

# IMPLEMENTING LEAN IN A HIGHER EDUCATION UNIVERSITY

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## ABSTRACT

Lean means creating more value for customers with fewer resources, by minimizing waste. Although traditionally this concept is applied in manufacturing, the Lean management improvement principles can be also applied in the case of educational institutions. This paper presents three case studies of implementing Lean in UK and USA universities that can be useful examples for implementing Lean in any university environment.

**Keywords:** *Lean, Lean management, Lean thinking*

## 1. INTRODUCTION

Lean thinking is a new paradigm that has become the foundation for continuous process improvement and excellence in manufacturing and service organizations around the world. Lean is focused on creating value through relentless elimination of waste [1].

A lean organization understands customer value and focuses its key processes to continuously increase it. The ultimate goal is to provide perfect value to the customer through a perfect value creation process that has zero waste.

To accomplish this, lean thinking changes the focus of management from optimizing separate technologies, assets, and vertical departments to optimizing the flow of products and services through entire value streams that flow horizontally across technologies, assets, and departments to customers.

Eliminating waste along entire value streams, instead of at isolated points, creates processes that need less human effort, less space, less capital, and less time to make products and services at far less costs and with much fewer defects, compared with traditional business systems. Companies are able to respond to changing customer desires with high variety, high quality, low cost, and with very fast throughput times. Also, information management becomes much simpler and more accurate.

A popular misconception is that lean is suited only for manufacturing. Lean applies in every business and every process, and in this paper we will refer to lean applied in the academia. It is not a tactic or a cost reduction program, but a way of thinking and acting for an entire organization. Businesses in all industries and services, including healthcare and governments, are using lean principles as the way they think and do [2].

In any business there are three types of activities:

1. activities that add value, are those activities which, from the point of view of the customer, make a product or service more valuable;

2. necessary activities that do not add value. In terms of the customer, such activities don't make a product or service more valuable, but from the point of view of the supplier such activities can not be eliminated;

3. unnecessary activities that do not add value are those activities that can be eliminated.

Lean concept refers to the effective management of an organization's production processes by eliminating waste, ie processes that do not add value and are not required.

The focus of Lean based management is on value, customer, efficiency and effectiveness, as well as savings, sustainability and increasing performance.

There are more steps to implement Lean in an organization including creating Value Stream Maps. Firstly, a current Value Stream Map is identified. That means designing a chart that includes all the necessary steps to go from receiving an order from a customer to the delivery of the required product. After that is drawn a future Value Stream Map, including opportunities for improvement identified through analysis of the current map. This step of implementing Lean, among other steps, is referred to in the following case-studies.

Lean reference list consist in works of James P. Womack and Daniel T. Jones (Lean Thinking), which is one of the earliest books describing Lean philosophy, Taiichi Ohno (The Toyota Production System: Beyond Large-Scale Production), Jeffrey Liker (The Toyota Way), Mike Rother and John Shook (Learning to See - Value Stream Mapping to Add Value and Eliminate Muda) and others like Don Tapping, Tom Luyster and Tom Shuker, Kevin J. Duggan or Kenneth Dailey.

Lean thinking is a relatively new concept in Romanian management literature, though there are several national authors that offer a personal perspective on Lean[3].

## 2. MODELS OF LEAN IMPLEMENTATION IN A HIGHER EDUCATION ORGANISATION

The following case study presents how Lean, a technique traditionally used only in the manufacturing business, is tailored to the particularities of the higher education processes and is implemented in an USA university.

### 2.1 The four-step model of Lean implementation at University of Central Oklahoma

The University of Central Oklahoma, located in Edmond, Oklahoma, has embraced the concept of Lean Thinking and was transformed in a Lean University due to several reasons: budget reduction, insufficient funding to cover mandatory cost increases, outdated administrative process, employee job dissatisfaction and low productivity levels. Lean Thinking was initially focusing on Administration processes but later expanded to other divisions. The primary focus of Lean implementation was to identify and eliminate waste from the product or service provided. Lean Thinking methodology was introduced through a comprehensive employee training program.

Before implementing Lean, the university had overworked limited staff with deteriorating morale. The administrative process was not customer service focused. In order to analyze the situation, the surveys made on focus groups concluded that the majority of issues were complaints based on non-value-added activities.

Training was provided to all administrative staff to create both a common understanding and cooperation for the Lean effort. Each administrative staff member attended a one-day introductory Lean class.

The model used to implement the Lean University™ at the University of Central Oklahoma is a 4-step model that has been proven effective in other types of organizations

Step 1: Identify the Opportunities - Complete an organization-wide diagnostic search for issues, problems and opportunities.

Step 2: Solution Design - Create a draft for success that involves all employees: training, mapping, and planning.

Step 3: Implementation – Use kaizen events, core teams, and metrics to implement and illustrate change.

Step 4: Continuous Improvement – Monitor performance after projects are completed.

For the first processes, the University outsourced the facilitator role to a Lean specialized consultation company. A Process Improvement office with a manager overseeing Lean processes has been added, which provided closer oversight of past Lean processes and the scheduling of future Lean initiatives.

Implementation of Lean started in holding informational meetings attended by all administrative support staff to provide a brief overview of Lean advantages and to explain the steps required to achieve the cultural change.

In step one was established a priority list based on the campus-wide surveys, acknowledging issues, opportunities and areas where immediate action was necessary to improve customer service.

In step two was offered Lean training and a Value Stream Mapping workshop to all administrative support staff. The training was focused on how can Lean be used in administrative, service and support type processes and at the workshop participants created a current state map and a future state map with priority changes, in order to visually illustrate the process.

In step three departments implemented changes in their process based on the maps made at step two. As the changes were implemented, the employees within the

process were explained those changes and the changes' effects.

Step four is still running and consists in looking for continuous ways to improve the work process and eliminate waste.

The overall impact of implementing Lean at the University of Central Oklahoma was the cultural concept that positive change can and does occur. Employees have realized that they have been empowered to make improvements that help the financial position of the university and that reduced their frustration and increased their productivity. Beside this benefit, though the effort was focused on improving customer service, there have been multiple instances of cost savings through project work (e.g. reduce annual paper costs). The activity of Purchasing Department was streamlined by changing the flow of processing purchase orders from a batch and queue methodology to synchronous flow. Also was improved student satisfaction regarding the improved services offered [4].

## *2.2 Analysis of Lean implementation in UK business schools and universities*

The second case study presents the analysis of Lean implementation in UK business schools and universities made by AtoZ Business Consultancy [5]. The study included a combination of Russell Group and non Russell Group research and teaching intensive organisations. The Russell Group represents an association of 24 major research-intensive universities of the UK. In 2010-2011, the Russell Group universities accounted for 72% of UK universities' research grant and contract income and 61% of all doctorates awarded in the UK [6].

The context of Lean implementation in the studied educational organisations consisted in government budget cuts and increased student fees. Implementing Lean had significant impacts like improving the culture of change, revising processes and practices and staff improvements concerning their work. Some of the main conclusions of the study are the following:

- Lean implementation in Higher Education is at a beginning stage and there is place for improvements;
- There are no "outsanding" examples of Lean implementation, but there are cases of good examples to follow;
- Limited understanding of Lean key principles
- Focus on project based activities around few processes which are redesigned and then not always revisited or monitored;
- Revised processes were one of the key successes of the Lean programmes, which would be sustained even if the Lean programme ended;
- There is the need to better understand customers and processes, in order to sustain Lean improvements over the longer term;
- There is scope for a better understanding of end-to-end processes to ensure that Lean was not seen only in terms of process-focused change but more in terms of a culture change in behaviours and attitudes;
- All organisations should consider developing internal capability in order to create

sustainability;

-Managers should learn how to challenge positively to further support a culture of continuous improvement.

### 2.3. *Implementing Lean at the University of Minnesota*

At University of Minnesota from the United States a five-step Lean implementation methodology was adopted.

Step one consisted in finding early adopters from nonacademic departments who have an initial interest or need to improve their processes.

Step two referred to establishing training materials that internalize lean principles to enable the organization better understanding Lean without defensiveness. Training materials included examples of lean applications in a university environment.

In step three was created a central improvement office that supports departmental leaders in their efforts to launch continuous improvement activities. The office has a strategic role in fostering replication throughout the university.

In step four were established three demonstration events scheduled six weeks apart. It was used a seasoned lean facilitator experienced in transactional process improvement for the initial demonstration events. The department head has to assign a continuous improvement (CI) coordinator to work with the seasoned lean facilitator, in order to assure that the event logistics run smoothly and all pre-event and post-event activities are completed.

Step five consisted in extending the effort of Lean implementation to other university areas after the first event was successfully completed and after were identified additional university departments that showed an interest in starting a lean initiative.

Once the early Lean adopters from the Minnesota university were identified and trained it is critical to monitor current implementation plans and encourage the next wave to learn the benefits of participating in these type of events.

The first and most important method is to communicate the results far and wide to many departments.

The University of Minnesota has an office of service and continuous improvement (OSCI), which operates as an internal consulting group to enhance service, value and efficiency at the university. OSCI has put together a lean user group that meets monthly on campus. This has provided a valuable way for people to come together and learn and share their experiences. OSCI also publish a quarterly newsletter to highlight the good work being done and the publication is disseminated to a large number individuals throughout the university.

Also, the university organize an annual quality fair useful for knowledge sharing and cross-unit collaboration that features more than 35 posters and breakouts sessions and attracts more than 1,000 attendees from across the university system. Staff and students from the universities, public sector and private enterprise are invited to attend this event of networking,

poster sessions and collaboration in an effort to discover ways to innovate and improve [7].

### 3. ANALYSIS OF THE PRESENTED CASE-STUDIES AND CONCLUSIONS

In this paper were presented three case studies of implementing Lean in UK and USA higher education universities. Going through these case-studies are identified several particularities for Lean implementation in the educational environment.

First of all, the common driver for implementing Lean is the moment when a crisis or an event that change the normal order of things occurs. In two of the case-studies presented, the crisis moment started once with the budget reduction. From this point of view, Lean implementation can be perceived as a attitude of response for the current crisis. But there should be taken into account that people have a natural attitude of people of resistance at change and this situation must be treated with great care. Leaders of departments must understand very well the benefits of Lean implementation and the steps of the implementation process in order to further communicate them to their subordinates.

Lean is a long-term customer oriented initiative of improvement and improvement ways must be found continuously.

A facilitator is needed to assure the right implementation of Lean. The facilitator can be a Lean consulting company, like in the case of Oklahoma University or a leader with experience in implementing Lean in other universities or similar organisations.

Revised processes are one of the key successes of Lean implementation and should be sustained even if the Lean programme ends.

An office of Process Improvement (Oklahoma case) or an Office of Service and Continuous Improvement (Minnesota case) must be added, with a manager overseeing Lean processes and responsible persons who analyze the completed Lean processes and who check up and observe the running Lean improvements. Such office should play the role of catalyst for Lean implementation and sustainable improvement and also should collaborate with other universities or similar organisations units to identify sustainable improvements examples.

The good examples with results of implementing Lean, along with Lean benefits must be communicated to all departments of the university.

In conclusion, there are many improvement opportunities that justify Lean implementation in universities. Problems may appear in understanding the need of Lean, as humans in general are reluctant to change, but good follow-up examples like the ones provided above help in establishing an adequate strategy that can contribute to the success of Lean implementation.

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