analytical review of the strides in strategic priorities

Thus, Tennant and Roberts (2001) suggest that planning and development forms a crucial part of Hoshin Kanri, this includes elements such as identifying targets, developing a plan to achieve these plans and implementing both creates a recipe for success.

Companies that are implementing Hoshin Kanri can do so by planning, auditing and executing (as shown in the figure below) its plans based on six factors which are: 5-year vision, 1-year plan, deploy to departments, detailed implementation, monthly diagnosis, and president’s annual diagnosis.
The Hoshin Kanri is very often compared to the PDCA cycle of continuous improvement with the inclusion of Presidential Annual Diagnosis, a summary report which confirms or re-defines the 5-year strategy plan of an organization.

Conclusion

The implementation of lean tools and techniques has been a major factor that has enabled numerous companies to succeed than ever before. There is a high rate of failure in the long term in such organizations. This failure is because many organizations mainly ignore the importance of focusing on the culture and the people they employ. To overcome these obstacles it requires companies to rethink their strategy of implementing lean and focus heavily on the culture and its people, as demonstrated by Tektex’s success. The purpose of the case is to educate the student about the need for visible and enabling factors that define the effectiveness of lean thinking in a professional setup.

The increased focus on culture has enabled multiple organizations such as Tektex in tackling tricky situations highly efficiently. It also brings into questions the traditional ways work study implementation and heavy reliance of lean thinking on tools and techniques. The literature review highlights the emphasis of culture on lean thinking and shows us ways in which companies can focus internally to transform difficult business situations. The theory and the research report findings regarding the journey of lean at Tektex indicate a balance between careful attention to people and processes.

The Evolution of Lean Thinking at Tektex – where to next
within the organization. Critical analysis of the case study reveals that it is necessary for an organization to persevere while implementing lean as the results are not very evident in the short run. Thus, management has to be patient and trust the lean system for long-term returns.
3. Methodology

The research paper undertakes the form of a teaching case, which is intended to document and replicate a real-world business challenge in the classroom context (Ellet, 2007). Vega (2013) notes that a teaching case should be designed with a view of sharpening the analytical and reasoning skills of students. It should also assist in developing their ability to navigate, articulate and address business issues, which are not always immediately evident (Corey, 1996).

Broadly, cases studies can be classified into six different categories as suggested by Yin (2003). They are primarily classified into three orientations namely “exploratory,” “descriptive” and “explanatory” (p. 5); each of them with either a single or multiple case version. These are illustrated in the table below (Yin, 2003):

<table>
<thead>
<tr>
<th></th>
<th>Exploratory</th>
<th>Descriptive</th>
<th>Explanatory</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single Case Study</td>
<td>Defines hypothesis for future studies with respective to a single case</td>
<td>Defines single real world scenario about its business context</td>
<td>One particular business situation is used to present new information</td>
</tr>
<tr>
<td>Multiple Case Study</td>
<td>Defines hypothesis for future studies with respective to multiple business cases</td>
<td>Defines two or more real world scenarios about its business context</td>
<td>Two or more business situations are used to present new information</td>
</tr>
</tbody>
</table>

The Tektex research report takes the form of a teaching case due to its descriptive orientation (Ellet, 2007). Also, this case focuses on the implementation of lean within a single firm, Tektex, and by doing so defines a single real world scenario about its business context. As discussed in the introduction to this research report, the narrative of the case is intended to stimulate understandings around lean operations and associated business challenges.
Case Study Content

The Harvard style of case writing has been used to script this case. The narrative in such a style of writing helps communicate multiple coinciding scenarios that effectively tests a broad range of knowledge (Corey, 1998). To this Heath (1998, pp. 81-92) identified four core elements that any researcher should ultimately acknowledge in their case study:

1. A smooth narrative
2. An interesting story
3. Interrelated dilemmas and incidents in a precise chronological order
4. Hints that guides readers to explore the underpinning theories

A standard and straightforward three-tier case structure have been outlined by Farhoomand (2004), in which the case has an opening, the body, and the conclusion. In the case opening, the context and the case lead is introduced. The body of the case tells a broader story, highlights the dilemmas and challenges while the conclusion combines the case and reiterates the significant challenges (Farhoomand, 2004).

As was emphasized, the narrative of the case study should provide the reader with ample data and information to help them reach conclusions and recommendations (Corey, 1996). Subsequently, a well-written case should include aspects that assist in stimulation the complexities of real-world business scenarios in a classroom environment; which can include unstated facts (Ellet, 2007). Corvey (1998), however, states that additional hurdles in a case often offer educational value, in that they assist the student in learning about real world complexity, but learning is obstructed as students have to spend additional time to examine irrelevant information.

The Tektex teaching has been composed keeping in mind the addition of layers of complexity and has a component of multiple overlapping narrative components, replicating the Harvard style of case writing (Heath, 1998) and subsequently avoid dumping of irrelevant information which prevents diversion of student’s attention from the key issues (Corey, 1998).
Case Lead Selection

Corey (1998) identifies several factors, such as topicality and cooperation of the company, which play a significant role in the identification of a suitable protagonist (case lead) for the teaching case. Tektex is a well-cited business in the media for the practices they have adopted in the manufacturing industry in South Africa. Furthermore, as the manufacturing unit of Tektex is based in Ottery, Cape Town, it was accessible, and the nonhierarchical structure made the selection convenient. An initial reach out to the General Manager of the manufacturing unit endorsed this notion, with the General Manager openly expressing his willingness to participate. Subsequently, Tektex was selected based on its relevance considering the teaching objectives identified in the initial meeting with the supervisor.

Research Design

Teaching cases are written to function as facilitators of learning by narrating real business challenges faced by an organization or an individual, with a particular scenario in point of time (Ellet, 2007).

Subsequently, Heath (1998) notes the descriptive purpose of the case must be supported by the research conducted. In achieving the above, requires extensive primary and secondary research that documents a recent professional scenario and its related facts, providing different perspectives enabling deep and detailed illustration of the business. It becomes essential to gather data from diverse sources that are related to the organization to create a platform of rich information.

Building on the above foundation, the Tektex case is appropriately intricate and capable enough to ignite in-class debates and impart intending learnings (Vega, 2013). Corey (1998) suggests a multi-level approach that includes two sets of research components. First, the researcher should begin with an initial in-person visit to identify the key issues and challenges; along with identifying the data sources and the appropriate interviewees. The second components include gathering secondary data to form the basis of the primary research which will direct the primary data gathering process.

The below diagram has been adapted from the work of Corey (1998), and a modified version of the process was followed in composing the Tektex teaching case.
Data Sources and Collection

There have been six sources of evidence that have been identified for building a teaching case study. There are sources include “documents, archival records, interviews, direct observation, participant observation and physical artifacts” (Yin, 1994; p. 41).

As highlighted earlier, the case methodology is descriptive in nature. Thus qualitative data was gathered using semi-structured interviews constituted the majority of the data collected (Ellet, 2007). Simultaneously, Corey (1998) indicates that the data should be collected using multiple sources which include but not restricted to interviews across various levels in the organization, financial & performance data, and media & press coverage. This broad spectrum of data provides a holistic and multi-faceted context for a well-structured case study. These interviews were preceded by secondary research which involved an in-depth analysis of the media and the press coverage for Tektex and the South African Textile and clothing industry.
Heath (1998) highlights the purpose of teaching case as replicating the real business scenario in a classroom environment, the process of data collection becomes very crucial in the course of structuring the case study itself.

In the case of Tektex case study, the following subjects of the Tektex team were interviewed:

1. Ronny Osborne (General Manager at Tektex)
2. Patricia (Production Manager at Tektex)
3. Edwina Arendse (External Consultant-Coach at Tektex and Managing Director at Tower Consulting)

The above represents the team involved in executive level operations-related decision makers. Ideally, the lean deployment team would have been interviewed more extensively, but tight time constraints did not permit.

As suggested by Yin (1994), these in-depth interviews were conducted in unstructured or semi-structured form. The researcher rather than directing the interview using a formal questionnaire guided the conversation using a semi-structured format that covered the central theme of the case without interrupting or influencing the responses from the respondents during the interview (Corey, 1998). In the structures interviews, there was a high emphasis on constructing a timeline of events which was then used to slice the case and formulate concrete learning objectives.

Furthermore, information was collected from company documents and observation of the factory floor. This information alone is subject to interpretation bias of the researcher. However, various measures were put in place to check the authenticity of the information gathered from multiple sources.

Data Analysis

After the data had been collected from the above-identified sources identified, the findings were then audio coded and analyzed to form the basis of scripting the narrative of the case (Yin, 1994). As suggested by Crichton & Childs (2005) audio coding was used for the interviews as it is easier for data management. This process is contemplated to be an integral part of the analyzing verbal data. The codes were predominantly bucketed into categories such as KPIs, culture, physical factors, intangible factors, internal factors and
Woodside (2010) suggests that to increase the accuracy and the complexity of the case, the research should use the diverse set of data and check the sanity of it by triangulation of the information. Triangulation was done within each data source and across multiple sources to ensure the authenticity of information.

Figure 7: Data Analysis Triangulation (Source: Woodside, 2010)

Woodside (2010) identifies seven different categories (numbered from 1 to 7 in the above figure) to classify case study research data. Groups 1 to 3, represent data collected from three different sources; while groups 4, 5 and 6 include overlapping data from two sources, and similarly, group 7 represents data overlap from all three sources. Gathering information in the latter categories as per the model enables the researcher to capture more accurate data and a holistic understanding of the business scenario being analyzed (Woodside, 2010).

Replicating the narrative and the information with accuracy is highly important to capture the true essence of the implementation of lean in the actual business situation of Tektex’s operations. However, due to strategic sensitivity and confidentiality of the business information gathered individual components of the narrative and the information presented had been adjusted in writing the case study. Yin (2009) highlights that as the resulting report is a teaching case doing the above mentioned is acceptable. He also suggested that
the research can manipulate certain aspects of data to ensure that the learning objectives of the case are met.

Lastly, to ensure that validity of the data, the case study was reviewed by the Tektex management to identify any discrepancy in the information presented in the narrative.

Teaching Notes
The learnings from the case should be indirect and tacit in the case. However, it should be explained thoroughly in the teaching notes of the case along with all the supporting information and evidence either in the case itself or as exhibits. (Farhoomand, 2004).

Corey (1998) goes on to say that teaching notes are “a contribution to education” (p. 8) and highlights that teaching notes should enable the readers of the case to clearly identify the major challenges raised by the case and suggest well though explanations and substitutions considering the relevant theory.

It should also be noted that the teaching notes of a case study should be suited to the educational objective, and make space for creativity to meet the learning requirements of the students in the classroom (Lapierre & Cardinal, 2003). Lapierre and Cardinal (2003) go on to suggest that the teaching notes should be based on the nature of the case, objectives of the case, the in-class discussion and in-class questions posted by the lecturer. With regards to the nature of the Tektex case as mentioned earlier in the report, the following elements will be used to formulate a framework for the teaching notes (Lapierre & Cardinal, 2003):

• Summary of the case
• Intended learning objectives
• Key questions and proposed solutions/alternatives
• Pre-Class and In-class Discussion guide
4. **CASE STUDY**

**Introduction**

JJ, the short-legged Jack Russell terrier, was as excited as ever to see Ronny walk into the office. Ronny, the General Manager at Tektex’s manufacturing unit, had just attended the 2016 yearly strategy meeting with Western Emporium’s CEO, along with the first level factory management of Tektex. He sat in his chair, and feelings optimistic about the strategy meeting. Ronny recollected at that moment how in 2004, 12 years earlier, managing even the basic operations at Tektex seemed like a mammoth task. Back then the focus was to improve everything that came in, through and under a machine’s needle. Ronny pushed everyone, from the assembly line staff to the floor supervisors with absolute power, to work harder and faster. As Ronny remembered those times, he had a grin on his face - it seemed like yesterday when still he believed that management orders were decrees set in stone. However, he was proven wrong when he was exposed to new ways of operating factories, ways which he had never learned during his experience as a work study officer. Though some of his old tactics had shown results; Ronny felt that a dynamic change was needed to accelerate the growth within the company. This change came in the form of lean manufacturing philosophy. He took a deep breath and looked out of the window from his office into the lobby, where he could see Patricia, the Production Manager at Tektex, and Edwina, the consultant-coach at Tektex, happily talking to each other. Ronny was proud of what the team had achieved at Tektex in the last decade. They had turned around a business on the brink of extinction into a business that presently defines the fashion trends for technical clothing in South Africa. However, he was humbled as he could sense there was a need for another wave of radical change at Tektex to accommodate the vision of the Chairman and the CEO. The prospects were both exciting and frightening. His CEO wanted Ronny, and his team to now start devolving the lean thinking approach to other newly acquired factory in the Western Emporium group. This in itself was a challenging and exciting prospect which needed careful thought. Ronny’s big fear was embedded in whether Tektex itself was ready for Ronny and Edwina to withdraw in a significant way, without any backsliding to old methods and behaviors. Were his people and processes ready to run by themselves? Ronny knew a lot needed to be done before the next yearly strategy meeting.
Tektex and Western Emporium

Tektex, a 35-year old manufacturing business, forms part of the Western Emporium. Currently, Western Emporium is home to numerous internal brands such as Khakee, Threading, Tunes, Kinders and Tektex, with Tektex being one of the most popular brands under the Western Emporium umbrella. It is known for providing a high-quality range of technical outdoor clothing and gear, offering everything that one needs for outdoor adventure sports. The group has always believed that Tektex is a brand that represents fashionable outdoor wear, which is an essential commodity for every adventure trip.

Western Emporium itself has had a rich history, with an over-83-year old legacy of trust, innovation, and passion. It was established by Arthur Kaufman in 1933. The business was initially set up on the corner of a busy street in Cape Town, South Africa, as an "army and navy store" and was recognized for the extensive range of products on offer. Operating in the same market as OK Bazaar and Woolworths, two of the largest retail giants in South Africa at the time, the management of Western Emporium soon realized they needed to distinguish themselves from competitors. The company chose to reposition and differentiated their product offerings, and adopted a conscious strategy of developing exceptional associations with their customers, along with selling an all-encompassing range of merchandise. The brand became so famous that it was believed that one could find anything from an anchor to a toothpick at Western Emporium.

During the first world war years (1914-1918), Western Emporium revised their product offerings and provided troopers passing by with several amenities and essentials required by the armed forces. They also catered to transcontinental fishers and transiting whaling ships, with an exclusive collection of products from across the world.

Post World War 2, Arthur’s son, Stephen Kaufman, took over the responsibility of running the business. It was during this time that the company prospered and became famous for non-seasonal and extensive product offerings by selling specialized summer attire to travelers traveling overseas in winter, and similarly catered to tourists with durable attire for the South African weather. With this extension, Western Emporium also started importing a few of the most famous world brands, including Levi’s Jeans, Hong Kong anoraks, Norwegian socks and Gore-Tex foul weather clothing, amongst
others. The move into technical textiles was achieved by the establishment of their production facility and brand - Tektex - in 1981.

By 2004, Tektex contributed 25 percent of the demand for Western Emporium, which had 50 stores, selling 35,000 units of clothing. Today, with increasing demand and unprecedented operational efficiencies, Tektex factory contributes almost 70 percent of Tektex clothing sold by the Western Emporium group, selling close to 500,000 units per annum in 206 stores.

In 2004 Arthur Kaufman (the namesake grandson of Arthur Kaufman Sr., the Founder of Western Emporium) hired Ronny Osborne to work with Tektex’s manufacturing unit. Ronny was employed with the mandate of streamlining Tektex operations and turning around the business from a loss-making situation into a profitable one. He was given three months to do this - by no means an easy task. Initially, as Tektex was on the verge of shutting shop, Ronny focused on making sure Tektex was producing a profit, or at the very least breaking even. Arthur wanted Ronny to focus on technological innovation for technical textiles, which he believed was the market need of the hour, and a possible solution to pull Tektex out of an untenable situation.

Though Ronny came from a clothing manufacturing background, Arthur presented a new challenge: streamlining technical textile operations. This was something which Ronny had not experienced before in his career. Born on 11 August 1961 in Harare, Zimbabwe, Ronny grew up in a family which had early exposure to the clothing industry, with his father being employed in it. In the 1980s, Ronny's father was employed with Truworths, Zimbabwe, as their Deputy Managing Director. In the same year, Ronny started his career in the clothing and textile industry at a factory named, Bonwit (the manufacturing arm of Truworths). Textiles, it seems, ran in his blood. As he quickly rose through the ranks, he occupied positions such as sewing machine mechanic and work study officer and became a consultant in the UK for developing a clothing standard times database. Between 1987 and 2004 he was employed by Kinross Clothing, Sweet Orr, Libro, and Karrimor. He ended this 14-year career period as the Factory Manager of Karrimor, a company manufacturing outdoor and sports equipment and clothing before joining Tektex. As a person, Ronny had a genuine passion for his family, people and the outdoors. He had always been enthusiastic about developing
local business to compete on an international platform. He firmly believed in and had worked towards, growing the local industries, and he focused heavily on "home-grown" talent development. Being a "never-say-no-to-a-challenge" person, he accepted the task Arthur presented him and rolled up his sleeves for what he knew would be a tough ask, not least because of the challenges regarding globalization and illegal imports that the industry was facing at the time.

South African Textile Market
The South African textile industry had evolved in leaps and bounds since the 1920s when only a few small companies in Gauteng and Western Cape were operating in the clothing and textile sector. In 1994, when South Africa became a democracy and opened its borders to global markets, the textile industry was one of the hardest hit local industries. However, the government had developed multiple strategies to counter the effects of global exposure after years of protection and helped to support and stabilize the textile industry. In the mid-90s the industry’s products ranged from expensive and high-value fashion tailored garments to inexpensive and mass produced essential clothing.

After 1994, the industry was struggling against the cheap imports from South East Asian countries such as China, India, and Pakistan. According to the Industrial Development Corporation (IDC), during those times the industry was also finding it difficult to deal with “insufficient investment, the slow adoption of new technologies, low productivity, labor-related challenges, skills shortages, inadequate firm level competitiveness, and limited access to credit.” Industry experts were also not highly optimistic about the industry’s future, as it was highly reliant on the backing of inter-sectoral competitiveness, amongst other factors.

Between 1995 and 2002, the clothing industry was burdened with high import duties, which were being phased down to World Trade Organization (WTO) levels. The situation worsened when China joined WTO in 2001 and flooded the South African markets with cheap textiles and apparel. At the time, illegal importation was one of the primary reasons for the decline in the textile and clothing the industry, reducing it to approximately 30% of its original size, before the rise of illegal imports.
With high import substitution, the number of job losses skyrocketed as the months progressed. In 2002, the clothing and textile industry employed approximately 181,000 people, but this figure fell below half in 2013, to nearly 80,000.

According to an IQ Business report between 2004 and 2013, the annual value added by textile and clothing industry had been highly volatile (refer to Exhibit 1). The industry saw a growth period in 2005, and then a significant decline in 2006, after which the industry seemed to have stabilized in 2007 to 2012, with smaller variations. In 2013, there was a huge spurt of growth due to the government’s commitment to strengthening the textile and clothing industry, a plan launched in 2009. The industry recovered due to the implementation of the South African Government’s Clothing and Textile Competitiveness Improvement Programme (CTCIP). According to the IDC’s report, “an impact analysis of the CTCIP scheme showed that, because of the CTCIP, the value-added manufacturing increase in the industry exceeded the value of CTCIP disbursements by 50 percent. Also, CTCIP participants created employment for 6,900 workers from 2009 to 2014.” This program was also pivotal in the establishment of both horizontal and vertical clusters which encapsulate the entire textile and clothing value chain, from fibers up to retailer outlets.

The South African textile industry recovered to its best position in decades. By 2013, the industry accounted for about 14 percent of manufacturing employment and represented South Africa's second largest source of tax revenue. Tektex was no less affected by the industry conditions than any other participants. Despite the severe economic and political conditions, Ronny and his team embraced these challenges head-on and pivoted to achieve excellence. They were determined to turn a dark situation into one of promise and hope.

**Tektex’s Lean Journey**

Tektex was one of the finest success stories of CTCIP. In 2014, the Tektex management confirmed that “its record of success and growth over the past few years was directly due to DTI assistance that allowed it to buy the best machinery available, turning around from the brink of collapse to becoming a highly profitable and stable entity, producing garments of outstanding quality.” Tektex, with the assistance of DTI, had
been able to double the scale of production, which was by no means an easy feat to achieve.

By 2016, the factory manufactured more than 200 types of products, ranging from their flagship technical jackets to smaller apparel accessories such as beanies and scarves (refer to Exhibit 2). In 2012, Tektex became the first manufacturer to introduce “sew free technology,” allowing them to produce waterproof clothing by using adhesives instead of threads. Since 2012, Western Emporium’s stores in across South Africa, Botswana and Namibia have accounted for 97 percent of orders processed at Tektex Factory, while the other three percent was attributed to corporate orders.

Tektex managed its business on multiple numbers of KPIs; two of which held the most value in the production function: production efficiency and on-time delivery. Tektex defines the former as the measure beyond which the factory was unable to produce additional garments without sacrificing production of another; and latter as a measure to gauge if the supply chain could deliver the required quantity and quality of garments to the customer in the mutually agreed timeframe.

When Ronny joined Tektex, the factory was operating at 40 percent productivity. This meant that for every clothing item which should have taken 10 minutes to manufacture, employees at the factory clocked roughly 16 minutes. As 2012 dawned, Tektex was operating at 75 percent production efficiency. However, there was a significant improvement as they ended 2015. Tektex was charting an efficiency of 120 percent, as employees took eight minutes or less to make the same garment. “Morale” was the only word Ronny used to describe the turnaround.

However, Ronny acknowledges that from 2004 to 2010, the team focused heavily only on improving the visible key performance indicators to revive the situation.

\[ \text{Loss in Efficiency} = \left( \frac{\text{Time Taken} - \text{Time Allocated}}{\text{Time Allocated}} \right) \times 100\% \]

Productivity = 100% - X%
Tektex’s current operating system and structures

Located on the edge of the Southern Suburbs of Cape Town, Ottery has been home to Tektex’s manufacturing unit since 1997. One would be surprised to see the small physical size (~3750 m²) of the factory compared to the production capacity of 500,000 units a year.

With the help of each of the department heads (refer to Exhibit 3), Ronny was able to organize the production control system (refer to Exhibit 4), which moderates the flow of information and material in the factory. This system combines the work of Tektex’s Planning, Production and Work Study Departments. Here weekly orders are taken from the customers, and a weekly forecast is provided to the suppliers for material needs. Production control is also responsible for managing the daily schedule, costing and daily target of each of the seven assembly lines in the factory. The production control department monitors the material inputs such as fabrics, threads, and zippers, among others, as they travel from design room to fabric store to the cutting unit. The inputs then go for sorting, from whence it goes for stitching - this process has multiple subprocesses which depend on the type of fabric being used for production. The finished product then goes for ironing, packing and is dispatched to the Western Emporium Stores and corporate clients.

The early days

In 2004, when Tektex was facing its darkest hour, Ronny heard about the formation of the Cape Town Clothing Cluster (CTCC). At first, he was not interested in this new concept as he had bigger internal operational challenges to worry about. However, in 2005, following the lead of other major textile manufacturers in Cape Town, Ronny decided to attend a seminar at CTCC. It was here that he was dazzled by the magic of lean in the textile space; he then encouraged Patricia, the Production Manager at Tektex, to attend similar sessions to make her familiar with the concept of lean as well. A “God-fearing” person, Patricia had done justice to her name as she was jokingly referred to as “Mother Teresa” at the Tektex factory. Patricia brought exceptional people management skills and extensive experience in the field of technical work study to Tektex’s lean journey. She joined Tektex in June 2004, with 13 years of expertise in the work study function in the textile manufacturing industry. She was appointed as the Production Manager in 2009, reporting to Ronny, and was given the responsibility for
planning and managing production flow and the quality of work. Also, she was tasked with ensuring that each production line achieved its targets through regular monitoring of work and follow-up on workforce and machine delays. Beyond this, Patricia managed most the training and development programs for the assembly line staff and was thus an indispensable part of the lean journey at Tektex. Not surprisingly, she shared Ronny’s passion and belief in growing and empowering the local talent. In 2005, Ronny and Patricia decided to build a team for lean deployment (refer to Exhibit 5). These initial steps helped Tektex to identify the major areas of improvement in the management systems.

**Focusing on KPIs (2004 - 2010)**

From 2004 to 2010, Tektex focused heavily on implementing changes to achieve better results at the factory, which Ronny and team refer to as “low-hanging fruits.”

**Production Efficiency**

During a distressed economy, Tektex was suffering from significantly low production efficiency (PE). Ignoring these operational inefficiencies was not an option. The low PE gave rise to further complications, such as lower raw material utilization, higher manufacturing costs, increased wastage, and lower equipment effectiveness. These were factors that were significantly constraining the Tektex’s business environment.

To counter this persistent problem of poor efficiency, the team looked at streamlining the workflow in each line of the manufacturing process. This required the team to measure the amount of time taken to complete a process with respect to the demand schedule of the product. For this, the team estimated the time available to achieve daily targets for the production line and computed it against the daily production target for each assembly line.

Next, the team carefully monitored the assembly lines to understand actual work that needed to be done to achieve daily objectives. To confirm the work, the team closely observed the tasks associated with production to understand the movement, location, time and sequence of the workflow. To sew high-quality garments, simple drawings of assembly line flow were made, and the location of trim parts and the materials required to sew a unit of a garment together were standardized. All of this was done in a way
that was uncomplicated for the assembly line employees. The team felt it was important, and always endeavored to use actual information and observation from employees who did the work every day, to completely understand what the current state of the work was. Thus, the assembly line employees were also involved as “work-experts” to provide highly specialized information while redesigning workflows.

While Ronny and Patricia were doing their observations, they also did extensive waste walks and developed multiple versions of value stream maps to identify bottlenecks in the operations and rectify them. They gathered information regarding the time taken by the assembly line to sew a specific unit of a garment. They visually plotted this information to understand the speed of the process (measured in minutes) versus the average number of garments demanded from the customer (measured in loads) and therefore determined the rate at which products should be produced. Lastly, to make matters simpler for the employees, every employee was provided with cleaner work areas and conventional materials they used in their respective processes, to enable them to achieve greater work efficiency. Finally, the team developed open communication channels, with the floor staff and scheduled daily 5-minute meetings and monthly meetings to address the concerns ranged from coordinating with colleagues on the floor to equipment issues they faced. Regardless the nature of the complaint, Ronny and Patricia listened with open minds, and always put an action plan in place, with a person and date responsible for delivering a response to the concern noted.

On Time Delivery in Full
Along with production inefficiency, Tektex was also facing perpetual issues with their customers not receiving finished products on time. The problem of on-time-delivery needed an immediate solution because it had ripple effects on the Tektex business as the demand from its customers was steadily growing. This issue also had negative repercussions on the inventory, machinery, efficiency and productivity at Tektex. The

\[ \text{On Time Delivery in Full} \]

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2 Each supervisor holds talks with their team and gives motivational talk, discuss machine issues and areas of improvement from previous days

3 Monthly meetings are held to give out reward and recognition awards, share information regarding state of the business, and improvements made to the factory such as buying new machinery
complication with their delivery schedule was a problem that consistently bothered the operations team at Tektex. It was identified that the customers had to wait much longer than anticipated. Operating in the highly dynamic and unpredictable fashion industry, Tektex either had to find a way to improve significantly or face the risk of going out of business.

In 2011, Tektex was still struggling to meet end demand, because the on-time delivery was hovering around 32 percent. Tektex was making what the customer wanted, but they were always late. Ronny understood that if they were successful in working out a solution to this problem, they would have an opportunity to improve sales significantly, reduce inventory, and enhance the ability to serve a larger customer base (in Tektex’s case, more Western Emporium retail stores and the odd corporate client).

The first line management team soon identified that the issue persisted because the suppliers and the warehouse were located at a distance from the factory in Ottery. Ronny, with the leadership's approval, decided to decentralize the procurement process. They built an in-house warehouse where high usage production material was stored so that there was less movement for fabric, reducing the lead time for the assembly line employees. For any ad hoc production requirements, the team started to back-calculate the speed at which they needed to produce to achieve their set on-time delivery targets. With constant reiteration, in 2015 Tektex ended off the year with an average of 96 percent on-time delivery rate.

**Getting everyone to work together**

Looking back, Ronny recalled that shifting KPI’s was a massive team effort that required all the heads of the department working together to ensure that no person or machine was idle. Analysis of their operating systems indicated that Tektex devoted 90 percent of their efforts on processes that accounted for less than one percent time of the entire journey of manufacturing the garment. They consequently shifted their focus from the needle point and involved the relevant head of the department who then went back and applied lean thinking in their departments. This eventually leads to the reconciliation of the KPI’s used to run the business. Ronny initiated “style meetings” which ensured that all heads of departments were aware of the production schedule and
all members of the team were literally and figuratively on the same page (refer to Exhibit 6).

**Changing Consultants (2011)**

While Tektex was on its quest to increase their operational efficiencies, they involved various consultants in implementing changes for advancements to their business. All the consultants focused heavily on implementing visible changes such as primarily new technology, tools, and techniques, or focused on better process management. However, Ronny knew that Tektex needed more than just visible correction. At one of the CTCC seminars in 2010, Ronny was introduced to Tower Consulting, a company that was assisting the cluster and its members in understanding the nuances of lean thinking. Ronny saw a new perspective to lean which he had not been exposed to yet - Tower emphasized heavily on the need for “enabling,” which meant that organizations should now shift their focus on the invisible factors that affect lean.

**Changing the Culture**

In 2011, with the increased involvement of Tower at Tektex; Edwina Arendse came on board to further streamline operations at Tektex. A Capetonian by birth, Edwina found her passion in the field of engineering at high school level. She later went on to study Mechanical Engineering, Business Administration, Six Sigma, Lean Enterprise & Executive Coaching. Edwina started off her career in the manufacturing industry in the maintenance department. She quickly progressed through the ranks from Maintenance Technician, Planner, Process Engineer, Continuous Improvement Engineer, Manufacturing Superintendent, Senior Industrial Engineer, and Business Coach, until being appointed Managing Director at Tower Consulting. A family oriented person, she had always dedicated her skills of facilitation, motivation, and organization to community work alongside her family for the past 16 years. She was always highly passionate about aligning people with process and presented great fit for Tektex and where they wanted to go.

Edwina helped consolidate the strides that Tektex had made with production efficiency and on-time delivery since 2004. She also ran her standard operational consulting models and mapped out the production system to determine the bottlenecks at the factory. She participated in tours of the factory with the management to identify...
wastages; this included pinpointing value-add and non-value-add processes. It soon
dawned on Edwina that the cause of Tektex’s problems was the neglected and
conservative work culture. She decided to focus on leadership and enhancing the
behavior and engagement with the floor staff. She also focused her energy on aligning
the Tektex vision to its strategy.

Edwina felt that Tektex lacked a unified corporate culture. The company had seen
successions of Chairmen, each one of them with a vision to create a business that was
based on values, and an inspiring culture that benefited all level of employees within
the organization. Even in times of distress when the company was suffering losses, they
reached deep into their pockets to keep Tektex afloat, as retrenchment was not an option
because of the family values embedded in a family run business. However, the
reciprocity from the employees was highly lacking. The floor staff felt detached from
the business, and it became challenging for the factory to perform and deliver when its
employees had an irregular and disengaged work ethic. This was evident due to the
high level of absenteeism, re-work rate, and reject rates at the factory.

The first level management was advised and equipped to change their ways of engaging
in the factory significantly. They worked towards developing a culture where
employees could be viewed and treated as trustworthy, and staff could take ownership
of their work. Accordingly, they focused on understanding the complexity of work from
the perspective of the floor staff and started educating them on the philosophy of lean.
Patricia believed that “if you can get buy-in from 80 percent of your employees, you
do not have to worry about the remaining 20 percent - they will follow”. She referred
to the 20 percent people as non-believers of the system. Production supervisors were
inducted into leadership development programs, and multi-skill training was conducted
to upscale the capability of assembly line workers. Ronny often faced skepticism from
his peers outside the factory on the training he invested in; his friends kept asking him
“What if you train your staff and they leave?” and he always replied with a smile “What
if I do not and they stay?” These were Tektex’s initial steps in the direction of creating
an organizational culture which could accept the change associated with lean
implementation, and in the long run, sustain it as well.
In 2011-2012, Patricia and Edwina conducted multiple workshops and training sessions to educate employees regarding the effects of absenteeism on the cost of the company and the employee benefits of reduced absenteeism. Easy to read posters were pasted all over the factory to iterate the importance of low absenteeism at work. The results of these initiatives were significant: while the absenteeism in 2004 was hovering around 8 percent, Tektex saw a gradual decline in absenteeism to 4 percent in 2013, which further reduced to 3 percent in 2014. By the end of 2015, the management could mitigate this percentage to 2.8 percent, and Tektex is on track to achieve 2.5 percent rate for absenteeism in 2016. Tektex was in line with the international industry standards of 2.8-3 percent.

As people started adopting the new culture on the floor, the re-work rate and the reject rates also started decreasing. The supervisors saw an increased ownership of the process by the employees. Eventually, the quality inspectors for each production line were taken off and trained to perform the value-adding process; the floor staff took the responsibility of checking the quality of their work. Auditors were assigned to do random 10 percent quality checks on an hour’s production, and another 10 percent check was done in the packaging department before final goods were dispatched. Due to these changes, the re-work rate improved significantly from 14 percent to 2.5 percent, and the reject rates decreased considerably from 4 percent to less than 1 percent in 2016.

With significant improvements in the company’s performance, it was time for Tektex to go all out in devising a strategic plan, which pivoted around continuous improvement. Tektex had achieved a high level of integrated lean thinking in the organization, from the production staff to the first level management team.

Current Challenges
Over the last 12 years, Ronny and Patricia were responsible for carrying the torch of lean implementation at Tektex. The factory had achieved success beyond their expectations; this ignited the interest and confidence of Western Emporium in Tektex’s journey. Western Emporium now wanted to improve operational efficiency at other factories in the group as they found themselves expanding and acquiring new businesses. The CEO and the Chairman informed Ronny and Edwina that they needed them to spread their expertise outside of Tektex into other factories of Western
Emporium businesses. This movement implied that Tektex would have to operate with less and less involvement from the Ronny and Edwina.

With this realization, Ronny explored the option of promoting people from within their current teams to devolve his responsibilities and ensure the upkeep of lean through the people working on the floor. He saw both excitement and reluctance from the potential supervisors. These potential supervisors, while excited about the prospect of the promotion, were worried about maintaining existing relationship with their peers on assembly lines. The transition for employees from the work floor to supervising was a tough one. Ronny acknowledged that being a supervisor at Tektex was a critical task, as they are the link between the floor workers and the first level management; these are the “go-to people” in the organization who are responsible for putting management talk into action. He also recognized that employees going through the transition would find themselves in unchartered territories, as they lacked the technical and leadership capabilities to cope with the expectations of the role. Ronny and the team feared that it would pull Tektex back to worrying about re-work and reject rates, targets, efficiency, and downtime – the same fundamental challenges they faced in 2004.

Ronny had recently heard, from industry consultants about the concept of Kata; however, he was wondering if this could be the solution for a way forward at Tektex. He also wondered how long it would take for them to up-skill the floor staff and teach skills and concepts that underpinned solutions. Ronny was concerned about the effectiveness of Kata, as the education level of the floor staff was low, as opposed to the education level in the automotive industry, where Kata historically was tried and tested. He was excited to take the learnings from Tektex and implement them at other manufacturing units of Western Emporium; however, he was also nervous and anxious, as a wrong move at this stage would push Tektex back to pre-lean times. He wondered what else he could do to make this transition happen in a way that maintained and improved on performance and processes.

With JJ’s tail repeatedly hitting Ronny’s feet, he was brought back to reality. He realized that half an hour had passed since he was contemplating about the issues by himself. Ronny got up from his seat and picked up the phone to set up a meeting with Patricia and Edwina to discuss a way forward.
Exhibit 1: Value-Add by the Clothing, Textiles, Footwear and Leather Industry

Figure 8: Annual Value Added by the Clothing, Textiles, Footwear and Leather industry and GDP, 2004 to 2013
Exhibit 2: Tektex’s product range

Figure 9: Tektex range of products

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Exhibit 3: Tektex Organogram

Figure 10: Tektex Organogram

The Evolution of Lean Thinking at Tektex – where to next
Exhibit 4: Material and Information Flow

Figure 11: Material and Information Flow

NOTE: The process of Sew Free 1 and Sew Free 2 is excluded for specific type of fabrics
Exhibit 5: Lean Deployment team

Figure 12: Lean Deployment team
Exhibit 6: Heads of Departmental and their contribution

Tektex operations can be bifurcated into eight departments namely Design, Human Resources, Production, and Dispatch, Planning, Raw Material - Trims, Raw Material - Fabric, Maintenance, and Strategic Projects. The departmental heads of each of the functions had an integral part in the evolution of Tektex’s lean journey.

1. Production and Dispatch: Headed by Patricia Abrahams, this department was the epicenter of action at Tektex. All departments at the factory act as internal suppliers to the production function. Patricia channeled her concentration on reducing the work in progress. She implemented the new layout of the dispatch (proposed by MBA students) and focused on minor details such as reducing re-work and reject rates. She implemented weekly incentives of “going home early” scheme and quarterly monetary incentives to reward employees with low absenteeism and late coming, and high-quality delivery and discipline, among others. This boosted the moral of the floor staff significantly resulting in better overall efficiency at the factory.

2. Design Department: Headed by Erik Ross, he focused on procurement of seasonal ranges in time. Erik was extensively involved in heading up pre-production stages meeting that reduced the change over time from 2 days to half an hour. He centralized his department and brought the sample room, pattern makers, and designer together and treated everyone like a team. Erik empowered his team by giving them dedicated machines to work. He spearheaded the pre-production meeting which helped reduce the wait time at the assembly line significantly. In sync with the design team, Erik introduced measures to record the supply of production ready samples instances which helped him reduce the quality defects and reduce wait time on the assembly lines.

3. Human Resources: Headed by Margaret Fisher, she turned her attention towards measuring absenteeism and conducting training and development programs along with Patricia, while calibrating staff turnover from a salary and the wage perspective. She also ensured the induction of every new temporary or permanent employee of Tektex. She, with assistance from Edwina, implemented the “return to work interviews” to ensure Tektex understood the commitment of their employees and instilled Tektex’s faith in them. This was a significant step in boosting the morale of the employees at
each level of the organization, resulting in higher quality standards and lower absenteeism.

4. Planning: Keith Hall steered the planning department, he introduced the Fast React planning board, and held regular meetings, while implementing an automated system to drive tasks and events to smoothen the flow of information and material at the factory. This helped increased coordination between internal and external suppliers, reducing the lead time and supplier instances within the factory.

5. Raw Material - Trim Store: Headed by Cornell Ryklief, he directed his focus on suppliers and started measuring their performance. He began having monthly meetings to report their performance on criteria such as on-time delivery in full and quality. This methodology was extended to measure inter-departmental performance, as the supplier to the production department. The measure of the above data brought to notice the supplier instances and direct actions were taking to address such issues, significantly reducing quality defects and waiting time on the assembly lines.

6. Raw Material - Fabric: Headed by Farhana Arnold; she played a vital role along with Ronny in decentralizing the location of the fabric stores. She took steps to ensure better management of stock by implementing first in first out concepts and managing redundant stock. Kanban system was introduced which enabled better utilization of space and improved the flow and reduced handling of fabrics between departments. These initiatives were accompanied by the supplier assessment which required monitoring and interviewing to increase accountability.

7. Maintenance: Headed by Grayston du Plessis; his primary focus was to reduce downtime and the response to downtime. He trained the mechanics to resolve technical issues quicker with instructions to mechanics that if they were unsuccessful in resolving a technical issue in less than 15 minutes, a substitute machine was installed to ensure smooth operations of the assembly line. This implementation saw a gradual increase in the number of machines in the warehouse. This move also enabled Tektex to reduce the wait time drastically at each assembly line and sustain the dynamic production requirements of its customers.
8. Strategic Projects: Headed by Akeela Kamroodien, she played a vital role in the success of the lean implementation at Tektex. She was the project coordinator, and she ensured all department heads were on track to measure and implement the action items discussed in the pre-production meetings. Akeela also provided a smooth implementation the ERP systems, facility upgrades and health and safety of all employees at the factory.
5. **TEACHING NOTES**

The teaching note has been stripped from this case.
For further information please contact the GSB Case Writing Centre.
6. REFERENCE LIST:


Lyons, A. C., Vidamour, K., Jain, R., & Sutherland, M. (2013). Developing an understanding of lean thinking in process industries. *Production Planning & Control, 24*(6), 475-494.


