

## Executive Attitudes to Lean Management at the National University Hospital of Iceland

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### Abstract

According to definition, the term 'lean management' involves increasing value for a client at minimum cost. In order to reach that goal, companies and institutions must realise that the flow of the products and/or service needs to be increased throughout the whole value chain. All waste taking place during the procedure must be prevented, from the beginning to the end, as it is not enough to eliminate it only in isolated areas. It is therefore important to create processes that require less labour, space, money, are less likely to cause mistakes or flaws, and require less time when handling and dealing with products and/or services. The application of lean management is a different approach to labour efficiency, involving a diverse and lean journey towards improved operations, and is thus not solely a process. Lean management can be applied to any form of activity, and after implementing the methodology, new and goal-oriented work begins. The objective of this research is to examine the attitudes of executives to lean management and to answer the research questions:

- Do executives find that they have received satisfactory instruction and training in the methodology of lean management?
- Is the implementation of lean management showing results, in the view of executives?

**Keywords:** lean healthcare, lean management, service, organisation; management, waste

### I. Research Methods and Information Retrieval

Quantitative research involves measuring specific subjects where the objective is to explain or describe something particular, such as people's views or opinions, and the data is processed statistically (Cooper & Schindler, 2006). Quantitative research methods have developed considerably over the years, and from the beginning of the twentieth century became more common than qualitative methods in most fields of social sciences. Quantitative methods involve the collection of data regarding the attitudes of people to a specific subject, where emphasis is placed on trying to prove a hypothesis and support numerical information. The data in quantitative research is measurable and countable, and it is possible to interpret the whole from the sample. It is also possible to interpret results from statistics, and to rely on graphs or tables in order to explain, (Bogdan & Biklen, 1998; McMillan, 2008).

There is some risk involved in using a sample in quantitative research for the purpose of describing a particular population, as there is danger of the sample being too small in relation to the population and, thus, not reflecting the viewpoint of the population (McMillan, 2008). The participants in the research were 169 executives in an institution using lean management. The research was conducted in February and March 2015. The Likert scale was used with five questions. The Likert scale is the most widely used approach to measuring the subjective assessments people make. It is a five, seven, or nine point scale, examining the degree to which participants agree or disagree with a particular statement. The middle of the scale describes their neutrality, where the participants either agree or disagree (Bryman & Bell, 2003). The research contained 18 questions and was sent to 169 executives. A total of 83 executives answered the questions, meaning an answer rate of 49.1%. In order to do justice to the results of the research, the questions are divided into three themes, with each subchapter having a different title: *Instruction and Training, the Instalment, and Open Questions*.

## ***II. Lean Management***

A great deal of theoretical material has been written on lean management, but it has proved difficult to make a straight-forward definition of 'lean management' as a term. Lean management is a method which is used both as a tool and in administrative practices (Grabau, 2012). Lean management is a new approach to labour efficiency, as it involves a diverse and lean journey towards improved operations and is thus not solely a process. Lean management can be applied to any form of activity or work, and after implement the methodology, new and goal oriented work begins (Drew, McCallum & Roggenhofer, 2004).

Womack and Jones (2003) define lean management as a methodology where the purpose is to minimise the time and effort of clients by fulfilling their needs and wishes, and simultaneously increase the value of the company by preventing waste. Mark Grabau (2012) defines lean management as a term, methodology and tool which is used to create and return as much value to the customer as possible. Its purpose is to prevent waste, and at the same time to utilise all the knowledge and skills that employees possess (Grabau, 2012). The Japanese engineer Taiichi Ohno defines lean management as a methodology where the focus is on the time axis from the moment that the client places an order, until the product and/or the service has been paid for. The purpose of lean management is to shorten the time axis by preventing all waste that takes place while handling and dealing with the product and/or the service (Grabau, 2012).

These definitions of lean management involve increasing value for the customer at a minimum cost. In order to achieve these goals, companies and institutions need to realise that the flow of the product and/or service needs to be increased throughout the entire value chain. Waste in the process must be prevented, from beginning to end, as it is not enough to eliminate it only in some areas. It is thus important to create processes that demand less labour, less space, are less money, are less likely to cause mistakes, or flaws, and demand less time for handling and dealing with products and/or service (Lean Enterprise Institute, e.d.). There is no one right way of introducing lean management (Liker & Meir, 2006).

### ***The Origin of Lean Management***

Lean management can be traced back to 1894 in Japan and 1913 in the United States (Lean Enterprise Institute, e.d.; Liker, 2004). In 1894, Sakichi Toyoda, started operations in the textile industry. Toyoda was considered a great pioneer in the industry and his operations had the advantage of using highly sophisticated automatic electric power looms. Production was successful and the textile industry was extensive at that time in Japan. When Sakichi Toyoda was old, his son Kiichiro Toyoda took over operations (Liker, 2004). Kiichiro Toyoda studied engineering and was a great pioneer, like his father. He was very interested in understanding things and their nature. When Kiichiro Toyoda took over operations from his father, he started concentrating on the manufacture of cars, and the company was renamed Toyota Motors (Liker, 2004). In 1903, a man called Henry Ford established the Ford Motors company, which specialised in manufacturing cars. In 1913, Henry Ford began developing a production method which was thitherto unknown, and which he called 'flow production'. In modern times, flow production is known as an assembly line (Lean Enterprise Institute, e.d. –a).

In 1930, Henry Ford and Kiichiro Toyoda met for the first time when the top managers of Toyota Motors visited Henry Ford's company, Ford Motors. This was the first visit of many and the employees of Toyota were very much interested in seeing and learning about the production of the Ford Company. By having the opportunity to watch its production, Kiichiro Toyoda and his employees saw that the Ford Company focused on having a flow throughout the entire production process. The lesson was that instead of manufacturing one car at a time, a better utilisation was acquired by manufacturing each part that was needed in the car in a specific quantity, and finally assembling many cars simultaneously. With this method, the employees of Toyota saw that it was possible to minimise cost, increase diversity, quality, and efficiency, while at the same time meeting the needs of the customers (Liker, 2004; Lean Enterprise Institute, e.d.).

### ***The implementation of Lean Management***

When first implementing lean management, it is important to realise that there is no single approach to the method. Each company or institution that decides to implement lean management begins from their own 'square one' (Grabau, 2012). It is important not to expect too much at the beginning of implementation, but to set few but clear and well-defined objectives to increase the probability of successful implementation.

Having few but good objectives makes it easier for people to learn from the experience, to have a better overview, and to know what works each time and what does not. Organisation is important from the start, as is experience and execution, where each company and institution is in a unique position (Garban, 2012).

Experience shows that it is not worth implementing lean management in companies or institutions as a whole, but better to divide the company or institution into smaller units, or departments. In that way, it is possible to support the implementation, provide employees with the right instruction and training, and monitor the results (Garban, 2012). Preparation for the implementation of lean management is made in five defined phases, as Picture 1 describes. These phases involve defining, measuring, analysing, improving and controlling (Breyfogle III, 2008).

Define	Measure	Analyse	Improve	Control
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**Picture 1 – The implementation process of lean Management (Breyfogle III, 2008)**

According to Breyfogle III (2008), each phase has a definite purpose and value in the implementation.

- *Define:* A specific project group is selected at the beginning to take part in the implementation, and which will have training in the methodology of lean management. Implementation of lean management has begun by selecting the group. The position of the company is assessed according to production, management, values, attitude and behaviour. When implementation is started it is important that all those who participate in the project are well informed, irrespective of whether departments or companies are involved. This applies to all staff, including managers and general employees (Breyfogle III, 2008).
- *Measure:* When a project group has been established and the staffs have all been informed, the work area itself is visited to observe how things work. The origin of waste, changeability and instability in work processes is detected. From these findings the major phases of the project are defined, and the data required is identified (Breyfogle III, 2008).
- *Analyse:* The roots of waste and changeability are analysed and the company policy is defined. Criteria for results in the company are identified and formal discussions held with the staff about what they believe can be improved. An effort is made to begin immediately with the issues that can be solved easily, such as improving work conditions, or the flow of communication between staff. In lean management, a strong emphasis is placed on every staff member participating in the work, not only the managers, and so general employees assist in creating the future policy of the company (Breyfogle III, 2008).
- *Improve:* The future vision of the company is introduced and defined for all staff. Instruction and training in lean management is organised (Breyfogle III, 2008).
- *Control:* In the last phase, the focus is on supporting the executives of the company. There is follow-up with new work processes and care is taken to ensure that continuous progress takes place to prevent the stagnation of the company (Breyfogle III, 2008).

### ***Eight Types of Waste***

Lean management involves, as stated above, the prevention of all waste, and simultaneously creating and delivering as much value for the customer as possible (Garban, 2012). It can be said that waste is everything that increases cost, but does not deliver increased value at the same time (Drew, McCallum & Roggenhofer, 2004). The car manufacturer, Toyota, originally defined seven types of waste: *defects, overproduction, transportation, waiting, inventory, motion, over-processing*, and *waste*, but the theoretician, Liker, (2004) added an eighth type which involves using the knowledge and skills of the staff (*human potential*). Each type of waste has a specific definition:

- *Defects:* Defects are when something that has not been successful the first time needs to be repeated. Time is wasted in correcting something that is wrong, which involves the person concerned finding the fault, correcting it and repeating the process to monitor the results (Garban, 2012).
- *Over Production:* Overproduction takes place when more is produced than the customer required, and/or when production takes place too early so that the products cannot be used (Garban, 2012). In order to prevent overproduction, the quality of the production needs to be increased each time (Drew, McCallum & Roggenhofer, 2004).

- *Transportation:* Transportation is when a product (patient, sample, or material) is being moved without need. This takes place when work areas are badly defined e.g. If a patient needs to be transferred from Area A to Area B before it is possible to transfer them to Terminal C.

In order to improve the process, Area B would be eliminated so the patient was transferred directly from A to C (Drew, McCallum & Roggenhofer, 2004; Graban, 2012).

- *Waiting:* Waiting is defined as the time when the staffs are inactive and/or when the equipment is not in use. When staffs are waiting, value is not being created and unnecessary delay is formed. Waiting can, for example, be caused by delay in the delivery of raw material, technical breakdown in equipment, bad organisation in utilising work areas, or bad devices. It is important to concentrate on continuous work processes and devices in order to prevent all waiting (Drew, McCallum & Roggenhofer, 2004; Graban, 2012).
- *Inventory:* A great deal of cost is involved in having products in stock each time, in addition to the fact that there can be limited space available for stock products. Products are things that are kept in stock when production is completed, but which the customer has not asked to have delivered at the time in question. If a great deal has piled up in stock, products may need to be disposed of, such as expired pharmaceuticals. Overproduction occurs when production batches are too big and, thus, a company is left with stock. Better control of production batches needs to be secured in order to prevent stockpiling (Drew, McCallum & Roggenhofer, 2004; Graban, 2012).
- *Motion:* Unnecessary motion in the workforce or raw material within the work process causes waste. Unnecessary motion can, for example, be caused by badly organised work space, staff having to look for equipment/tools, or walk long distances between areas in order to be able to do their work. The work area needs to be better organised in order to reduce the unnecessary motion of the staff, as regards the distance between work areas, organisation, and access to equipment or tools (Drew, McCallum & Roggenhofer, 2004; Graban, 2012).
- *Over-processing:* This is work that is performed but does not pay off economically. This involves, for example, handling raw materials before production, or unnecessary quality control. In order to prevent overproduction, the work processes need to be reviewed thoroughly and the factors that cause over-processing eliminated (Drew, McCallum & Roggenhofer, 2004; Graban, 2012).
- *Unused knowledge and human potential:* Staff often possesses a great deal of knowledge and experience. Their knowledge and experience can usually be used in solving issues. It is thus important and to be encouraging (Graban, 2012).

Change management is as part of lean management. Change management is a very extensive concept which involves the approach to changing a current situation into a new and changed situation. A new situation impacts the behaviour and attitudes of organisational wholes, as well as those of individuals and groups. This is a method and methodology which involves controlling the implementation of changes, and thereby achieving the best possible conclusion in the most successful way possible (Kreitner, 2008).

The way in which organisational wholes develop influences company culture, and therefore the staff need to be assisted in coordinating, both their work within the organisational whole, and how they treat one another. The methods and approaches used involve the behaviour of individuals, and rely on methods in the fields of psychology, sociology, education science, and management theory. The chief objective is to strengthen interactions between people, such as trust, communication, cooperation, and giving support. Effort is also made to improve the understanding of the organisational whole and its objectives, and to explain the future vision better. It is also important to encourage staff to seek solutions to problems that may arise, increase the knowledge and ability of staff, and improve the work morale (Kreitner, 2008).

One of the foremost pioneers of change management was the psychologist, Kurt Lewin. His chief goal was to find solutions that would improve the human side of organisational wholes. According to Lewin, the change process is a certain learning process, both for individuals and groups, that requires an opportunity to realise the changes that have been implemented, and what influence they will have on people personally. It is important that people have the proper information about the necessity of the changes, as informing people means they have the opportunity to realise their own situations and develop the appropriate solutions (Hayes, 2002).

Lewin's key contribution to organizational change was the presentation of his so-called Freeze Phases Change Model. The change model is a three-phase model showing how to succeed by managing changes and policy through the behaviour of individuals and groups (Burnes, 2004). The three phases are *unfreeze*, *change* and *freezing*. Each phase has a specific purpose.

In the first phase, the groundwork is laid for the coming changes where the purpose of the changes is explained to the staff so that they understand the necessity. The more understanding there is about the necessity of changes, the more motivation there will be for making the changes work. The changes are executed in the second phase, and it is in this phase that support in the form of the instruction and training of staff is most important. The staff must have time to learn about the changes, obtain an understanding of their purpose, and get used to working with the changes. Consideration needs to be made for mistakes in this phase. In the third and final phase, stability is found following the implemented changes. The changes become part of the daily work of staff, following which they become a routine (Burnes, 2004).

One of the things that Lewin (1951) examined was the behaviour of individuals and groups, and his conclusion was that it is easier to change the behaviour of a group of people than the behaviour of individuals. What the group has over the individual is group thought, as one group can consist of many different individuals who can have similar attitudes (Hellriegel & Slocum, 2004).

Another well known theoretician in the field of change management is John P. Kotter who is best known for suggesting an eight-phase process for successful change management. To implement changes successfully, and to the extent that the organisational whole gains its objectives, is the biggest challenge facing executives today. Kotter believes that for changes to become successful, it is necessary to go through all eight phases. If this is not done, there is danger that problems may arise. According to Kotter (1996), the eight phases are as follows:

1. Establishing a sense of urgency
2. Creating the guiding coalition
3. Developing a vision and strategy
4. Communicating the change vision
5. Empowering employees for broad based action
6. Generating short-term wins
7. Consolidating gains and producing more change
8. Anchoring new approaches in the culture

### **III. Process, Analysis of Data and Discussions**

It is a big step for an institution and/or a company to begin the implementation of lean management. Implementation calls for various changes among the executives and employees. The establishment, culture and attitude of the employees must be changed. Various questions were considered of particular importance to the implementation of lean management at the beginning of this research. The purpose of the research is to examine the attitudes of executives to lean management where it has been in existence for a few years. We shall be looking for answers to the research questions: Do executives find that they have received satisfactory instruction and training in the methodology of lean management? Has the implementation of lean management yielded results according to executives? of the 83 executives who answered the questions, all said they had some knowledge of the method of lean management and 56 of 82, or 68.3% had very much, or relatively much knowledge of lean management. According to the science of change management, it is important for employees to be well informed about the changes and their purpose. The chief theoreticians of change management, Kotter (1996) and Lewin (1951) both note how important it is to establish understanding among staff, regarding the purpose of the changes.

The results reveal that 71 of 78, or 91%, had received instructions in lean management, but only 21 of 83, or 25% said they had received training in the methodology of lean management. It is thus possible to infer that the institution had introduced the method of lean management clearly to its executives, but that the training about the methodology needs to be improved so that executives are able to use it in their daily work. Although 25% had received training in the methodology, 58 out of 80, or 73% said they had participated in a reforming project where the methodology of lean management was applied. At the same time, it appears that the executives believed that participation in a reforming project is not sufficient vocational training in the methodology of lean management.

The way in which lean management is implemented depends on each individual company or institution. According to our results, the vocational training of executives needs to be improved for more successful implementation. It is often said that one should not intend too much to begin with, but instead make clear and well defined objectives (Grabau, 2012).

One idea regarding improved training is that each executive would take on one reforming project within their own organisational area, where the tools of lean management would be used. In this way the training would be more personal, the executive would experience the changes through the use of lean management in their own organisational whole, and the executive's motivation for the use of lean management would increase. The researchers also believe that when the general employees within the organisational whole, see and sense the changes, it is more likely that their attitudes towards the changes will be positive, compared to when the executive is pushing the changes without the understanding of staff. According to Womack and Jones (1996), it is important that all employees participate in the work, not only the executives, so that it is possible to utilise the knowledge and skills of staff within the organisational whole. It appears that 43% of executives agree very much or somewhat, about having had satisfactory training or instruction. It is clear, however, that vocational training needs to be improved, although the executives appear to be satisfied with the instruction offered by the institution. The researchers make this assumption from the 91% who claim they have been instructed in lean management, but only 25% who claim they had received training.

According to the results of the questions regarding training and instruction, the researchers believe that the institution is well underway in implementing the method of lean management. The researchers conclude, however, that it could be an advantage for the institution to have a better follow-up on the instruction. It would then be ideal for the executive to take on one project within his or her organisational whole, where the tools of lean management would be applied, and for a consultant to assist the executive during the process. According to Breyfogle III (2008), it is important to go through each phase in the implementation of lean management. The researchers believe that the institution did well in going through each respective phase, but that the last one, *control*, could be improved. The focus in that phase is on support for executives, and there is follow-up on new work procedures in order to enable continuous improvement. The researchers assume from the results that there is lack of support for the executives, as there appears to be insecurity about beginning the method because training is insufficient.

The researchers suggest two solutions for improving the training. They involve repeating the instruction and training programme for executives on the methodology of lean management as soon as possible after it has been introduced. Greater emphasis should be placed on more personal training and support with the purpose of enabling the executives to see changes in their own organisational whole. A consultant, who is either inside or outside the institution, would thus be of assistance to the executive, as needed. The executive would therefore control the changes in their organisational whole, rather than an outside consultant. Furthermore, general employees within the organisational whole become more active and see and sense the advantages of the changes. Is the implementation of the method of lean management proving successful according to the executives?

When examining the answers of the executives, it appears that they believe the implementation of lean management to be successful. This is based on the argument that more than half the executives were generally more satisfied at work after implementation started, and that 87.5% believed that the work procedures of lean management would become established and return better work methods of the executives. The researchers conclude from the executive answers that they are satisfied with implementation, and that they believe this method has come to stay, rather than being merely a fad, especially as the results of the effort are visible. This is in accordance with the studies of Kotter (1996) and Lewin (1951), where it appeared that it was important to instruct executives and staff in the results of the changes. According to our research, the executives feel informed about the results: 71 of 80 or 89% claim they have been informed about the results, and at the same time have been praised and seen the results of their efforts. This strengthens their belief that they are doing the right thing with their work unit, and simultaneously giving their staff more encouragement in their work. It is satisfying to see the diverse and objective answers which the executives gave to the questions, as well as to the open questions. This indicates that the executives have a generally positive disposition towards the implementation and the method, although it can always be improved. The researchers believe, however, that it is important not to read too much into the results and assumptions and superimpose them upon other institutions or other companies, because this research applies only to one institution and its executives.

#### IV. Epilogue

At the beginning of lean management implementation, it is important to realise that there is no single right approach. Each company, or institution that decides to implement lean management, has its individual starting point from where the journey begins, as well as an objective for the implementation.

The results shed a fairly good light upon the attitudes of the executives to the implementation of lean management in order for it to be successful, and what is needed to see the advantages of the application of the method, but support and training needs to be improved. It is important to ensure careful preparation of instructions to the executives, and also to take care that the executives are well informed about the results of the implementation, so they can share it within their departments.

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