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Norway Post puts its signature on Lean solutions

A case study on employees' lean awareness and perspectives

Idris Moalim Amin

Master of science in Business Administration

Acknowledgement

This thesis is a culmination of five years of study at the Norwegian university of life sciences(NMBU). The background for this thesis is a major in business management in the degree of Master of Science in business administration. The study was about Norway Post Ltd.'s lean philosophy. At the time of the study which was between January and August 2018, the company announced plans to reduce the number of post-delivery days from 5 working days a week to alternative working days a week from 2020. The basis for this decision as widely covered by the local media was the irreversible continued reduction of mail volume since the turn of the millennium. However, final word has not been said on the issue as the matter is in for debate in the country`s parliament.

It has been an exciting 5 years in which I learn't myriad of things. The time in NMBU has been fruitful both academically and otherwise. Despite the cultural diversity in NMBU, I have felt wanted and appreciated. I enjoyed friendship and sense of belonging unequalled by non-other. I thank all my teachers, classmates and the whole NMBU fraternity for their contributions in whichever way small or big and for making my stay happier.

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Abstract

Recent developments over the last 30 years have turned upside down the normal operations of post corporations worldwide. First, the general availability of the internet to the public from the 1990s and increased internet connectivity worldwide has resulted in customers switching traditional mail sending with more affordable and faster electronic mode of communication. Secondly, states have gradually opened post monopolies to competition through liberalization and deregulation politics. Thirdly, customers preferences have changed and with increased competition, it is exceedingly getting tough in satisfying and retaining customers. On the other hand, these new developments have brought up the opportunity for growth and renewal. For instance, while the mail side of post corporation business has irreversibly suffered because of specially digitalization, the parcel side of their business has been picking up because of increased e-commerce globally. As a response to this new status quo, post corporations are expected to carry out major structural reforms aimed at capitalizing on opportunities brought by these new developments while at the same time reducing negative side effects associated with them.

Going by recent trends(BAKSTAD, 2009a), some of the reforms carried out by post corporations include changing the way their businesses are managed. Some post corporations have for example turned to increasingly new popular modern management systems like the Japanese hailed lean management system to improve their performance and quality of their services. The lean management concept which can be traced back to the Toyota company of Japan uses the bottom-up approach to management. Unlike the conventional management systems where the manager was responsible for both diagnosing and prescribing solutions to emerging problems, in the lean system, the manager seeks help from his workers in both locating problems in the system and finding solutions to them.

This study aims at investigating Norway Post Ltd.`s lean management experiment. Specifically, the study aims at assessing Norway post employees lean concept skills with more focus on how much they know about the reason of implementing lean in their company, the lean concept tools and techniques used in their workstations and recognition of non-value adding activities and benefits of lean in their place of work. In addition, employees' perception of the lean concept based on their experiences with lean will be tested. The general aim of this study is to increase awareness about how crucial in assessing employees lean skills and perception is in a step towards succeeding with lean and retaining it.

For the study, a questionnaire was designed to assess Norway post employees` level of lean awareness(skills) and perceptions in five post distribution centres in Oslo. Before the questionnaires were dispatched, an interview with frontline leaders and other key persons were conducted to get an updated informed perspective of their lean implementation status. Frontline leaders helped in pretesting and adjusting the items in the questionnaire before they were dispatched. Descriptive statistics and statistical packages R and Minitab were used to analyse the results.

Results from the study show that even though employees could identify non-value adding activities in their workplaces and could recognize improvements that were achieved because of lean, they didn't know the tools and techniques that make lean work. However, the study also observed that they were differences between the distributions centres in terms of lean awareness. Further, the study revealed that employees` perception of lean as a concept and their working environment is good despite the existence of a few challenges connected to managerial styles, lack of enthusiasm for lean management by some leaders and challenges of doing lean in an era when the mail volume is constantly going down.

Based on this research, Norway post is recommended to re-evaluate their lean project with an aim of getting an in-depth understanding of the magnitude of the problems revealed in this study and possibly change something if new findings are consistent with this study. Further on, the thesis recommends an adjusted lean that reflects the unique challenges the company is facing.

KEY WORDS

Lean, lean awareness, employees' perceptions, digitalization, Norway Post, distribution units

Sammendrag

Utviklingen gjennom de siste 30 årene har snudd opp ned på den normale driften av postselskaper over hele verden. For det første har den generelle tilgjengeligheten til internett for offentligheten fra 1990-tallet og internasjonalt økt internettforbindelse resultert i at kunder bytter ut tradisjonell postforsendelse med rimeligere og raskere elektroniske kommunikasjonsmåter. For det andre har stater gradvis åpnet opp postmonopolene for konkurranse gjennom liberalisering og dereguleringspolitikk. For det tredje har kundens preferanser endret seg, og med økt konkurranse blir det svært vanskelig å tilfredsstille og holde på kunder. På den annen side har disse utviklingene gitt anledning til vekst og fornyelse. For eksempel, mens brevsiden til postselskapsvirksomheten har lidt irreversibelt spesielt på grunn av digitalisering, har pakkesiden av virksomheten tatt opp på grunn av økt e-handel globalt. Som et svar på denne nye status quo forventes postselskaper å gjennomføre store strukturelle reformer som tar sikte på å kapitalisere på mulighetene som følger av disse utviklingene, og samtidig redusere negative bivirkninger assosiert med disse endringene.

Som følge av nyere trender (BAKSTAD, 2009a), inkluderer noen reformer utført av postselskaper blant annet endringer i hvordan virksomheten deres forvaltes. Noen postselskaper har for eksempel skiftet til stadig mer populære og moderne styringssystemer, som styringssystemet Lean, for å forbedre økonomien og servicekvaliteten. Lean sitt styringskonsept, som kan spores tilbake til Toyota-selskapet i Japan, bruker et bottom-up-tilnærmet styringssystem. I motsetning til de konvensjonelle styringssystemene hvor lederen var ansvarlig for både diagnostisering og fremlegging av løsninger på nye problemer, søker lederen i Lean-systemet hjelp fra sine ansatte i både å finne problemer i systemet og løsninger på dem.

Denne studien tar sikte på å undersøke Posten Norge AS sitt Lean-styringseksperiment. Spesifikt tar studien sikte på å vurdere norske postmedarbeideres ferdigheter innen Lean-konseptet. Det fokuseres på deres kunnskap om årsaken bak implementering av Lean i deres organisasjon, om de Lean-konseptverktøyene og teknikkene som brukes i arbeidsstasjonene, og deres gjenkjennelse av ikke-verdiskapende aktiviteter og fordeler av Lean i arbeidsstedet. I tillegg vil arbeidstakernes oppfatning av Lean-konseptet, basert på deres erfaringer med Lean, bli testet. Det overordnede målet med denne studien er å øke bevisstheten om viktigheten av å vurdere arbeidstakeres Lean-bevissthet (-ferdigheter) og oppfatninger om Lean, på veien mot å lykkes med Lean og å ivareta det.

I forbindelse med studiet ble et spørreskjema utformet for å vurdere postmedarbeideres nivå av Lean-ferdigheter og oppfatninger, i ulike post distribusjonsenheter i Oslo. Før spørreskjemaene ble sendt, ble det gjennomført intervju med førstelinjeledere og andre nøkkelpersoner for å få et oppdatert informert perspektiv på deres Lean-implementeringsstatus. Førstelinjeledere bidro til å utprøve og justere elementene i spørreskjemaet før de ble sendt. Beskrivende statistikk og de statistiske programmene R og Minitab ble brukt til å analysere resultatene.

Resultater fra studien viser at selv om ansatte kunne identifisere ikke-verdiskapende aktiviteter på sine arbeidsplasser og gjenkjente forbedringer som ble oppnådd på grunn av Lean, visste de ikke hvilke verktøy og teknikker som kan få Lean til å fungere. Studien observerte imidlertid at det var forskjeller mellom distribusjonsenhetene i form av Lean-ferdigheter. Videre viste studien at arbeidstakernes oppfatning av Lean som konsept og arbeidsmiljø er bra til tross for noen få utfordringer knyttet til ledelsesstil, mangel på entusiasme for Lean-styring blant enkelte ledere og utfordringer ved å praktisere Lean i en tid hvor postvolumet går konstant ned.

På grunnlag av denne undersøkelsen anbefales Posten Norge AS å re-evaluere sitt Lean-prosjekt med det mål å få en grundig forståelse av omfanget av problemene avslørt i denne studien, og eventuelt endre noe hvis nye funn underbygger disse funnene. Videre anbefaler avhandlingen et tilpasset Lean-system som reflekterer de unike utfordringene Posten Norge AS står overfor.

Nøkkelord

Lean, lean kjennskap, medarbeiderperspektiv, digitalisering, Posten Norge, distribusjonsenheter

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Pictures showing situation in one of Norway Post Ltd.`s distribution centre before and after lean was implemented. Picture on the left shows situation of the distribution centre before lean while picture on the right shows situation of the distribution centre after lean was implemented. Source: An anonymous lean navigator who works in Norway Post Ltd.

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1. Introduction

Reacting to a news on the possibility of reducing the number of post-delivery days to only one day a week in the future, Norway Post Ltd. employee Anja Frammarsvik answered Norwegian Broadcasting Corporation(NRK) digital reporter ``***Soon or later we are going to lose our jobs but we will continue delivering post as long as a mail is being sent***`` (Ekanger, 2018).

Postal services just like many other sectors of the society are feeling the heat of digital revolution. Society is being digitalized something that cannibalizes the core business of Post organizations across the globe. Customers are dropping the traditional mail in favour of the electronic mode of communication which is more rapid, quicker and with almost zero costs compared to the traditional mail which needed envelope and stamps in addition to taking time before reaching the receiver. At the same time, the cost of delivering the mail and other postal operational services are either remaining stagnant or increasing.

A closer look at the challenges facing the post organizations depicts an Armageddon situation. A dark cloud seems to be gathering over the horizon. While the mail volume is dwindling, many others are entering the market thanks to the liberalization and de-regulation politics which is getting momentum across many countries something that further shrinks the little remaining market. Customers who seem to be the winners in this situation feel more empowered than ever before- with more market actors to choose from.

What these new market dynamics mean is that established organizations (like national post carriers) must change gear and try new ways that can help them not only survive but also thrive. Going by recent trends, many have already taken new strategic moves to remain competitive by for example re-examining approaches to management and trying new ways like the lean management system which hails from Japan and the Toyota company. In it is best, the lean system helps adopters to cut down costs, retain customers and improve performances. But various studies have shown that many companies are struggling to integrate the lean management system into their own culture and reap from it is benefits. This failures by many to convert it to success has attracted the attention of both the research community, media and practitioners. A quick search on google returns thousands of studies, news articles, discussions on lean something that probably show the magnitude of its parallels. Many are trying to figure out what is it in the lean-the concept itself or

adopters that that makes it hard to work and stay as expected despite lean management system potential to help adopters to cross the bridge from yesterday(traditional) to new globalized and privatized world being scientifically proven. (Hines et al., 2011, p 10) for example mentions that the reason many companies don't succeed with lean is that of `` lack of knowledge, confusion, negative perceptions, lack of commitment from leadership etc.``

This research will focus on the first three factors mentioned by Hines that can inhibit the success of lean. In this research, the first two factors (education and confusion) will be bundled together as awareness and the third one-perceptions remains the same. The company of study is Norway post company which has had lean for the last decade. Despite having lean for all this long and being the most recognizable brand in the country, the company`s lean system seems to have gone under the radar of both the media and the academia. The closest academic scrutiny of the company`s lean system was a qualitative research on ``frontline leader's role in transformations with respect to competence and motivation`` (Haraldsen & Haraldseid, 2014) and no earlier research on company`s employees lean awareness and perspectives as far as the researcher can establish for now. Accordingly, this paper fills this gap in research by carrying out a comprehensive study of the company`s Lean system with special focus on employees' level of lean awareness and perspectives. Internationally, I have found two previous research on lean awareness which this research got a lot of inspiration from. There is one ``on lean awareness and implementation status`` carried out by Virginia Tech university students in USA(Fricke, 2010). The other one is `` lean awareness and potential for lean implementation in Qatar industries``(Salem et al., 2016). The Virginia Tech study found that lean awareness is good in the wood industries while the Qatar study found the opposite in the petroleum industries. The difference between this study and those mentioned is that while they both focused on comparing industries, this one is only on one company`s employees level of lean awareness and perception.

A study on employee's lean awareness is important because lack of or insufficient knowledge of employees' level of lean awareness (knowledge of tools, their practical use and misconceptions about essence) has been mentioned to hamper the success of lean(Hines et al., 2011; Hobbs, 2011). Emphasis on employees knowledge and opportunity for learning in a lean environment has been mentioned to create active participants with the

ability to fully participate and ``contribute ideas in lean`s self-managing teams`` (Sterling & Boxall, 2013, p 229)

Employees perspectives in lean settings are vital because research shows that there is a correlation between employees overall satisfaction and firm`s performance(Van De Voorde et al., 2012). Another study via proxy asserts that a change can only be sustained if is supported by the workers(Hoelsæter, 2016, p. 2). (Hines et al., 2011) says that employees ``just like appliances need constant maintenance for them to continue functioning`` He says that humans are complex in nature and hard to predict and without proper greasing and attention can abruptly without notice change perceptions and cause damages. Their perceptions are important because they inform their perspectives of the project-lean in this situation.

Based on these two discussions above, this paper aims to carry out research on employees' lean awareness and perceptions which inform their perspectives.

1.2 Objectives of the study

The objective of this study is to 1) Examine Norway post employees level of lean awareness 2) Understand employees' perceptions of the ongoing lean project in respect to benefits associated with lean implementation, factors that can hinder proper participation for instance managerial issues, empowerment, work environment(satisfaction). The overall objective is to encourage lean organizations-both new and established to develop a culture of learning where measurements and evaluation of employees' lean skills and perceptions are done routinely to see whether there is need to change something to make their lean philosophy work and stay.

This brings me to the research question which is**: Do Norway post employees have enough lean skills to fully participate in the lean project? And what is their perception of lean?**

To get a comprehensive understanding of the issue, I have formulated the following research questions.

I- **What are the employees` level of lean awareness?**
Here, awareness means employees level of lean tools and techniques recognition that is necessary for carrying out day to day improvement work. In addition, recognition of lean deadly wastes and improvements so far related to the elimination of the wastes will be tested.

II- **Does the level of lean awareness depend on which distribution unit employee belongs to?** This question is related to the first question. It tastes whether there are differences in the level of lean awareness between different distribution centres in district 2.

III- **How is lean perceived by the employees?**

As discussed in the introduction, employees' perspectives can affect a firm`s performance and sustenance of transformational changes. Accordingly, employees' perception of factors leadership, empowerment, satisfaction will be tested to see whether the right perception needed to enhance performance and sustenance of lean project is there.

1.3 Delimitation

This research is about Norway Post Limited's lean philosophy with a special focus on employees' level of lean awareness and perceptions. Due to the size of the organization and the reality of delivering the master thesis in time, the scope of the study will be reduced to the mail division of the company that is responsible for collection, transport and delivery of post. Further on, only five post distribution centres based in Oslo will be studied. In this scenario, the possibilities of generalizing findings from few post distribution units based in Oslo to represent all post distribution units of the company that are spread across the country will heavily shrink but it is expected that the number of units studied will be representative enough for all distribution centres in Oslo.

1.4 Research outline

The research has six parts including this introduction part that shows events that lead to Norway post adopting lean services, research objective and its significance as well as research questions. Part two covers theoretical foundation which forms the basis of the research questions and analysis. Part 3 covers the research method used, then followed by part 4 which is the presentation of the case object. Part 5 is a presentation of results. Part 6 is discussions, conclusions and reflections on shortcomings of the study and proposals for future research. Part 7 and 8, the final parts, cover list of references and appendices respectively.

2. THEORITICAL FOUNDATION AND PREVIOUS RESEARCH

2.1 Lean

The popular term-Lean spread to all economic spheres and business corridors like bush-fire around the world after the publication of the 1990s bestselling book `` The Machine that changed the world`` by MIT academics Womack, Jones and Rose. It was, however, John Krafcik who coined the term in his 1988 article `` Triumph of the Lean Production system``

The concept which was previously widely practiced in the manufacturing sector to solve the queue and batch problems has recently made significant inroads into many new sectors that were previously thought to have operating systems that were incompatible with the lean application. You can now hear of lean banking, lean insurance, lean start-up, lean hospital etc. Through lean, implementers got better ways of identifying and eliminating wastes in their processes. In lean`s world, a waste is identified as any activity that doesn't add any value in the process of serving the customers (Womack & Jones, 1997). The lean`s Muda principle which stands for waste lists the possible areas in which waste can be identified and eliminated as shortening the transport distance, reducing unnecessary movements, chasing after mistakes and defects and reporting them, reducing waiting time, avoiding overproduction, having correct inventory size and making good use of untapped knowledge of workers etc.

The contemporary Lean management system can be traced back to the Japanese automobile company Toyota. In the immediate post-war era where there was huge resource deficiency, it was exceedingly getting tough for many companies especially in Japan to produce high-end goods that were also customer wallet friendly. The Toyota company and its chief engineer Taiichi Ohno initiated a new company-wide solution they called Toyota Production system. The ambition was to produce a well-designed high-performing reliable state of the art vehicles that the average customer could afford using the scarce resources available. Unlike the Mass-producers of the time like the American Motor-car company Ford, who banked on scale economies to lower the unit price of their goods, the Toyota Production System(TPS) emphasized on relentless pursuit of eliminating waste in their processes and in the process creating a system that was efficient, cost-effective and had

extra capacity to attend to the special needs of the customers and finding new markets for their products (Elias, 2016)

The key driving force behind the waste elimination process was to spend less on everything. According to George Roth, the company was to reduce resource and time wastes by using ``half the human effort, half the manufacturing space, half the investment in tooling, half the engineering hours, and half the new product development time of mass production factories``(Roth, 2006)

2.2. A Minimalist approach to wealth creation

Of lean system, Hobbs(2011) said that `` by design, the lean enterprise is a minimalist organization``. The literature on minimalism shows that the word is entirely used to mean how people organize their daily lives. As in getting rid of everything you don`t need and keeping those that you really need or are important to you. Brian Gardner(2015) defined minimalism as ``making decisions based on what you need instead of getting everything you want``. He talked of getting rid of unnecessary things in the house to create more space, clearing all unpaid bills and bending issues so that you may focus your energy and time for important agendas, buying only what you really need and, in the process, reducing your costs etc. This line of thinking sounds familiar with the lean way of doing things. In lean, the focus is on using less space(inventory), less human effort, few tools and less time etc with the aim of producing the best with the utmost minimum cost possible (Roth, 2006)

While minimalist focus more on defining on what is valuable for yourself and eliminating those that are less valuable, leannist focus more on what is valuable in the eyes of the customer and from their getting rid of those that don't add any value in the provision of goods and services to the customer. In addition, the primary goal of why a company goes lean is not just to save costs but to increase their competitive advantage by doing things better than their rivals through for example product differentiation by showing to the customer that they can deliver faster and better quality products that is still wallet friendly compared to their competitors(Hobbs, 2011). Nevertheless, despite the glaring differences mentioned , travelling people through minimalism based on their daily lives for example getting rid of extra wardrobe or removing winter shoes away from your door entrance and putting them

in store until the next winter to keep your entrance nit and tidy could be an easy way to introduce lean to people for research shows that there is still confusion about the term(Elias, 2016). In new lean organizations, minimalist approach examples from daily lives as explained above can be used to make people understand how the 5s method (explained under the tools and techniques) works.

2.3 Employee driven waste identification

According to an article written in Norwegian language in 2008 by Ståle Lindblad available at http://www.forretningsprosess.no/lean-en-filosofi/, which refers to previous research studies on the level of wastes at organizations` workstations and processes shows that up to 85% of activities carried daily at workstations are non-value adding meaning wastes in accordance with lean philosophy`s definition of what a waste constitutes . He points out that there could be an obvious bias in generalizing all organizations for they are not the same, but the key issue here is that there is a widespread waste in the processes and that `` the potential for improvement is very high``

The goal of lean organizations should as such strive to identify wastes in their processes with help of the lean tools and methods. As earlier mentioned, the Toyota company and it chief engineer Mr Ohno have zeroed-in the waste areas into seven categories which are usually used as a reference point by many lean companies striving to identify and eliminate waste in their processes. Below is the original 7 waste list written by Engineer Ohno and an extra one from the scholars of Lean.

Overproduction- Waste occurs because supply supersedes demand. Usually occurs in a push system where the company produces and stores large quantities hoping that customers will buy everything. If the frequency of the production and size of quantity produced doesn't much with the frequency of buying and quantity demanded by customers can this create huge problems for the producers since they must store the product. This will increase the need to have large stores to cater to the excess and the cost attached to it will be high. The extra quantities that customers won`t buy anyway will ultimately go to waste

but their material cost and other indirect costs will remain the same. This is a perfect example of resource wastages(Hoelsæter, 2016, p. 9)

Over-processing- This type of waste occurs because up streamers make things beyond the standard required by the down-streamers. For example, adding a lot of unnecessary features on items something that can scale up the costs upwards for example extra inspection, rework because the customer will ultimately reject the product because of poor design or specification etc. Or use a lot of money in processing a product that will ultimately be sold cheap or can`t be sold expensive anyhow because of the market forces and demand.

Transport- Transportation usually doesn't transform the goods transported hence doesn't add any value to the product that the buyer is willing to pay for. As such it is categorized as waste. Furthermore, the longer the transport distance the higher the costs attached to the goods and the chance for damages and defects occurring becomes more. The goal should be a shorter transport distance.

Inventory- This type of waste occurs especially in push systems where raw material or finished goods are waiting idly in the warehouse waiting for signals from the next processes which can take a long time or never happen altogether. A lot of cash can be held up in the process which can create a liquidity problem for the company. These idle materials hold up cash and the same time occupy space that cost fortune is categorized as form of waste.

Un-necessary movement- Occurs usually at workstations that are not organized. The time spent by workers looking for something that doesn't have a fixed storage place or that necessary equipment for work is not put in one cell or near to each other is categorized as non-value adding activity to the provision of service and goods in the eyes of the final buyer.

Defects- This category of waste occurs especially when there is a lot of rework going on because of workers not getting it right for the first time. The rework will mean extra costs that buyers are not willing to foot therefore this will be a perfect example of waste as this

will require more time from workers something that could have been used in other activities that add value to the product like marketing and selling time.

Delays and waiting – This can, for example, occur when the process flow is either slow or comes to a standstill meaning that a lot of time gets wasted waiting for a signal from the next process which may take a long time. A typical example is where information processing and flow is very poor. The net effect will be keeping goods for a long time than necessary something means extra costs and therefore this is categorized as waste.

Workforce competency- This wasn't part of the original 7 waste Toyota worked with. Scholars have later added untapped employee skills and creativity as a form of waste. Besides from variation in personalities, employees at workstations usually have a different level of experiences and knowledge that companies can benefit from. For example, a junior employee with management experience from a previous job helps the company mitigate a certain complex problem using his earlier experience as a reference. Companies inability to know and capitalize on the capability of their workforce is viewed as the main reason why this type of waste occurs.

2.4 Womack and Jones`s 5 principles of waste elimination

The co-authors of the 1997 book `` Lean Thinking`` MIT researchers James Womack and Daniel T. Jones list five principles which they say should guide the process of resource optimization which encompasses waste elimination(Womack & Jones, 1997)

1. **Value-** The value of the product and services should be seen and understood from the customers` point of view.
2. **Value stream analysis-** After understanding what the value is from customers vintage point, the lean organization should start to map out activities that add value or those that don't in the eyes of the customer and thereby filter out the non-value adding ones.

3. **Flow-** The prime focus should be continuous flow rather than keeping large quantities in the supply chain which can create bottlenecks if demand fluctuates or process stops for one reason or another
4. **Pull-** Only a signal from activities downstream (customer needs) should trigger a response at the upstream side. In short, no work shall take place unless order comes from downstream(customers)
5. **Perfection-** The pursuit of eliminating wastes should be a continuous process rather a destination or a final result (Andersson et al., 2006, p. 288)

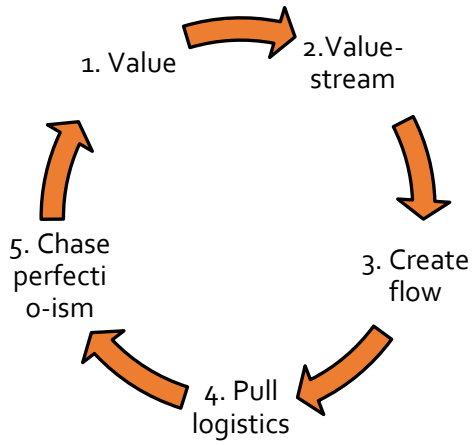

FIGURE 1: ILLUSTRATION OF LEAN PRINCIPLES BASED ON WOMACK AND JONESBOOK(1997)

2.5 Liker`s 14 principles to a management approach

In his 2003 book, The Toyota way (Liker, 2003), Liker describes 14 ways (principles) based on Toyota`s TPS of which if embraced can increase the odds for any company in succeeding with their visions and goals. The 14 principles are categorised into 4ps-which mean philosophy, process, people and partners and problem-solving. The four categories are summarized below. For thorough understanding of all the principles,(Panneman, 2013) can be read.

Category 1- Long-term philosophy

This category touches on how a decision should be managed. It encourages managers to base their decision on long-term view rather than short term. In essence, this means the goal should be growth and expansion rather than quick short-term gains as indicated by KPI`s and other measures(Panneman, 2013). Panneman indicates that the overall mission of the company should be steered by its drive to contribute to the overall economy, employees' wellbeing as well as its long-term growth. If the long-term essence of the mission can create the perception of taking care of employees and other interest groups, this can probably help in aligning everybody on the way to achieving the overall goal which is to increase performance.

Category 2- The right process will produce the right results

This category has the highest number of principles (5 altogether)- Here, Liker basically describes how the lean tools and techniques can be used systematically to get the intended results. For instance, carrying out Kaizen's (continuous improvements) to relentlessly chase and eliminate Muda's (wastes). Creating pull systems to prevent unnecessary bottlenecks and huge inventories that hold up cash that could be used for something more valuable like new investments etc. Going Gemba's (action epicentre) to see and document and then create standards through consensus. Other principles in this category are levelling of workload(Heijunka) to ensure people and processes are not overloaded(Fricke & Buehlmann, 2012) and creation of standards based on best practices after all other principles have been applied. Next is category 3 which handles on employees and partners.

Category 3- Add value to your organization by developing your people and partners

This category touches on three things namely- leaders, employees and partners. The gist that we can drive from Likers description of these three factors is that for a company to reach its planned targets, it needs to invest in its employees' development (skills and capability development). Simply put ``Employees are seen as the greatest asset of the company and investing in employees development should be seen as investing in the company`s future``(Fricke & Buehlmann, 2012). Liker says a company should invest in leadership that thoroughly understands the given task, carry out the tasks as envisaged by

the company`s philosophy and then do knowledge transfer to those under so that the results are achieved through a correct process that is in line with the company values. Finally, the company should invest in its partners` development since their success will play a vital role in securing your own company`s long-term development targets. In this, he says through proxy`` partners and suppliers should be treated as an extension of one's own business``(Fricke & Buehlmann, 2012). Next on focus is the last category which handles on problem-solving

Category 4- Continuously solving root problems drives organizational learning

This category basically talks about the process that leads to the creation of standards. Before standards are set, it is encouraged that those who have the final say on the issue (i.e. leaders) should go and see it for themselves to get an insider view of the extent of the problem. Before decisions are reached, many problem-solving options should be weighed in and final decision based on consensus with them to be affected reached. (Panneman, 2013) says that consensus with them to be affected (employees) is vital because without their consent the new standard or system will be short lived. This line of thinking is same as the view we have seen in the introduction part that indicates that `` only change supported by employees will eventually get sustained``(Hoelsæter, 2016).

This research about employees lean skills (awareness about the essence of project, tools, recognition of wastes etc.) and employees perception. All these 4 categories are important for this research because the research is basically testing category one (do they understand the purpose?), three (do they have enough lean skills?) and four (are they involved in decision making (their perceptions)?) and the outcome from these three categories(1,3 and 4) based on empirical evidence gathered will help shade light on whether category three (right process gives results) is being followed. For the sake of this research, the tested categories (1,3 and 4) are considered to be the correct process to get results (category 3). Overall, to get the correct results, the following framework has been conceptualized based on contextualization of Liker`s 4ps to fit into this research purpose.

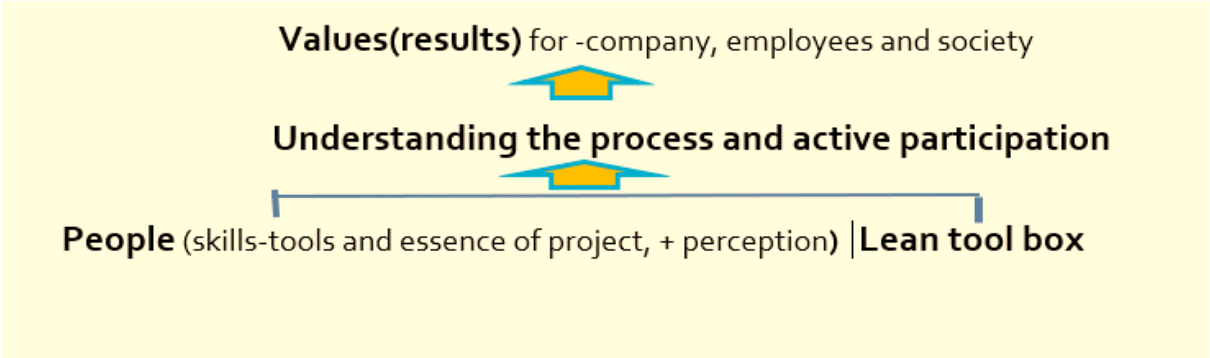

FIGURE 2: MODEL FOR SUCCESS WITH LEAN BASED ON CONTEXTUALIZATION OF LIKERS 4PS. SOURCE: OWNER

2.6 Lean tools and techniques

Many scholars of Lean management have the view that the reason many organizations fail to sustain Lean is because they focus more on the Lean tools which they say usually give needed results but forget to fathom the basic fact of what Lean is about. There seems to be a consensus that Lean is not a means to an end but rather a long -term process which needs a complete cultural transformation in the way things are done. George Roth for example suggest that the Lean transformation should begin from strategy formulation at the top to mindset change of the workers and their immediate leaders to make the improvement activities stick(Roth, 2006, p. 15)

The overriding issue with Lean implementation is to get away with NVA activities with the sole purpose of giving the customer exactly what it demands without delay or defects and by the most cost-effective manner possible. Together with the Kaikaku(mindset) change and the lean principles like value creation for the customer, companies need to support the cultural transformation with practical tools that will help them eliminate waste ang get a lasting Kaizen. Below are few examples of the most commonly used ones but I will concentrate more on the ones that are mostly used in post distribution centres.

Takt time- This is the pace at which products must be produced in relations to quests coming from the customers. For instance, the rate of producing the goods per order from the customer. The goal is to get a continuous flow in the production and get away with un-

necessary delays in executing orders coming from the customers(Støle & Ekeren, 2015, p. 18). It also helps companies to balance capacity with volume needed to be produced.

Here is an example of how it works:

T= Available time to execute any order (produce or give service)

D= Number of units demanded

Takt time(T) = T/D Takt time = Gives indication on frequency of production or time needed to produce one unit.

Value stream mapping- This entails ear-marking some areas for improvements that the lean company deem not to be adding any value to the product or service. It usually starts by setting together an expert team that first maps out the current state and then design an ideal future state that they want the company to be. From the outcome, they suggest on NVA activities that are supposed to be eliminated from the processes.

Fiona suggest that, companies should first have a vision before they embark on mapping out processes and `` the maps should be created in a way to highlight the improvement areas`` (Mwacharo, 2013, p. 16). She further suggests that the mapping process should be an endless process.

Benefits of VSM to a company wanting a complete lean transformation can`t be gain said, however VSM can only help one to map out NVA areas that can be found from customer order to provision of goods or service but does little in removing the non-value adding activities. In other words, VSM should not be confused as complete lean(Hobbs, 2011, p. 9)

5 s - Work place organization- The 5s are drawn from 5 Japanese words which if effected properly can help in planning and organizing work place. Below is an explanation of each of them:

I. **Sort (Seiri) -** This technique entails clearing and sorting out items at the workstations in a manner that unnecessary items are got ridden off. This helps in easy flow of people and materials at work stations. Too much clutter can often

hamper mobility at work stations and can also cause accidents specially if one stumbles upon and this technique helps in this regard.

It is suggested that for workers to see and appreciate improvements that occur because of this technique, it could be good to document workstations status before and after and pin the picture on Lean notice boards (Mwacharo, 2013, p. 10)

II. **Straighten (Seiton)-** Items ought to be arranged in such that those that will be used immediately will placed close to the user while those that needn't be used immediately taken far away. They can for example be arranged chronologically in term of frequency of use. For example, everything that is used daily will be placed close to the worker/s, followed by those that are used weekly and then those that will be needed periodically will be placed furthest etc. Items should also be placed at fixed locations so that it will be easier to locate them when they are need. To achieve all these, tags and labels can be used to arrange items in terms of priority (need)

III. **Shine (Seiso)-** A cleaning routine for workplace is good to ensure the workstation is clean and tidy. Clean environment boosts workers moral, health and help avoid hazards like accidents occurring at work stations. It is suggested that part of the routine should encompass `` finding out any abnormality and root causes`` (Mwacharo, 2013, p. 10). Furthermore, standardizing of the cleaning routines will help in maintaining and sustaining the earlier mentioned 5s techniques(Hobbs, 2011, p. 9)

IV. **Standardize (Seiketsu)-** Responsibilities and work procedures should be standardized so that to create stability and everybody knows what to do on daily basis because the work or procedures are mostly repetitive (remain the same or are done in same order or manner). When setting the standards, it is wise to take into consideration to be affected(workers) opinion. The reason for this is that it simply won`t work if workers feel a second opinion on how things should be done(Mwacharo, 2013, p. 11)

V. **Sustain (Shitsuke)-** After implementing the above four mentioned techniques, the lean organization should strive to ensure that this becomes part of the culture or norms that define their workplaces. The routines and cleaning should become un-endless process, but it will be wise to do some periodic intern routine audit to ensure

the way things are done are compliant with the intended intentions and also check whether there is new advancement in the methods out there and so upgrade own methods.

If well implemented, the benefits of workplace organization(5s) are very many. (Hobbs, 2011, p. 10) lists the following below as part of the possible 5s benefits:

- Better communication and information sharing
- Reduced training cycles for new employees
- More available plant and office space
- Improved productivity
- Improved workers morale
- Improved safety (Reduced accident rate at workstations)

Hobbs is however worried that despite 5s benefits are visible for anyone to easily see and appreciate, he doesn't fathom how better organization of workplaces will improve the overall financial issues that Lean was meant to help mitigate. He says ``5 s by itself has little to do with lead time and working capital reduction``

Kaizen- This is perhaps the most recognized and practiced Lean technique of them all. Kaizen is a Japanese word which the western academics and media translated in their own terms to mean continuous improvements. The improvement work can take the form of gradual small day to day, periodic improvement events or an intensive one time radical facelift. (Hobbs, 2011, p. 11). The goal is usually to bring tangible improvements that can be quantified in monetary terms. Kaizen activities are usually organized into small events called Kaizen events.

Kaizen events somehow resemble VSM with mapping the current state and the idyll future state and so eliminating non-value adding activities from the process. The main difference though is that VSM usually involves top executive strategic teams while Kaizen events are usually carried out by locally organized teams (Kaizen events teams) at the work place with their local leaders as usually the facilitators. The teams are expected to carry out this activities within their work schedule. No extra time for kaizen events(Hobbs, 2011, p. 12). Hobbs says this can sometimes be burdensome for the workers involved. While VSM

can be a standalone technique, Kaizen (kaizen events) is a combination of different techniques for example Gemba walk, VSM, 5S etc. for it to be effective.

Kaizen events are usually one-time process executed by a temporary team assembled together by local leaders especially for that event. They can for example work on a 5s projects that is expected to be concluded within a set time. Once that is achieved, then a new event is usually planned with assembling together a new team to work on it. The process continuous. One kaizen event ends, the another starts.

Success of kaizen events entirely depend on local leaders who are expected to be initiative takers and team facilitators(Hobbs, 2011; Mwacharo, 2013). If well planned and executed, these small one-time processes can be very effective in improving financial returns for lean companies through relentless elimination of activities deemed as non-value adding, improving efficiency and quality of their products and services.

A3 Problem solving- As the name suggests, this is usually a one-page report that usually show how the current tabled possible solutions are arrived at. There is no consensus on the origin of the A3 method, but its popularity came with spread of Toyota`s TPS system. The report can for example start examining the present situation and how idyll future situation could like. It then suggests a possible solution based on the findings and how evaluation and follow up of the mitigation measures should be carried out. This means it streamlines all information needed on how to find the root cause, possible solutions and follow up plans. However, the main focus should not be the technical part which is one page but the A3 way of problem solving process which can help one assigned with the duty to come up with concrete measures to a particular puzzle to present easy to understand and well clear written report that gives a true picture of current situation and the way forward that the third party(decision maker or implementer) can work on(Hoelsæter, 2016)

PDCA Cycle- This is another Lean technique that is very popular among lean organizations. The four letters PDCA stand for Plan-DO-Check and Act respectively. For the technique to be effective , the different components ought to be well integrated and balanced(Mwacharo, 2013, p. 15)

This usually start with similar fashion like the Leans waste solving principles of customer value and pull system where the customers quests and how the things should be done(Value) dictates on when and how the responses at the execution level(upstream) should be done. The first thing is planning on what to do based on how the customer wants it done (customer value). Once this is done, the next thing is executing the plans. At this stage, an evaluation is carried out to check whether what was just implemented is correctly based on the intentions(plans). The results of the evaluation are then acted upon and standards set(Mwacharo, 2013). Having achieved this, the cycle begins once again in a continuous kaizen style manner. The new cycles ought to work in similar functions like the previous ones without any deviations. If any deviated are detected, then the whole process out to be audited until the comes get a standard that works for a long time until new ways of doing things are discovered(Mwacharo, 2013)

Kaizen Board- A kaizen board is a board at workstations where workers attach small cards with questions on things they want answered or improvement ideas that they want to bring to the attention of their colleagues. They are usually attached prior to a scheduled daily, weekly or monthly meeting.

According to Maria Aasbø, a certified lean navigator (Lean coach) and currently a section leader at an organization that is implementing lean says that Kaizen boards make the ideas actionable. She prefers Kaizen boards to traditional brainstorming section meetings where very important ideas usually flow but almost minimum or no follow up takes place. In this she says, Kaizen boards keeps everyone's focus on ``improvement areas and solutions``.

With Kaizen boards, Ideas are discussed, and answers found among the colleges who have similar daily endurances as the one asking. If no answer is forthcoming, then a certain worker or a team is tasked to get to the bottom of the issue and come with a solution(Aasbø, 2016). As such Kaizen boards contributes to high level employee involvement which is believed to be a key success factor in successful lean implementations and also creates a sense of responsibility among the workers who somehow compete to come with interesting solutions or ideas that can make a difference for the benefit of all(Aasbø, 2016)

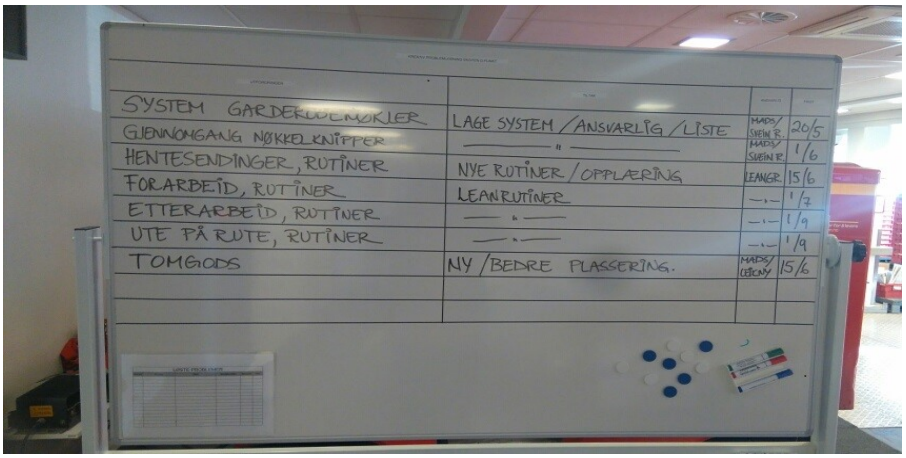

FIGURE 3: ILLUSTRATION: KAIZEN BOARD AT POST DISTRIBUTION CENTRE IN OSLO

The Gemba walk- This means going to ground zero or the epicenter of the action. According to many internet sources, In Japan where it originates, it can be used to describe ``the focal point`` of any action for example crime scene center, military front lines at war zones, earthquake epicenter, production center, selling point etc. In lean, it means leaders going to where real work is taking place interacting with workers and seeing for themselves how the work is going on. The focus of such walks is to actively get engaged in identifying waste areas and opportunities for improvement(Lid & Kristoffersen, 2013, p. 31)

According to many school of thought such ``see it for yourself`` walks are very crucial for they involve everyone at different levels on the ongoing improvement work but it's advisable that such walks shall not be an agenda-enforcing mission but a learning, asking and interaction session that is tailored with the improvement work.

2.7 Norwegian tripartite partnership and Lean

According to International Labour Organization ILO, the tripartite partnership consists of cooperation between employees through their labour union representatives, their employers and the state in matters concerning employment relations and policy setting (ILO, 1996)

The actors usually sign a three-part contract that takes care of everyone's interest. It for example ensures that workers are treated more humanly through creation of a work environment that is conducive, safe and healthy. Other provisions include rights to basic

wage incomes, fair wage structure and equality at work environment that is free of discrimination and biasness based on gender, race, disability etc. For the employers, the three-part negotiations which are the basis for the contract will ensure that trade union demands doesn't kill their basic visions and targets on return on investments through strong competitive advantage over other industrial actors (ILO, 1996)

The Norwegian tripartite model[1] is believed to be the classic text book example of what the three-part cooperation can positively contribute to society`s economic prosperity and harmony as envisaged by the drafters of the three-part cooperation system. There was much talk of Norwegian model in the last few years. The hullabaloo surrounding this special Norwegian model or Nordic model as some prefer to call it got momentum after information about how Norway smoothly sailed through the rough waters of 2009 financial crisis spread to other countries that were really wreathing with the aftershocks of the crisis(Hoelsæter, 2016, p. 5). Despite the raging economic turbulence, Norway was able to maintain its high standard of living standard through its generous welfare system and low employment rate which seemed to be less affected than it did in many other countries (Hoelsæter, 2016). According to Hoelsæther, Norway`s unique work environment cooperation and rights ensure that employers engage workers in everything that directly or indirectly affect their employment situation. This kind of cooperation has for example enabled many employers to carry out many crucial restructuring reforms through planned and cooperative agreement with all the tripartite actors(Hoelsæter, 2016). Norway`s organizational flat structures that empowers leaders at different levels to resolve emerging work-related issues  amicably at the grassroot level for everyone`s benefit as long as it is within acceptable norms and standards have mentioned as one of the reasons that made

[1] Government doubles as a partner and referee in case there is stalemate between trade unions and employer unions during negotiations. This help prevents complete lock out and harm to general economy.

Norway tick where others stumbled(Støle & Ekeren, 2015)

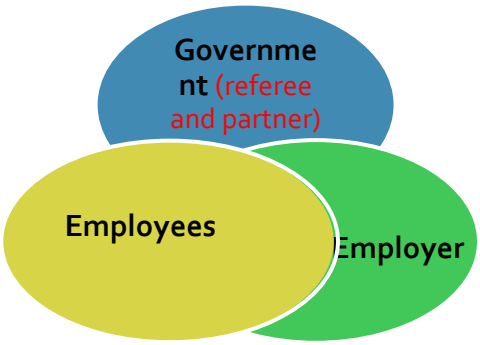

FIGURE 4: EXAMPLE OF NORWEGIAN TRIPARTITE COOPERATION. STATE DOUBLES AS A PARTNER AND A REFEREE IN CASE OTHER TWO PARTNERS DON`T AGREE.

This Norwegian or rather Nordic model resembles the Leans principle of collaborative team effort and engagement at workstations in areas of concern. The workers who double as improvement idea factories and real doers of finally accepted ideas, must be engaged fully for the lean project to work and to stick. The Norwegian organizational flat structure model that is widely practiced enables for this to happen(Støle & Ekeren, 2015)

At best, this type of unconditional cooperation and involvement is said to enhance workers psyche and job attitude positively through the feeling of sense of empowerment and autonomy something that according to lean school study gives the rigorous pursuit for excellence a human face(Støle & Ekeren, 2015)

2.8. Dead on arrival? Common pitfalls new leaners face

Since it is introduction in early 1990s by Womack and Jones, the word lean has become so fashionable that wherever it goes it instantly triggers love at first sort of euphoria among the people but again research also shows that nearly in 98% of the cases it fails to deliver the goods to the hopefuls(Hobbs, 2011). In other words, the hopefuls fail to convert the glittering promises into lasting benefits.

Many researchers have the view that the project fails to turn up to the expectations because either it is not implemented in strict accordance with lean implementation envisaged by the founding fathers (Taiichi Ohno and Toyota), people outside Japan either

don't really understand how lean works or confuse it with other methods or tools like MRP(Elias, 2016; Hobbs, 2011), implement the project without first harmonizing local culture with lean school of thought(Roth, 2006), failure to connect the essence of the project to the company`s overall strategy and visions(Lervåg, 2013), not using the tools appropriately, continue to practice top-down management and failure to involve workers in identifying wastes and finding measures to curb them as lean methodology demanleaving the whole project to be driven by outsiders(consultants) who may have a vested

interest(Lervåg, 2013) etc. Below is a table that summarizes the common mistakes that new

Common Pitfalls	Consequences for lean project
Concept confusion	- Confusing JIT with Lean. Reducing size of own inventory without consulting with suppliers. Pull-system won`t work unless suppliers too reduce the size of their inventory. More bottle necks and cash hold up as a result(Slack, 2013)
Discrepancies between project activities and company`s vision and goals.	- For example, doing a lot of 5s and Kaizen blitz without the result having no effect on investment returns(Hobbs, 2011)
Lack of cultural transformation (Doing lean activities but not becoming lean)	-Same monkeys different forest sort of. Status quo continues, and project is likely to stagnate at the onset. - Using lean as a short-term solution to a certain problem than creating a deeper culture that brings sustainable improvements(Lervåg, 2013)
Not involving the workers	Is viewed as most fatal failure by lean researchers. Practicing top-down management doesn't encourage corporation and team work that lean idyllist prophesize. Project will fail to stick
Over-reliance on external helpers	- Might have a vested interest and ill advice the company by giving false project promises than giving reality orientation(Hobbs, 2011)
Not investing in learning lean-just one-time introduction.	-Poor participation, misunderstanding, project collapse.
Integrating lean project with another ongoing project in the company(Hobbs, 2011)	`` The other project can dilute the lean transformation``(Hobbs, 2011)

Table 1: Showing common errors new lean companies make and their consequences for lean activities

lean companies make in the early phase of the project

2.9. **How to be successful with Lean?**

As pointed out by many researchers, many companies are struggling to sustain lean despite reporting early tangible benefits(Aasbø, 2016; Jaag & Finger, 2017; Mwacharo, 2013; Støle & Ekeren, 2015).As mentioned earlier, a complete lean transformation seems to be a planet away for many for various reasons which we are going to visit soon under the proposed factors that can help make lean a success. The following factors have been widely

recommended by lean scholars and practitioners as a vehicle to complete and successful lean transformation.

Value driven transformation - Before going lean, it is important that the company should be able to define the essence of going lean in the first place and how it can help the company to achieve its targets as enshrined in its missions and visions. Hobbs for example encourage that companies should do a pre-assessment of how much they can save in monetary terms after lean transformation. The calculation of present down value of the savings can for example help the company track and evaluate the performance of the project. He warns the decision for lean should be carefully considered and not merely based on the ``advice and promises of lean consultants ``. He suggests the use of decision triangle when making the case for lean transformation. If the project meets the three-metrics good, fast and cheap-all at the same time or most of it, then it could be a viable project to invest in. He however cautions that the decision triangle shouldn`t be absolute and the final decision should be an average weigh between outcome of the three decision metrics and ``realistic goals for their lean project`` (Hobbs, 2011, p. 16). It is encouraged to develop a scorecard at this level which will form the basis for projects performance evaluation at later stage(Pazzini, 2013)

Concept contextualization- This means `` Adapting, customizing and translating a lean concept to fit in a particular organization`` (Madsen et al., 2017, p 12). They are many methods and lean techniques that companies can choose from. It is vital that companies choose methods and techniques that suit their special needs and give them the required benefits as enshrined in the case for lean. A sharp such on (Found et al., 2009)the internet returns that 5s and Kaizen boards are very popular. But the big question any lean company should keep in mind is what it will benefit to blaze the 5s activities and capture the improvement in the kaizen boards if the results cannot give returns on investments as required. It is therefore advisable that companies should select lean methods and techniques that will help the company ``maximize the benefits, is less risky, affordable and doesn't require a lot of effort``(Hobbs, 2011)

Organization-wide project- Gunnhild Lervåg suggests that the project should cover the whole organization. The reasons for this is that the company might fail the opportunity to

benefit from the projects if it's found to be working for some units that implement it(Lervåg, 2013).

Commitment at the top- The project can`t and won`t be successful if leaders at the top don't see or understand the viability of it for the entire company. They are the ones who have the final say on budget allocation and therefore local leaders don't expect to carry with a project they know won`t get proper funding and support from the top. If workers and their leaders at the grassroot level feel that a lean project will make their company very competitive, it is advisable that they carry lobby activities to sell the project to the leaders at the executive level(Hobbs, 2011, p. 18)

Mindset change- Research shows that less than 3% of lean companies register benefits from lean activities for a sustained period. Many scholars have the view that companies rush to implement lean after they see the first early results but fail to get in place the mindset revolution that is crucial for the project to continue for a long time. George Roth suggest that a mindset change (kaikaku) specially first by leaders and then followed by their subjects is crucial for gaining a sustainable continuous improvements(Kaizen)(Roth, 2006).

The compatibility of the project with the local cultures should be considered before going complete lean. In this, the organization can find ways to teach the old dog new ways through careful and systematically organized manner. Communication of why the project is important for the entire organization, customers and the workers individually should be made a priority in this endeavor. While communicating the benefits of such projects to the foot soldiers(workers), it is important to listen to their suggestions and probably modify the project to make it acceptable by the workers.

Involvement of workers- Small idea crowdsourcing is in fact what differentiates lean from other methods. Fredric Tailors Scientific Taylorism has for instance been criticized for bringing measurable improvements through scientifically tested standard methods that everyone has to follow but failed to win hearts and minds of those who were directly involved (Støle & Ekeren, 2015). In lean, the improvement ideas usually emanate from the workers and then ratified and implemented by their immediate leaders. In this, the company can kill two birds with one stone by benefitting from the creativity and un-tapped

competence of their workers and at the same time increasing the ownership of the project at grassroot level(Støle & Ekeren, 2015, p. 19).

Skills and capability development- For workers to get fully engaged, it is encouraged that they have sufficient knowledge about the concept itself, how the waste elimination system works using the involvement the tools and techniques. Research shows that lack of sufficient knowledge about the essence, tools and techniques is one of the biggest contributor for stagnation or complete death of lean projects in areas where lean should have otherwise worked as benchmarked with related industrial actors (Hobbs, 2011).

Overcoming barriers- (Hobbs, 2011) says when implementing new systems like lean, financial strength and prestige alone should not be the only deciding factor that determines whether to implement or not. He says one needs to consider `` the climate for change in the organization``. For instance, he mentions, the company might have had systems that have worked for many years and the ``company shares might look very good``. This he says, can create reluctance to embrace new ways of doing things. Such reluctance can come from both leadership and regular workers. To break with the status quo, he says, the local lean change agents (leaders and others responsible for transformation) must invest a lot in selling why `` the new way`` is better than old one. In his final remark, he indicates `` Unless everyone in the company embraces lean as the new status quo`` it won`t go anywhere.

Evaluating project performance- To ensure that the project is keeping with the essence, it is prudent to evaluate it often based on the scorecard outlined in the projects strategy map. KPI measures can be carried out to see if the project is giving the pre-determined expected results as captured in the scorecard. This will help the lean organization to keep track on how the lean project is doing. It will help answer the questions like, is it improving financial metrics? How did it affect the workplace climate? Depending on the answers from the evaluation, the company may decide to continue or discontinue with the project or modify it to seal the loopholes that is making it not deliver as expected (Kyle Toppazzini).

Based on the contributions from different school of thoughts on how a successful lean project should be carried out, the researcher developed a conceptual framework to show how a robust idyll Lean system should be implemented.

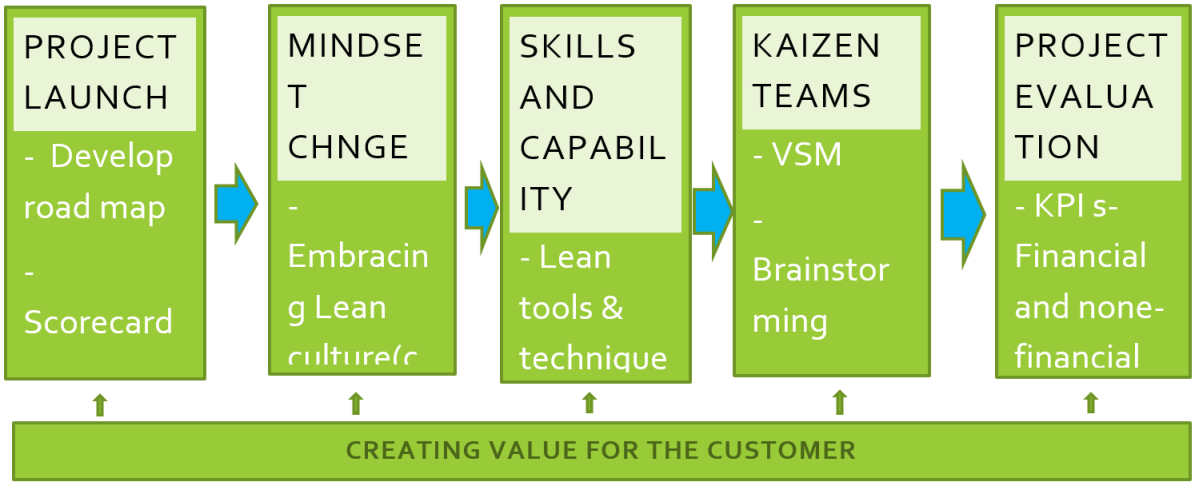

FIGURE 5 CONCEPTUAL FRAMEWORK FOR POSSIBLE CORRECT LEAN IMPLEMENTATION (SOURCE: AUTHORS-BASED ON THEORETICAL APPROACH)

2.10. Lean criticism

The idea which can be traced back to the Japanese car industry Toyota in the post war era period, has been praised to help those that implement it to gain quick tangible results but research shows that many struggle to sustain it to bring a lasting long-term solution. There is a great deal of debate among the research community and in the media about the causes and possible solutions. Many have for instance, pointed out to lack of cultural transformation and focus on results as the reason (Roth, 2006; SVÄRD, 2016; Womack & Jones, 1997) , others view the problem as lean philosophy itself which puts more emphasis on chasing and fixing small problems in the expense of broader company strategies(Støle & Ekeren, 2015). Anderson goes further and gives an example of Lean`s just in time(JIT) principle which he says can only be applied in a situation where the customers need and technology are not expected to change(Andersson et al., 2006). Others attribute it to lack of leadership transforming itself first before selling the idea to their subjects as main stumbling block (Hines et al., 2011; Roth, 2006; SVÄRD, 2016).

Hobbs(2011) points to possible emergence of conflict of interest that may arise because of lean between different department of an enterprise for example the sales and production departments. Traditionally sales departments wanted to maximize the number of sold products because the products were most of the time already in stock but lean enterprise is

based on promises by the sellers to the customer that the product will be available on agreed time and specification. Hobbs says that this can be difficult specially where the customer is not regular, or frequency of the orders are not constant. In such a scenario, he says, the manufacturing department might have problems on meeting the promised lead time because the available material were based on most frequent bought products and the new order if it is different from the rest might take more time(Hobbs, 2011). But he says that lean system requires different departments to work closer together than before so that promises made to customers will be based on realities. As such the customer might accept slightly longer waiting time if his product is quite different from the usual standards(Hobbs, 2011)

Another lean critic is that the philosophy might in fact have an adverse effect on customers loyalty and reduce switching costs in situations where products are homogeneous, and the prices are almost equal. In such scenario customers won`t have time to order for a product if they can get the same product somewhere else much faster and without extra costs or divergence in quality(Hobbs, 2011 p. 445) . Hobbs however reassures that this kind of problem can still be solved within lean system by for example freeing more time so that sellers and others involved can have more quality time with the customer something that will differentiate their products from competitors' products.

2.11. Lean in Postal services- case examples

Case example 1- Canada post

Canada Post has for example introduced lean in their system in 1995 to specially improve the mail sorting system which according to them was consuming a lot time at the time(Marchwinski, 2005). The company trained few improvement teams and engineers to use value stream mapping and takt time calculations to find ways things could be improved. The teams came up with some proposals which were implemented. After the implementation the end result was that mail handling time was reduced by almost four times, productivity by bag has increased by almost 1/3 `` from 19 bags/hour to 25bags/hour``, mail bag travel distance was reduced and more space was freed up because introduction of one piece flow(Marchwinski, 2005). According to Marchwinski, the company`s profitability has increased in the 10 years of lean despite deteriorating mail volumes. In 2005 alone, the company was able to return $59 million to Canadian government in dividends and `` 3.2 million square feet of space freed-up for consolidation, reducing reliance on leases`` in the last decade of lean(Marchwinski, 2005)

Case example 2- USA Post

USA postal service(USPS) has used leans six-sigma together with the total quality management(TQM) to improve it is inefficiency problems that negatively impacted on quality of its services and increased costs as a result something that made them lose a good chunk of the market share(Sixsigma, 2006). To find solutions to the existing problems, the company initiated a company-wide improvement programs and trained personnel to carry out, track and document the improvements. The team came up with standard practices that were spread to the entire organization and formed the base-line for continuing improvement activities. With 4 years of improvement activities, the company could show tangible results that were directly attributed to six-sigma activities. According to a case presentation on sixsigma website, the company has made the following improvements (few examples taken from the case):

- Increased the percentage of first-class mail delivered on time Increased
- Significantly reduced sorting and delivery errors
- Improved customer satisfaction by five points from 86% to 91%

What can be observed from these case examples is that they both heavily invested in personal skill development that were assigned the job of carrying out, fast tracking and documenting improvement. From my subjective understanding, the personnel are not normal frontline workers but constituted internally sourced personal(consultants) highly

trained to help implement and fast track lean management across the company. Lean system is based on ideas from frontline workers that are implemented by management. Since their lean seem to have as expected, it is assumed that the personnel (internal consultants) have in turn trained well front-line workers for it work. Norway Post has similar system with internally trained lean consultants going across the country training front line workers and their leaders on lean techniques and methods for 13 weeks in each workstation and leaving them after implementation to continue with improvement ideas but still offer virtual consulting for all those who need (This will be revisited later in chapter 4). Since many previous studies have over-emphasized how crucial personal skill development is for the success of lean project(Hines et al., 2011; Salem et al., 2016; Sterling & Boxall, 2013 and many others) and taking an assumption based on the above discussions that internally trained lean consultants intern train well front-line workers on lean methods, it is expected frontline-workers have good level of lean awareness. Distribution units in district 2 have similar operations but at the same time each unit has its own local culture that separate one unit from the others.

Based on author`s experience, some of the differences can be having a different leader (with different leadership traits), number of times unit meetings are held, group climate etc. However, lean was only one year old in all the units district two having been implemented in first halve of 2017 and leaders were rotated barely 3moths after lean implementation. Considering the short time, they had with lean plus leadership rotation, it is therefore assumed that the is no differences in terms of lean awareness between the units. Based on the discussions above, the following alternative hypothesis has been developed to examine Norway post employees level of lean awareness and whether leaders educational level matters for awareness outcome.

H1: Norway post employees level of lean awareness is low.

H2. There is a difference in the level of lean awareness between distribution units in district 2

3. METHODOLOGY AND RESEARCH DESIGN

This chapter begins with explanation of philosophical rational behind the choice of methods used in this research. From there I explain the research and strategy, justification for using case study followed by how the participants were recruited, data collected and analysed. towards the end, I review the quality of the data collected and how the ethical aspect of collecting the data was taken care of.

3.1 Business management approach to research

Before the selection of the topic of study and place of study, it was important to bear in mind that the basis of this study was business management and as such two important things were crucial. First was to re-orientating with myself what a business management research looks like and how can the outcome of the research help the manager to find solutions to some existing problems. According to Sekaran and Bougie (2016), a business research especially should be ``designed and executed with the goal of finding answers to issues that of concern to a manager``. According to them, the first thing is to map out which problem areas need to be given focus and the causes studied and from there initiate steps that will help in coming up with solutions that ``can help the manager solve the existing problems or better his business odds by considerably minimizing the problems``(Sekaran & Bougie, 2016). After knowing what the problem is, then start gathering data and then analyse and interpret collected data with the aim of finding possible solutions to problems being studied.

In this research the aim is to find the level of lean awareness and employees perception of lean. The outcome of the study is expected to help leaders see issues that are that are critical to the successful and sustainability of lean for instance employees lean skills and perceptions.

3.2 Philosophy of science approach to research

The aim of research is usually to investigate and understand a certain phenomenon, puzzle, a pattern or a reality as most researchers prefer to call it. They are two approaches in gaining knowledge (epistemology) about reality- positivism and interpretivism

- **Positivism –** this approach tries to understand phenomenon in a wider context. As in behaviours of individuals are usually shaped by the environment in which they live in. Simply put, individuals are not their own-they are part of a bigger body or organism that is society. The way they think, reason and react to certain issues depends on the pre-existing norms in their society. So, positivist will try to understand things in this context by looking at the laws and norms. To make sense of collective behaviour, a positivist will try to gather data from different set of individuals and then objectively interprets the data without being influenced by own values or understanding of things(Jacobsen, 2015 p. 25).

Most positivist seem to incline towards quantitative method of data gathering. The reason is according to Jacobsen (2015), most quantitative data are in form of numbers which if done correctly can give a more precise understanding of the phenomenon being studied. In addition, he says, quantitative methods can make it possible to handle a huge data that can be easily be analysed with help of statistical methods. Because of the this, the reliability of the data to be generalized into a wider population becomes more polite(Jacobsen, 2015)

Jacobsen(2015 , p 25) says that quantitative researchers first need to develop mental expectation on how the reality looks like and from there go ahead and collect data that can either affirm or dismiss our earlier view on how the reality looks like. The expectations should first and foremost be based on previous research and theories. This is called deductive approach. The flip side with approach is that ``the researcher may fail to take with information that is relevant to the research and take with only information the researcher believes is relevant``(Buerstad & Didriksen, 2014, p 28)

- **Interpretivism-** this approach tries to understand phenomenon through the lenses of the doer- the individual. This approach is based on social action theory that expects the researcher to understand things from individuals own perspective before interpreting the data. It encourages humanistic approach on the part of the researcher in his endeavour to understand and interpret the reality of the individual to first develop empathy by putting himself in the individuals shoes to get an in-depth understanding of why an individual does or reacts to things in a certain pattern(Jacobsen, 2015 p. 28). Since this approach calls for subject understanding and interpretation of the reality, it is more harmonious with qualitative method of data gathering.

  Interpretivism approach is also closely linked to inductive approach. Inductive approach is the direct opposite of the deductive approach. Here the researcher goes with an open mind when collecting empirical evidence and generates a new theory from the empirical evidence gathered. The good side with this approach according to Buerstad and Didirksen is that `` the risk of losing information becomes minimal``. But critical realist philosophers have criticised this approach by saying `` there is always some knowledge or information that is beyond human comprehension which cannot be attained through observation or being close to reality``(Miller & Tsang, 2011). Another critic of inductive approach is that ``it is naïve to approach the reality with a blank mind``(Buerstad & Didriksen, 2014).

  - **Pragmatism –** According to Jacobsen(2015, p 34), this approaches believes that both positivist-deductive and interpretivist-inductive approaches have both strengths and weaknesses and that it is only drawing the best from each that we can attain a good knowledge about reality. A pragmatist might for example have a view on the reality looks like and so tests the reality(positivism/deductive) but might in the process find new theories that may explain the reality(interpretivism/induction) and vice versa. He may therefore mix the both the methods to gain knowledge about the reality. This approach is abduction.

A point of interest in this study is to understand the collective issues that concerns the employees something that impacts their collective level of participation in improvement

activities. As such positivism approach is in order in this regard but we are also interested in understanding the subject opinions of their leaders to explain the underlying issues that affect participation. So, a mixture of both the approaches (abduction) is employed here to get knowledge and interpret the data.

3.3 Research design

``The research design is supposed to illuminate common aspects between the collected data and the question of research``(Støle & Ekeren, 2015)

In that case, the type of questions asked in the problem statement and the general objective of the research dictates which method to use. In this research, the general objective is to contribute to the knowledge of ways employees' participation in improvement activities can be increased. As such, the objective influenced the research question which also influenced the method used to gather the data. The designs usually show the whole process- from formulating the problem statement, gathering of data and practical implications to final interpretation of the outcome.

3.3.1 Choosing research design

There are many types of research designs but considering the nature of this study and the overall objective of this study, two types of research design were considered.

- **Descriptive-** This method is usually used when the goal is to get a deeper insight on certain issues by gathering data that can help explain why a certain phenomenon is the way it is(Jacobsen, 2015, p 14) This method is usually time bound as in the interpretation of the data gathered is limited to a certain time frame when the phenomenon is studied(Buerstad & Didriksen, 2014 p. 27) . How this gives the researcher a chance to track and research on the same populations for a period. The results derived from such tracking of changes of patterns and attitudes of

responders, can give the research a more reliable result that can give a conclusive explanation on a certain phenomenon.

- **Explanatory-** This method is appropriate when the researcher has an interest into getting the bottom of why a certain phenomenon occurred in the first place. The objective is usually the relation between the outcome(effect) and the cause(Jacobsen, 2015, p 14). It can also be used when one is interested in knowing why two different phenomenon look alike or different and the causes for this observations(Buerstad & Didriksen, 2014, p 27). Development of hypothesis to confirm or reject the cause and the effect approach to understand the correlation between two related or un-related variables has been suggested (Buerstad & Didriksen, 2014)

In this thesis, the descriptive method is used since the study is about the level of lean awareness and perception of a certain population in a specific period. The reason is that the employees' perceptions particularly is expected not to be static but rather dynamic with changes of circumstances that makes either positive or negative.

3.4 Research strategy-A mixed method

``all roads lead to Rome``

Research strategy is how to go about while trying to declassify knowledge about a certain reality. Simply put, it is a systematic plan of action aimed at gathering data about a certain puzzle that you aim to declassify and then generalize the outcome to mean a wider population(Jacobsen, 2015, p 25)

To get the desired results, one can either stick to a method or combine several methods to get the end results. You can for example use either quantitative or qualitative method or a combination of the two. There seem to a general understanding that quantitative method is suitable in certain circumstances for example where you want to study a huge population or entities where objectivity and positivism line of thinking is crucial while the qualitative

approach can be used when studying one or few entities and are such subjective interpretation of the reality is crucial.

Both the methods seem to have advantages and weaknesses. It has for example been pointed out that quantitative results can easily with help of statistical methods be used to generalize to wider populations that didn't take part of the study. The reason for this the huge number that are usually involved in this study which makes the variance much smaller. Critics of this method argue that respondents are often given close-end questions without possibility of giving their deeper feelings about certain issues. I addition, when a researcher makes survey questions based on his/her understanding of reality and so there can happen a discrepancy in the study if the respondent doesn't share the same view on reality as the researcher(Jacobsen, 2015, p 127). Qualitative method is first and foremost about word of mouth- said by the respondent or between researcher and the participant. As such, this method gives the participant a chance to expound more on issues to avoid being translated word for word when the intended meaning seen in a wider context diverges from what is said. One disadvantage critics point about this method is that the information you get can sometimes be superfluous and contradict each other something that can make it harder to interpret(Jacobsen, 2015)

Researchers seems to be divided on which method is best to use. Jacobsen (2015) argues that, the bond of contention between enthusiast of both sides is that `` qualitative conveys a meaning about a certain reality while quantitative shows scope(numbers/extent) of the reality. Period``. He says that a number is more than just a number. Differently put a number can have a deeper meaning and therefore partially rejects this notion. Jacobsen gives an example from the ongoing municipal merger debate in Norway and says that 5 people rejecting the merger carries a deeper weight compared with the natural number 5 because the first one shows this people are satisfied with the status quo while the last one doesn't carry any meaning.

Jacobsen argues that which method is best suitable is mostly dictated by how much you know about the phenomenon in advance. If you know so little about the phenomenon, then it is best to use qualitative method because it gives you a chance to change your research questions while you dig dipper into the issue being studied. On the opposite end, if you have

a previous information about the topic of study and the problem statement is quite clear, then it is advisable to use the quantitative method(Jacobsen, 2015). In addition, Jacobsen says, if you want to renew you understanding of the phenomenon and are interested in bridging the link between the what the individual says and the wider context, then it is advisable to go for qualitative method. On the other hand, if you are interested on the frequency of phenomenon taking place or what is the stand of majority or minority of a given population on a certain issue, then it is more practical to go for quantitative method.(Jacobsen, 2015)

``If a researcher is well acquainted with the both methods and views them in similar lens-as in whichever way chosen can help shade light on the problem statement-then he/she should use the one that can best help to answer the research questions`` (Jacobsen, 2015).In academia, this approach is called pragmatic approach.

Considering the strengths and weaknesses of both the methods and later the pragmatic approach, can this open-up the possibility of combining both the methods to get the best of the two methods and minimize their weakest points. In addition, the methods can audit each other- as in the consistency of results obtained through either of the methods are not expected to diverge that much something that will increase the validity of the results. This is called method triangulation. A case in point is for instance a situation where the researcher doesn't possess enough prior knowledge about the topic or phenomenon being study but still wants to combine results from different individuals and quantify them to a wider population, then it is best to use a mixed method approach. The reason for this is that he can first acquire knowledge and develop assumptions about reality using qualitative method and then come back and make his own survey questions and later carry out quantitative research in the convectional way. Below is an illustration of how this can be done.

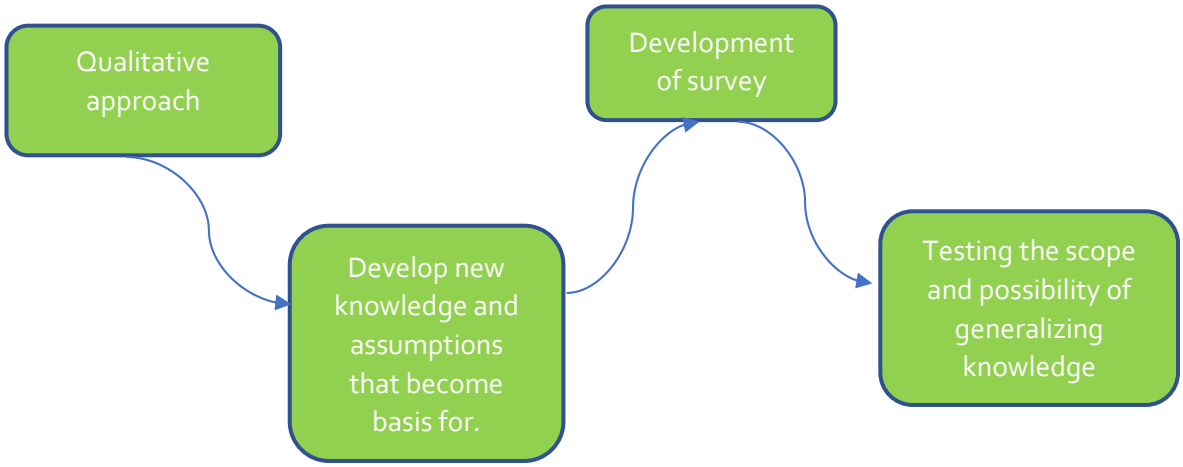

FIGURE 6 TRIANGULATION METHOD- QUALITATIVE APPROACH BEFORE QUANTITATIVE APPROACH. SOURCE: JOHANSEN(2015, P 138)

In this research, part of the sub-questions in the problem statement were questions dealing about how much employees know about the lean tools. Since they were several post distribution centres taking part in the study and the author didn't know which lean tools to include in the survey, then it was logical to first do the interview with their respective leaders(qualitative) and so include only the tools were discussed when they programme was being rolled out and later by their own leaders. In addition this augurs well with my critical realist approach which believes that in trying to understand a phenomenon, it is not just about universal laws which can help us understand why individuals in a certain society react to a certain stimuli in a certain way (positivism) or interpreting things from the subjective understanding of the individuals(Interpretivism) but that they can be deeper underlying issues that can make it hard to understand a phenomenon by merely observing it or interpreting the outcome of particular studies and the impact of the phenomenon can be something beyond our imagination.

3.5 Pre-investigation

I was first introduced to lean during a strategy course in January 2017. Surprisingly 4 months later in May 2017, the lean mini-transformation which was ongoing in Norway post since 2008 finally reached our unit. After the project introduction meeting was over, there was no doubt in my mind that I was going to write about lean in my final thesis. In addition, my economic management major made it even more relevant as for the choice of the topic.

First forward autumn 2017, when were to select what we were to write about and where to write about, then it was easier for me since that I already wanted to write about lean in my own organization. The only issue at the time was how I was going to approach this considering the limited time available to carry out data collection and complete the whole assignment. Considering the logistics and the overall circumstances, I decided to limit the study to be only on the mail division of the post. The mail division has over 100 units spread all over the country and it seemed that it will be over be over-ambitious from the researchers to successfully carry out such a large-scale data gathering considering issues just raised in this paragraph. Ultimately, after discussion with my research supervisor, we found that if at least 100 participants/respondents can be found then that will be acceptable. From there, I discussed with my unit leader about the minimum number need and we discovered that this could be done in Oslo alone.

3.6 CASE STUDY

Traditionally case studies were understood to be a study on a specific unit or organisation that researcher was specifically interested on researching on them (Løkken et al., 2015). Recently, this view has somewhat changed as depicted by what Jacobsen says about the common denominator that defines what a case study is `` an ongoing study on one or few units under research``

According to Jacobsen, considering the boundaries set by the limits of space and room, we can divide the unit into different levels with lowest level being individuals and the highest level being a group of individuals , organisation etc(Jacobsen, 2015). He clarifies that an organisation can encompass a group of individuals at the same level or different level or many units with same differentials as that of the individuals.

What is good about case studies especially singles case studies are according to Jacobsen, possibility of getting a good in-depth understanding of reality because of the limits of space and time. The biggest drawback associated with especially single case studies seems to be difficulties with generalizing the outcome(Løkken et al., 2015)

In this research, the mail division of the post is the specific object of study. Further, only a few units within the mail division were selected to be part of the study. This can make it difficult to generalise the results from these few units to represent many of the units that don't participate in this study. On other hand, despite having similar operations, the selected units are not the same in absolutely everything considering comparable parameters like leadership, local working climate, learning at work place etc. Based on this discussion, differences between the units in terms of lean awareness and perceptions are expected.

3.7 Collection of the data

Under this sub-section, I am going to highlight how the data was collected. Both primary data and secondary were collected. Interview with unit leaders and survey questionnaire by employees formed the primary data. Analysis of intern documents provided, and literature review formed the secondary data. My own experience as post worker in the mail distribution and first- hand information on ongoing lean activities also formed part of the empirical evidence for this study.

3.7.1 Selection of the participants

When selecting participants for research studies certain criteria must be met. For instance, there should be a random selection of the participants to avoid getting skewed results that can`t be generalized. Jacobsen (2015) gives an example of a case where a researcher chooses few people from a certain list and bases his conclusions on the outcome from few selected to participate. If the % number of male respondents to that female respondents are in the ratio of 80:20, then the female results will be too small to give a correct picture of what women in that whole list mean about the issue of study. To avoid this biasness, Jacobsen encourages random selection of respondents from the whole population or organisations members list. If a researcher is first and foremost interested on getting a higher calibre information, then he can non-randomly select specific persons that he/believes possess or have enough knowledge about the phenomenon for instance leaders, teachers, field experts etc.

Another criterion is to avoid the `` the typical or the extreme trap``. When selecting units or informants for interviews, it is vital to balance those that have positive opinions about a certain issue and those don't. Jacobsen emphasizes the importance of mixing these two ends to avoid getting skewed results just like in the case of non-random selection.

In this research, the are 8 mail distribution units in Oslo and 5 were randomly selected to participate in the research. All the units belong to the same district (district 2) under one leadership. The only criterion was that lean was implemented in the participating unit. Further, all permanent employees in the unit were given the chance to participate in the study something helped rule out concurrently both the non-random selection and the typical/extreme trap that can cause skewness of the results. When it concerns the hunt for specific information and selection with of the correct informants with right knowledge, we will take that under the next headline

3.7.2 Interview of key resource persons

This is an interview with key informants. In other words, talking to people who have dipper knowledge about the issue being studied. Their inclusion is vital especially if one is interested in having a comprehensive specialized knowledge about the phenomenon being studied. Their perspectives and takes on the subject matter are said to be quite informed and based on what they already know rather than mere speculation(Pleva, 2016, p 41).

In this research, key resource persons were 4 first line leaders at 5[2] different mail distribution centres located in Oslo region, district manager and one lean navigator-a lean consultant who took part in the lean implementation process in these centres. Information I got from these persons was very vital for the study especially in the formation of the questionnaire. Part of the research was to test employees' knowledge about the lean tools and techniques used in their workstation and it was only a prior qualitative key informant interview that I could include only tools and techniques that were applied in their work places. This helped fill information gaps in the survey and narrow down the number of lean tools tested to include only those used at mail distribution centres. In addition, they

[2] One of the distribution leaders was responsible for two distribution centres.

possessed a better information about the how the project was doing- whether it was working and documented benefits etc.

Only 3 of the 5 distribution centres were interviewed. This reason for this is that one of the leaders was responsible for two centres and another was recently transferred from his distribution centre and had the capacity to answer questions about both places because according to him and other information I got from other sources, he implemented lean in his previous workstation and did a lot of lean activities in the current workplace. Furthermore, I couldn't get in contact with the previous leader of this current leaders work place. The current leader of the previous workstation of the leader who took questions for two places was not interviewed but I had a 15-minute discussion with him that included a tour at the workstation. Because of lean navigator`s commitments elsewhere in the country, face-face interview with him was not possible. Instead we had an impromptu 10 minutes telephone discussion.

Although it is not a pre-requisite, it is encouraged to carry out interviews in the interviewees ``natural environment``. The setting plays a crucial role because according to Jacobsen(2015), research has shown that `` the context- where and how the interview was done often influences the quality of the answers``. In this study, all the three interviews took place in the office of the leaders. A semi-structured interview guide was prepared in advance with open-end questions. Researcher has though tried to ensure that all the questions were answered albeit not being chronologically answered. An information letter covering on issues of consent, freedom of participation, purpose of the research etc together with an interview guide were sent via electronic mail or delivered by hand by the author to the informants at least two weeks prior to the interviews to give them amble time to prepare. From there, a time-schedule for the interviews were set in close-collaboration with the participating leaders.

Two of the interviews took 40 minutes each as scheduled while one took 1-hour because of unavoidable disruptions in the part of the informant. The original plan was a 40-minutte interview for each. Need to point out that time is of the essence in mail distribution centres. The job is hectic and complex. The leaders' offices somewhat operate almost like emergency call centres with their telephones ringing nearly non-stop mostly from workers

who met some unforeseen challenges out in their routes and need immediate help and from the customer -care service desk informing leaders about customer complaints that need to be noted and followed up immediately etc.

A consent to audio-record the interviews were requested- and none of the informants objected to this. In addition, notes were taken during the interviews. One of the informants also gave me intern documents (see appendix) showing how they do ``their lean`` and how the Gemba-walk is done. Lean navigator sent me via mail a documented case of how 5s has systematically improved the mess- and disorganization in a mail distribution centre he has particularly helped implement lean.

3.7.3 Questionnaire survey

``When developing a questionnaire, it is a pre-requisite that the chosen variables can be converted into numbers``(Jacobsen, 2015)

Questionnaires are practical when is interested in the in the collective individual responses than in-depth analysis. Said differently, questionnaire should be used when the context of how or where things were said is not vital and when you want quantitative data that captures the average opinion about what a certain majority or minority thinks about a certain issue but if context is considered vital then qualitative approach where the word of mouth is used as a means should be used(Jacobsen, 2015). In this research, opinions of the larger work force were vital, so a questionnaire was designed for that purpose while an informed knowledge from the key resource persons was captured through a qualitative interview.

When pre-structuring the questionnaire, special attention should be given to how the sentences are formed. They should be formed in such a way that the answers given can easily be converted to numbers which when added together form a big data (Jacobsen, 2015). In this, according to Jacobsen, the researcher will be able to filter out irrelevant information and the same time help narrow down the gap between researchers understanding of reality and that of the respondents. Other researchers have a similar view. Støle and Ekeren (2015) say that `` This helps avoid unwanted results``. In this thesis, questions with close-ends were formed in such that respondents could only either agree, somewhat agree or disagree on questions asked. The problem of reality understanding-distance between researcher and respondents are considered minimal in this research because the researcher himself is also part of the respondents since they work for the same organization and have a similar experience albeit differences in personal opinions especially in matters lean.

Questionnaires can either be designed from scratch or an already ready-made template can be used that has similar survey construct as the research for instance one can use an already made template on workers experiences since this is very common(Støle & Ekeren, 2015). In this research the aim was to capture employees level of lean understanding and their perceptions about the continuous improvement program. The formation of the questions was based on theories covering employee workplace learning, employee perceptions in lean companies etc. Areas of workplace learning, and perception were widely researched before but the author couldn't find templates that test employees level of knowledge about lean tools. As such a questionnaire was formed from the scratch.

Questionnaires can also be online, or paper based. Both the methods have their own pros and cons. Paper format are for example is said to have better response rate than online based survey(Støle & Ekeren, 2015, p 10). In addition, they give better anonymity guarantee than the online option. Based on authors experience, delivering post is very hectic. No extra time is usually given to take part in this kind of surveys. Workers are also expected to finish their job within accepted work hours and vacate the locations to avoid extra time allowance payments. Lean perceptions also capture feelings about work place and mode of leadership and therefore anonymity of the respondents was considered important in this regard. Based on this, survey paper format was used in this research.

The questionnaire had 2 sections. First there was introductory part, employees profiles and demography (where they work). The first section was about employees lean awareness. This section was further sub-divided into 5 sub-sections with first sub-section testing awareness about the essence of lean project, the second sub-section was about recognition of lean tools and techniques, the third sub-section which is related to 2nd sub-section was testing employees lean tool preference (which one they thought was most effective). The 4th and 5th sub-sections were about recognition of contextualized lean wastes and the benefits respectively. The second section was about employees' perception on lean.

3.7.4 Pre-testing and information letter

Pre-testing functions like rehearsals before major events with the aim of avoiding mistakes that jeopardize the quality of the performance. In research, pre-testing is praised to help avoid misunderstanding of the questions regarding word formulation, context, feel, ambiguity etc (Lid & Kristoffersen, 2013, p 46). It also helps guard against reality understanding gap between the researcher and the participants. In this research, the complete questionnaire was given to some first -line leaders and few workers to test how they react to the contents in terms of relevance, consistency, grammar and feel. Few alterations were made based on the responses from the pilot group.

An information letter touching on the purpose of the research, freedom to participate, anonymity, how long it will take to complete the survey and how the data will be analysed etc were put on the front page of the survey paper.

In the information letter, special focus was given on matters confidentiality and privacy protection because research shows that this kind of guarantees are known to have a positive influence on the participation(Lid & Kristoffersen, 2013).

From there, questionnaires were delivered to participants via their first-line leaders who helped distribute the papers and letter collect the responses. After consultation with each workstation first-line leader, a period of three to four weeks was given to complete the survey. This was the case because the different units have differences in routines when concerning information meetings something that is crucial for the distribution of the surveys because leaders usually inform about new things, things that are to be done etc. through common floor meetings. Questionnaire used in this survey can be found in the appendix

3.7.5 Literature review

Reviewing established theories and empirical evidence from previous research formed part of the secondary data for this research. Scholarly written articles, books and previous research that touch on areas lean, employee participation, workplace learning was carefully reviewed and used as part of the foundation for this research. Google scholar found in NMBU`s database was majorly used with key search words as lean, lean tools, workplace learning, employee participation, lean in postal services etc. Most of the books were borrowed from the university`s various libraries in main campus (In Ås municipality). Previous written academic papers like master thesis were used if they were found to be relevant for the study. A criterion for choosing literature sources for this study was they were relevant for the study, can help answer the research questions and a guide on what to include in the research questions. They are controversies concerning authenticity of especially internet sources and some of the theories or information are criticised for being too general or too ambiguous(Nilsson et al., 2012, p. 16)

3.7.6 Researchers own experience

The researcher is an employee of the organization being researched and has for nearly a decade worked as postman in one of the participating mail distribution units. Authors own experience as ``a native`` or an insider forms part of the empirical evidence for this

research. There is a great deal of debate surrounding the legitimacy of doing research in one's own organization. I will revisit that under the quality of the data and ethical considerations.

Doubling as a researcher and a member of the participating informants has had more good than harm for this research. I had an easy access to `` people that matter`` right from the onset. For instance, I didn't have to send formal letters asking the organization whether I could research on them. Judging from the first reception from the key persons informed first-this was almost like obvious. My unit leader and employee representative indeed played a crucial role in decimating information to other leaders about the impending research on the lean continuous programme. The ball was in my court in this regard on how I was going to design and execute the research considering the hectic schedule at the distribution centres.

The researcher has first-hand information that was accumulated in line of duty that may had a crucial impact on the research. Researcher has for example seen the organization metamorphose many times for example seen employee layoffs, value maximization (increasing revenues and slashing down costs), improvement programs like the ongoing lean project and employees feel about the various transformations including lean that the organization has carried out in the recent times. This wealth of knowledge has for example helped researcher to fine-tune the research questions in a way that is close to participants view on reality since he shares a common start point and shared destiny with them despite the intra-collegial individual differences in perspectives on various issues.

Researcher had also full access to nearly all the participating units and could inspect without any reservation or suspicion some of the outcome of the ongoing lean projects in the units. Un-reserved full access to almost everything might have been an uphill task for an outsider. This helped the researcher to cross-compare the units and verify some of the results of the quantitative and qualitative survey with what was observed in the units.

3.8. Analysis of the data

3.8.1 Data processing

``Processing and analysis of data collected can be performed in different ways with different purposes. Examples of objectives are to compare, find relationships, show changes or illustrate positively and negatively between different variables and suggestions for solutions``(Nilsson et al., 2012, p 24)

The raw data gathered was coded and put in excel spreadsheet and then loaded to R commander and Minitab for further analysis. Descriptive analysis was mostly used to understand the data better and conclusions made based on results from descriptive analysis and hypothesis testing. The qualitative data, recorded data from the interviews were transcribed and sorted out through axial coding- arranging data into various categories by matching things that were said on each problem with corresponding chapter or theory etc.

3.8.2 Measurement system

Lean awareness

In the questionnaire there were initially 48 items that were testing lean awareness but this were reduced to 44 because while testing physically testing physically the normality of the survey returns while processing the data, I have found that lean awareness sub-section that tested on employees preference of lean tools and techniques (sub-section 3) had nearly everyone skipping to answer or setting it in a question mark on the whole sub-section. For instance, in distribution unit 3 which had 10 respondents had only answering. Even the few who attempted it from other units, left many items in this sub-section not being answered. During the pretesting, the leaders answered all the questions in the survey including this part. It is easy to guess that if someone doesn't know the tools, they can`t prefer anything but can't conclude on this view since no follow up interview to get respondents view of why they decided not to answer this part was done.

On the remaining 57 items, one item tested on purpose of the project, 12 on lean tools and techniques, 15 on recognition of wastes and 17 on recognition of benefits of lean. But in the survey, there was no question on lean awareness, therefore to analyse lean awareness a global variable was created that covered all these items. Creation of global variable or a general variable that helps drive meaning from independent variables that are meant to answer a general problem is a scientifically accepted method as discussed in a forum in research gate available at https://www.researchgate.net/post/How_do_I_combine_8_different_items_into_one_variable_so_that_we_will_have_6_variables_using_SPSS. The essence question had 5 multiple choices of which three could be correct when we think of awareness. Each correct answer gave a full score of 1 while non-correct answers gave zero score. A new. With this, a general global variable that tastes lean awareness was derived from the four global variables. This type of scoring system has previously been used in another related research on lean awareness(Salem et al., 2016, p. 7). To measure the level (degree) of lean awareness , the scale system used by (Salem et al., 2016) will be used. In his survey, Salem used a Likert scale of 1 to 5 with 3 being neutral(midpoint). Therefore, he used which side of the mid-point the results lie to determine the level of awareness. He accepted anything above mid-point as indication of satisfactory level of awareness. Further on in the analysis, he used anything above 50% average mark as an indication of acceptable level of awareness. This study will use percentages derived from average scores with anything above 50% being accepted as satisfactory level of awareness as shown in table 6 below. Below is an illustration of how the global variable is created and how the level of lean awareness is measured

Global variable creation

1. First, for each category a new variable is created based on the average of scores for each observation as illustrated below.

   Explaining the scores

   - **Essence-** Saying YES gives full score (100%=1). Not answering gives zero score= 0

- **Tools-** Yes or No questions- Yes gives full score (100%=**1**) NO gives zero score
- **Wastes/Effects**- Scale of 1 to 5(Disagree to Agree)- 1=0 score; 2= 25%**(=0.25)**; 3=50%(=**0.5**); 4= 0.75% (= **0.75**); 5=100%(= **1**)

NB: For 1-5 scale – the same pattern of percentages is used in **R** (Descriptive summaries)

Table 2: Illustration-awareness scores for essence of the project				
Category-Essence of the project		V1- Economy	V2- Quality	Awareness-1
Observations	1	1	0	**0.5** = (1+0)/2
	2	1	1	**1** = (1+1)/2
	3	0	0	**0**= (0+0)/2

Table 3: awareness scores for tools & techniques				
CATEGORY TOOLS		VARIABLE 1	VARIABLE 2	AWARENESS-2
OBSERVATIONS	1	1 (**YES**)	0 (**NO**)	**0.5** = (1+0)/2
	2	1	1	**1** = (1+1)/2
	3	0	0	**0**= (0+0)/2

Table 4: Illustration -How awareness scores for wastes and effects are derived				
CATEGORY WASTES/EFFECTS (SAME WAY)		VARIABLE 1	VARIABLE 2	AWARENESS-3
OBSERVATIONS	1	0.75- partly agree	1- Agree	**0.9** ≈ (1.75/2
	2	0.5- Neutral	0,25-partly disagree	**0.4**≈ (0.5+0.75)/2
	3	0.5- Neutral	0.5- neutral	**0.5**≈ (0.5+0.5)/2

2- Finally, a global variable measuring the level of lean awareness is created from summing awareness scores from all the categories and then dividing by the number of categories/awareness-parts. Below is an illustration of how this is done.

Table 5: Illustration of how the global variable is arrived at					
		Awareness 1	**Awareness 2**	**Awareness 3**	**Level of awareness (Global variable)**
OBSERVATIONS	1	0.5	0.5	0.9	**0.6**≈(0.5+.5+0.9)/3
	2	1	1	0.4	0.8= (1+1+0.4)/3
	3	0	0	0.5	0.2≈ (0+0+0.5)/3

Table 6: SHOWING HOW LEVEL OF LEAN AWARENESS IS MEASURED	
Grades in %	**Meaning**
50 to 100	Acceptable level of awareness
0 to 49	Low level of awareness

3.9 Quality of the data

Any research must pass the quality test for to it be credible. Credible in the sense that the result must not be ambiguous (conforms with the purpose of the research), can be generalised into wider populations and be trusted(Jacobsen, 2015, p 229-230). Jacobsen mentions but not limited to two main criteria's in which a research`s quality can be assessed namely reliability and validity of the results. He further sub-divides validity into intern and extern validity. We will expound more on this in subsequent sub-headlines.

3.9.1 Reliability

Dudovskiy (2018) defines reliability as `` the extent to which the same answers can be obtained using the same instruments more than one time`` . In other words, how consistent is the results

if it was repeated several times. Do we get the same results always if the same method was used again and again by the same researcher or by other researchers? The more consistent results are the more trustworthy is the research(Jacobsen, 2015).

The reliability issue first arises because in any research there is usually concerns on whether how the research was approached, empirical evidence collected and analysed can indeed have influenced the type of results one gets(Jacobsen, 2015). Questions have for example been raised on the influence the researcher has on the results especially in situations where a single researcher has solely carried out the research. This is concern because according to Dudovskiy, the whole process and the outcome might have been influenced by the researchers subjective view on the reality(Dudovskiy, 2018). Jacobsen agrees with this view and says that when collecting data, the researcher may focus more and collect only data that reflects his subjective view on reality.

On whether the data collection was planned or impromptu has also been mentioned to have a great impact on whether the respondents are saying the truth or not. Jacobsen says the impromptu method usually gives more reliable results than the planned one but there is ethical consideration to be made and more so, there is a laid down regulation that makes this approach nearly impossible.

How the results are handled also influences the reliability of the results. Jacobsen(2015, p 245-246) mentions two ways in which this can happen. First, considering humans tendency to make errors, the possibility of results mix-ups, wrongfully computing the results or simply not remembering everything said in the case of interviews where audio-recording or proper note-taking wasn't done increases dramatically. Secondly, inaccuracy in results analysis may occur if for example there is a fundamental mistake in the way the results were categorised. Utmost attention must be observed when matching units with their natural categories(Jacobsen, 2015)

Reliability assessment in this research

Due to time constraints, the researcher couldn't carry out subsequent researches on the same subject matter and setting and therefore this might influence negatively the reliability of this research. However, the results were compared to results from previous research on

the same subject but different setting. This is evaluated of reducing the negative impact of failure to do repeat surveys may have on the reliability of the whole research per see.

The questions used in the survey and the interviews were made prior to the actual gathering of the data. The questions were made based on researchers subjective understanding of the reality and earlier developed theories on the subject matter. This can also weaken the reliability of the research since there could be a reality understanding distance between the researcher and the respondents. However, the researcher is also a participants(insider) something that may help reduce this problem but not fail proof considering the critical realist theory

All interviewees had a prior knowledge of the interview question at least two weeks before the actual interview. This also assessed to weaken the reliability of this research since the informants had amble time to prepare and subvert the truth if they so wished. Considering the ethical aspects mentioned in the previous sub-heading and desire to make the data collection successful something that required close collaboration with the informants, there was nothing more the researcher could do to minimise this problem. All interviews were however properly recorded, and a great care was taken in transcribing and categorizing the answers in their correct natural categories. The same also applies to the quantitative survey method and the final analysis of the results. This is assessed to have a positive effect on the reliability of the results.

3.9.2 Validity

``When the deal is too good think twice``

The researcher must always wear a critical lens to ensure the results he gets serves the purpose(Jacobsen, 2015 , p 228). Put differently, the results from the research must correspond with prior set object i.e. did we get what we wanted to get? Does the result answer the research questions? This is called validity. Validity can further be categorised into internal and external validity:

Internal validity is the degree or possibility of making correct conclusions based on the results at hand or the extent to which the conclusions are perceived to be a correct

reflection of reality. This mode of testing the quality of the data is called data validation. Jacobsen raises three critical questions that must be asked chronologically to test the intern validity of results namely:

- Whether the respondents' answers give a correct picture of reality
- Whether researcher's depiction and translation of the data is correct
- Whether the conclusions indeed are a true reflection of results

Jacobsen refers to earlier studies which criticises ``the naive approach`` researchers take when collecting especially qualitative data. He says that there is tendency for researchers to naively believe the informants version of reality without reflecting on the authenticity of the data collected. Further, the researcher needs to evaluate on whether the informants are in fact the right source and if they do, whether they have the capacity to give correct information (Enough knowledge about the reality)? How close are they to the reality to give a true information on reality (First-hand information)? Whether the sources have personal motives to subvert the truths in their own favour(Transparency)? Can the context in the way the data was collected make it hard for the respondent to give an unbiased version of reality (For example if there were there others around that possibly affected the type of responses from the respondent)?

To validate the authenticity of the respondent's version of reality, Jacobsen proposes three strategies that can help minimise this kind of problem.

1. Try to confront the respondents with his earlier version of reality to check for discrepancies of the two data. For example, confronting an interviewee(qualitative) with his earlier responses in the same subject (for instance questionnaire survey answers). This mode of validation is called method triangulation.
2. Present the deductions made based on the collected results to a group of respondents to see if the total results and conclusions reflect their collective versions of reality? Do they see themselves in the mirror when they hear the results and conclusions?
3. Researcher can send a temporary report to some individuals or a selected few of the respondents to give a feedback on the originality of the content of the report. Does the content give a true reflection on their individual or collective version of reality?

But the strategies just mentioned are not absolute and the researcher can still come up with a queer conclusion that doesn't necessarily in agreement with respondents' surface understanding. The reason for this scenario is according to Jacobsen, the nature of a research is usually to unearth hidden issues in a given context and therefore the researcher ``might discover some surprising facts that the respondents weren't aware of``(Jacobsen, 2015 , p 234)

To validate whether researcher's depiction and interpretation of reality is correct and whether the conclusions are true reflection of the results, Jacobsen proposes that the researcher must critically reflect on whether the results could change if the categories on which the data was computed is altered. Another critical aspect that the researcher should be watchful about is that often what you see or hear about the cause of a certain problem might not actually be the true cause. In that respect, the researcher should critically reflect on whether this mismatch can negatively impact on the conclusions to be drawn (Jacobsen, 2015)

External validity is whether the results from the survey can be generalised to wider populations. The generalization usually takes two shapes namely whether results from few units in a case that participate in the research can be generalised to other units within the same case that don't participate. The other way is whether results from the research case can be generalised to other cases that are not being researched on.

To increase external validity, the researcher ought to increase the number of units being researched on-the higher the units-the higher the possibility of generalizing. The way the units were selected can influence on the generalizability of the results. For instance, according to Jacobsen, selecting the most typical units as in the one which resembles what the average unit in that category can make it possible to generalise the results. This approach can be problematic because as discussed earlier under selection of participants, we might end part up with the most typical or most extreme trap. To avoid this the researcher can choose units with good spreading as in those that reflect the most extreme, typical or moderate(Jacobsen, 2015, p 240)

Validity assessment in this research

The source of information in this research are post workers and their immediate leaders. Lean implementation goes in all the units that participated and only permanent workers that are assumed to be in the job most of the time were selected to participate. In this regard both the source and participants capacity to give information are assessed to authentic something strengthens the validity of the results. Further pre-testing of the survey questions was done prior to the real survey to ensure the whole research is not vague and to help respondents give a true reflection of reality.

The context in which the quantitative survey was done in this research might have had a negative impact on the internal validity of the data collected. The survey questionnaires were distributed by first-line leaders to their subordinates who were also responsible for gathering the responses. Apart from one-unit (not all participants and just 2 weeks before collection) no envelopes were given for respondents to put the anonymous surveys. However, in all the units, respondents were to put their responses in a specified lean-marked boxes that were to be collected by their leaders after the 4 to 5-week period. Further, specific indicators that were assessed to reduce anonymity of the respondents were omitted from the questionnaire. For instance, no names were asked and variables like age and number of years worked in the post were given in range. What the researcher can`t assure is whether some respondents self-censored their responses for fear of being anyway discovered by the leaders through handwriting recognition and other means. Both the possibility and probability of this happening is assed to be there something that lowers the internal validity of the results

The researcher is an employee of the organization being researched and therefore the transparency of the researcher in presenting facts as it is can be questioned. Jacobsen(2015, p 57) says that this type of researchers might self-censor themselves by systematically avoiding to present critical things they found for fear of repercussions and risk of losing their jobs. The researcher will reflect on this while analysing the results and drawing conclusions on the results but whether the researcher's situation reduces the validity of the results and conclusions, the researcher leaves the reader to judge for himself/herself. On the other hand, being an insider can help strengthen both the

internal validity and the external validity of the research. For instance, the researcher can easily verify the authenticity of the source of information and whether the information gives a correct reflection on reality. One of the ways to audit internal validity was to send a temporary report to individuals or groups to see their reaction (do they see themselves in the mirror when they read the report?)(Jacobsen, 2015). In this sense, does the writer see himself in the mirror when he reads his own report? With all other factors remaining constant like personal motives not being there, then doubling as a native (insider participant) and researcher helps strengthen both data validation and generalization of the results.

Because the quantitative survey was anonymous, it wasn't easy to confront the respondents with subsequent interviews to test whether there is mismatch in their responses from two methods. Therefore, this absence of data triangulation might have negative impact on the internal validity of the results.

To increase external validity of the results the number of units within the case organisation were increased. Results from five units might not be enough to represent over 100 units in the post mail sector something that may reduce the external validity of the research. However, the units studied are assumed to be typical of any post distribution unit in Norway post. In other words, they have more similarities than differences. Based on researchers experience as a postman, most distribution centres have almost similar standard mode of operations as stipulated by rules and regulations laid down by the parent organization. This might have post impact on generalizability of the results from the few participating units to the rest of non-participating units.

Research shows that providing envelopes for the sake of anonymity assurance might have a profound positive effect on the number of people willing to participate in quantitative papers surveys(Støle & Ekeren, 2015). Since envelopes were not provided, this might have had a negative impact on the number of workers who participated in the survey. The target of the research was 100 participants and those who responded were 76. Even though the number of final responses is subjectively assessed to lie within acceptable margin, the number could have been higher if envelopes were provided. As

such, failure to provide envelopes might have weakened the generalizability of the research.

3.10. Ethical consideration

Ethics is `` the doctrine of morality, that is the difference between right and wrong. In the context of research, this means that the researcher should act reasonably, show consideration for the research objects and exercise social responsibility``(Løkken et al., 2015, p 30)

A research is a process and not one-time event. That means that the researcher has a duty to think about ethical principles in the whole process of carrying out the research and not only at the beginning or the end of the research-in other words all the time. Repercussions the research may have on the researched and others should be illuminated earlier on, possibly before even the research begins but review should be done all the time whether the researcher has been compliant with set moral principal goals and on whether it is necessary to take some measures to protect the researched and others from unintended harm (Jacobsen, 2015, p 45). Part of the review includes on what in the research circles is called researchers-effect. Buerstad and Didriksen (2014, p 39), say that `` there is always a relationship between the researcher and the researched something might bring the objectivity of the researcher into question``. As such, the researcher should as much as possible strive to achieve objectivity in his research (Buerstad & Didriksen, 2014)

Not limited to researchers only, but a huge problem for many people trying to make decisions or do studies that can affect others is the problem of trying to strike a balance on the thin-line between what is morally correct or not. This is called ethical dilemma. Nevertheless, when it comes to research, there are some proven convectional guidelines the researcher can follow to take care of the ethical aspect of his/her research. For instance, there are ways in which anonymity and confidentiality of the respondents can be secured. There also guidelines that emphasizes on how to about when getting consent to participate in research from respondents. There are also government agencies that have set guidelines to be followed by all researchers to protect the privacy, personal freedom and integrity of the respondents.

3.10.1 Norwegian centre for research data(NSD)

Norwegian centre for research abbreviated as NSD in Norwegian, is an institution that is mandated by law for archiving all researcher data in the country and helping and guiding researchers navigate the legal aspects of doing research that touches collecting privacy sensitive material(NSD, 2018). From May 25, 2018 there come the so called GPDR data rules from EU that has escalated the data protection rules and regulations to a new level. As mentioned in the introduction chapter, Norway is not part of the EU but is obliged to internalise most of the laws emanating from EU headquarters in Brussels. NSD has already internalised this rules and modified some of its procedures and guidelines for fulfilling the requirements to carry out research that touch on privacy issues in the country(NSD, 2018)

If a researcher is in doubt or thinks that his research might have consequences for the researched in terms of legality of doing the research or securing the privacy protection of the researched, then he/she is obliged by law to report the data protectorate on where and how he wants to carry out research. They researcher must state in the official NSD forms how he/she will protect the privacy and integrity of the persons or institutions participating.

This research employs the mixed method. In the quantitative part, participants were required to indicate albeit in range how long they worked for Norway Post and their age. Part of the objective was to find factors that may enhance or hamper employees' participation in ongoing lean project. Therefore, they were asked on their perspectives about their leaders i.e. on whether they are given enough autonomy to do their work, if the working climate (interpersonal relationship is good) etc. In qualitative part only three leaders were interviewed which made it easier to identify them from eventual research results and conclusions based on what they said. After weighing on these issues and the will not to harm the respondents' privacy and integrity, the researcher consulted with the research supervisor who advised the researcher to report and get a consent of doing the research from NSD. NSD standard forms were filled and submitted in January 2018. The research plan was approved 3 weeks later with few recommendations for change. It is important to note that NSD has modified it is official standard forms in line with GPDR guidelines. This has happened before this research was finished but due to time constraints the researcher couldn't verify on whether the change will affect ongoing projects that were approved before the new directive took effect.

Voluntary participation

`` A fundamental prerequisite in attaining consent is that the participant is informed that participation is voluntary and should be informed the ups and downs of participating``(Jacobsen, 2015, p 47)

In the information letter enclosed with the survey questions, respondents were informed explicitly that participation was voluntary and that even if they participate, they could still withdraw from their responses by informing the researcher or they could contact researcher's supervisor if they needed some clarifications on issues. The email contact of both the researcher and the supervisor were provided in the information letter especially for this purpose.

Jacobsen(2015, p 47) argues that voluntary participation may not be that voluntary after all. He says that sometimes some people who never wanted to participate in the survey may be compelled to do it because `` everybody is doing it``. He gives an example of a situation where those who participated talk positively about the survey and those who didn't might feel morally obliged to do the same. This seems logical since in our strategy studies we learnt about the network effects. In strategy, an example of network effect is where for instance, customers start buying something if the see many others do it. Network effect can however be used to explain other life situations where people like doing things because many others are doing it. The researcher can neither confirm nor deny whether such a thing occurred in this research.

Privacy protection

In the research, some of the questions were considered to privacy sensitive. It was therefore decided to anonymise the survey by not asking person specific profiles like names, exact age etc. Research shows that over 70% of lean success depends on leadership(Roth, 2006 and others; SVÄRD, 2016 and others). Based on this earlier empirical evidence and the objective of the study which was to find factors that could influence in employee lean participation, questions on workplace leadership were asked. The answers from the employees' perception of their leaders' approach to lean was considered sensitive in this research and the author decided therefore to anonymise all the participating units to protect the leaders from victimization in case their unit's responses don't look favourable.

During qualitative interviews, with the consent from the interviewees, audio recording was done. Notes were also taken during the interviews. To protect their anonymity, informants were informed that audio records and other materials taken during the interviews like notes will be deleted at the end of the project. This was also a condition from NSD`s side all recorded material be it video, audio or otherwise be deleted at the end of the project and that NSD will contact the researcher around the time of project finalization to ensure that privacy sensitive material was deleted.

One of the source of sustainable competitive advantage for many companies is the ability to hide their strategies behind their success. There are also laws that protect intellectual properties. In this regard some information might be regarded confidential by the companies to hide their strategies from their competitors. During the interviews the researcher got some intern documents which shows how post distribution centres do their quality controls and set standards. The researcher asked the consent to publish the material from the leader who shared with him.

Studying own organization

One of the ethical dilemmas of doing research in one's organization is that the motive of researcher may be questioned(Jacobsen, 2015, p 57). Questions like does he/she want to

expose loopholes that he/she already knows about? Is it a mission to settle earlier scores? Is the researcher a hired gun working for someone in the organization? If this kind of perceptions exists, the objectivity of the researcher and the whole research might come into suspect and its outcome might be rendered so controversial that it becomes valueless. In this kind of situations, Jacobsen advises that the researcher should reconsider of going ahead with research(Jacobsen, 2015, p 57).

Many of the employees especially those working with the researcher knew long before lean came into our unit that the researcher is a business student. Further they were informed both formally (through the information letter) and informally through inter-collegial socialization that this was purely a school project but that the outcome could be beneficial to the company. Other participating units are assumed not to be affected by this ethical dilemma since they don't know the researcher personally apart from the information in the information letter which says the research is a school project and nothing much about the researcher. See the information letter in the appendix.

For the sake of clarity, the researcher wants to assure that doing this research came as mixture of fate and luck. The researcher has economic management as his speciality and it is mandatory for all master students to write their thesis within their specialization. In this case management economics. Lean serves this purpose since it is a tool widely used in managerial economics to help managers optimize resource usage by increasing revenues and cutting down costs. Since researcher was fascinated by lean ideology during both strategy and logistic courses and wanted to write about lean anyway in the thesis and lean implementation was going on in his organization, he found it easier to write his own company after doing ambivalence evaluation (Considered benefits against drawbacks with benefits winning like access to key persons, information and easy data gathering)

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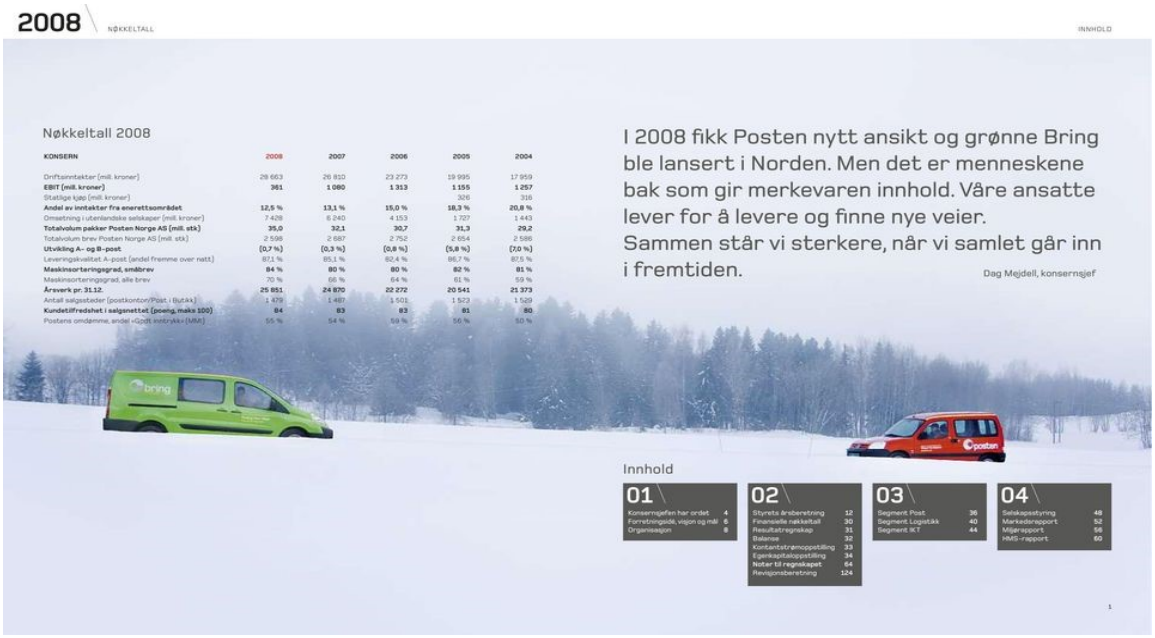
4. Case object presentation- Norway Post ltd

In this chapter, the research case will be presented. First a brief overview of the case object`s previous, recent and current history will be provided and then followed by an illustration of the case object`s structure system and a diagram aided by a description showing a simplified overview of the case objects product flow which is the mail movement system- to precise from collection to delivery. Thereafter, the problems that the case object faced that forced it to implement lean will be described and the mitigation plans the case object put in place then to contain the situation then and in the future. Finally, how the case object is using lean philosophy to improve its productivity and social coherence in its workstations will be presented.



Picture 2: Source: Norway post annual report 2008 page

4.1. Posten`s history is told

The history of Norway Post is tied in the hip with that of King Magnus Lagabøters (1263-1280[3]) (Rusten, 2003). Before the 13th century, the country never had universal laws that were applicable in all parts of the country. Each region, sub-region or valley had its own laws. To consolidate his power and strengthen his position in the ancient parliament, King Magnus ordered new laws to be written that were to be applicable in the entire country. The

[3] Ruled the country between 1263 and 1280.

new laws which came into existence from 1274 however differentiated the differences in need for the settled urban communities and the farming rural lands. For instance, most farmland laws particularly targeted rural areas and farmers while property laws were for the urbanities with common denominator being that the laws were centrally formed by the governing regime of the time. With these laws, all other pre-existing laws were rendered null and void and regional kingpins and village leaders were to be subjugated under the king's empire and lordship (Rønning, 2016).

Part of the 1274 laws transformation was a new law about communication and information spreading. The king wanted news and directives emanating from his government communicated to the entirely illiterate population of the time. The role of decimating the information was entirely given to the church leaders and a few entrusted people who would spread it by word of mouth(Rusten, 2003). Most historians however set a much later date as the time when an organized post network activity begun in Norway- nearly four centuries after the rein of king Magnus Lagabøters.

Magnus laws applied up until Norway joined a union with Denmark in 1537. The Danish king, Christian the third was ruling both countries. As part of his strategy to consolidate his power, increase state presence, stimulate economic growth and increase revenue collection for the state, king Christian ordered the existing laws to be reformed. In 1647, a Danish state secretary representing his highness the Majesty the king of Dano-Norwegian empire in Norway established a post system(Postverket) that was to offer post services. A Dutchman by the name Henrik Morian was assigned this task for a fee agreed between him and Hannibal. Most of the post workers at this juncture were farmers who distributed post without wages but were instead exempted from mandatory military services(Rusten, 2003). The company continued to be ran by private state actors up until 1719 when the government overtook full running of its affairs(Rusten, 2003)

4.2 Norway Post in recent times

From 1719, the company went to through a lot of metamorphosis partly because of change of state regulations that defines its role in the society and as part of its strategies to respond to shifting market demands and competitions. For instance, from 1996 the company was no longer under state administration and laws were reformed to the effect that the company could run like a business entity (Bakstad, 2009b). The reason for this was according to Gro Bakstad , to give the company the flexibility they need to make quick decisions and timely respond to market changes(Bakstad, 2009b). Around this time, the internet of things was slowly but steadily increasing with electronic mode of communication started to get used. Despite the effects were minimal at the time, the company was already to figure out what these new changes will have for it is operations in the future. In this climate of confusion, the state decided to convert the company from post system(Postverket) to a special law company(Posten Norge BA) from 1st December 1996 to make it more competitive(Bakstad, 2009b). From 2002, the company. Part of the intention of this latest reform was to thrust the company more dipper into looking like a bona fide business entity with opportunity to diversify its core businesses, enter new markets and go into alliance with others if the market situation demands such responses(Pedersen, 2014, p 10). Below is an illustration showing Postens from its inception to date.

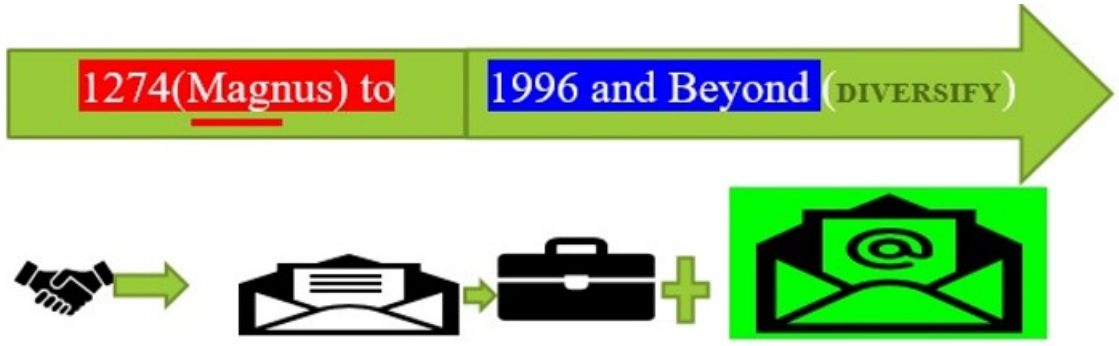


Figure 6:Norway post milestone from 1274 to date

4.3 Norway Post today and outlook for the future

Key latest figures for 2017 (Posten, 2018)

- Present- In all countries in the region
- Total number of workforce- **17226**
- Operating revenue- **24678**
- Post retails shops **> 1000**
- Number of post terminals - **3**
- Number of post offices **30**
- Absenteeism due to sickness- **5.8 %**

FIGURE 7: MAP SHOWING POSTEN`S PRESENCE IN THE REGION (POSTEN, 2018)

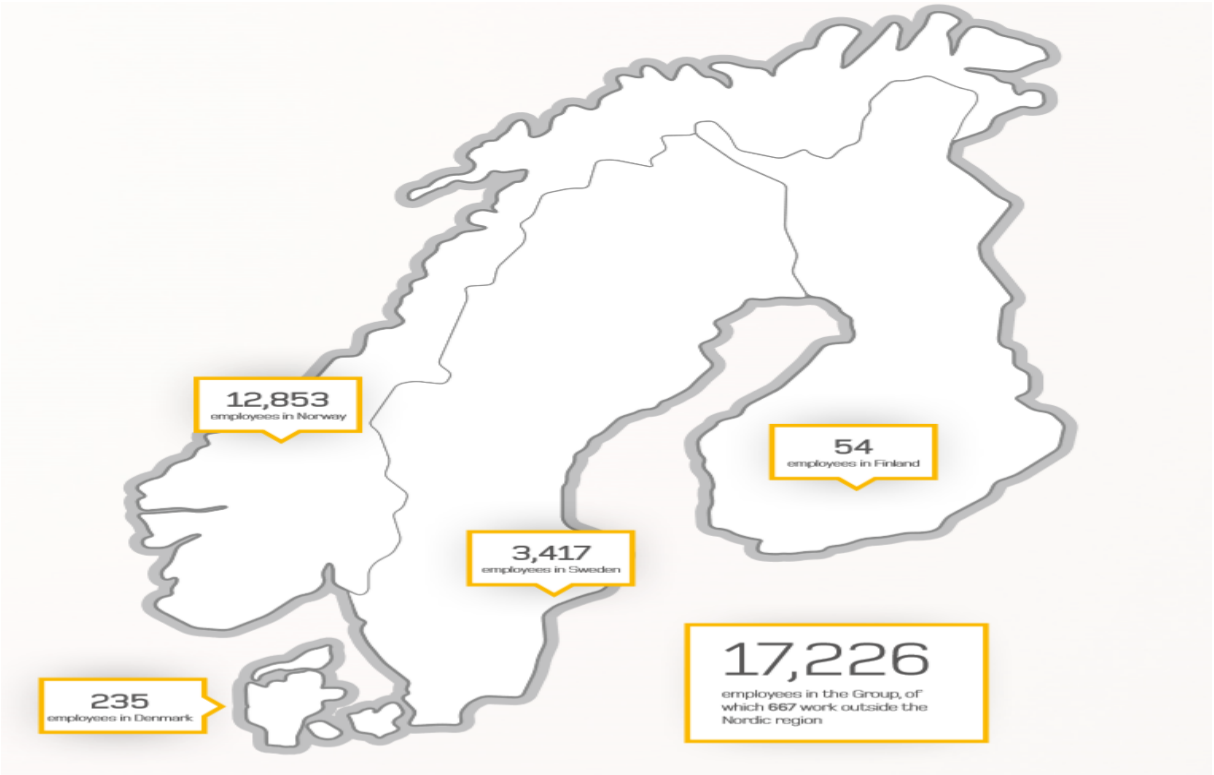
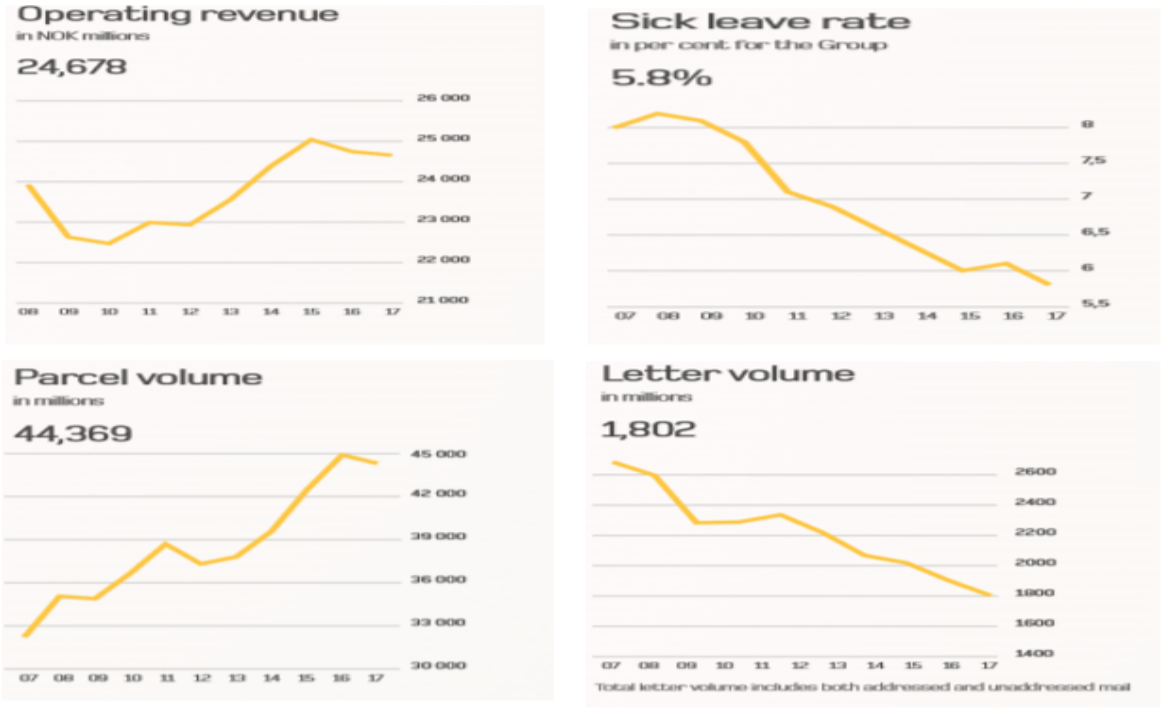


FIGURE 8: SHOWING LATEST FINANCIAL AND OTHER KEY PARAMETERS FOR FINANCIAL YEAR 2017(POSTEN, 2018)



Today, Norway post locally known as Posten is a state owned public limited company that is responsible for the distribution of post around the country in line with the universal service obligation act(USB). The company has more than 17000 strong work force that is helping it execute its social assignment as mandated by the act (Posten, 2016a). Up until recently, the act gave the company the sole monopoly to collect, sort out and deliver addressed and unaddressed small letters weighing under 100g, parcels, newspapers etc. to all households and private businesses across the country as per law established. From January 2016, the monopoly clause has been amended paving the way for full competition in all aspect of post-delivery. However, the company is obliged to carry on business as usual as if the clause was still intact. As made possible by the recent structural reforms, the company has now regional presence in both the small letter and parcel business but more in the parcel distribution. The company's revenues for 2017 were NOK 24678 million with the logistic section generating 63% of the total revenue and the rest 37 % from post services. In 2008, the logistic section contributed 46 % of the total revenue while the mail - and IT section contributed 37% and 17 % respectively. Nearly 14% of the total revenue comes from its international investment (Bakstad, 2009b). The figures support what the post services are reporting about the effect the changes of the last 20 years have on their businesses. One can easily see that the mail and logistic sections are swapping roles. One is going down while the other is striving well.

4.4 The Group`s structure

The company structure has changed several times in the last two decades as part of the structural reforms to make it easier for the company to confront the challenges associated with technological and social changes taking place. The company has for example moved from the military style hierarchy structure to a more flatter organizational structure with less bureaucracy and more flexibility in decision making(Abrahamsen, 2009). The company has two main brands-Post and Bring- with post section mostly specializing in distribution of traditional post to private customers in the homeland market while Bring provides logistics solutions to customers in both the homeland and the Nordic market (Pedersen, 2014, p 49-50). The organization has further four divisions. The mail division which is responsible for the distribution of traditional post and development and manning of secure end to end digital mail system they call digipost[4], the logistics Norway division which delivers logistics solutions in the domestic market for example parcel and express deliveries. The logistics Nordic division does similar job as the logistics domestics division in the Nordic market in close collaboration with the e-commerce division. The e-commerce division supports the other divisions by developing integrated platforms that can enhance service delivery to customers. It is also tasked with coming innovative solution that serve the groups largest customer base which is the business to business section (B2B). Below is an overview of the current company flat structure. This thesis is delimited to the mail division and specifically district 2 of the mail division which is based in Oslo region.

[4] Digipost is short for digital post. It is a secured online platform that the state and companies can send mails and other information securely to the customers, workers or members of the public.

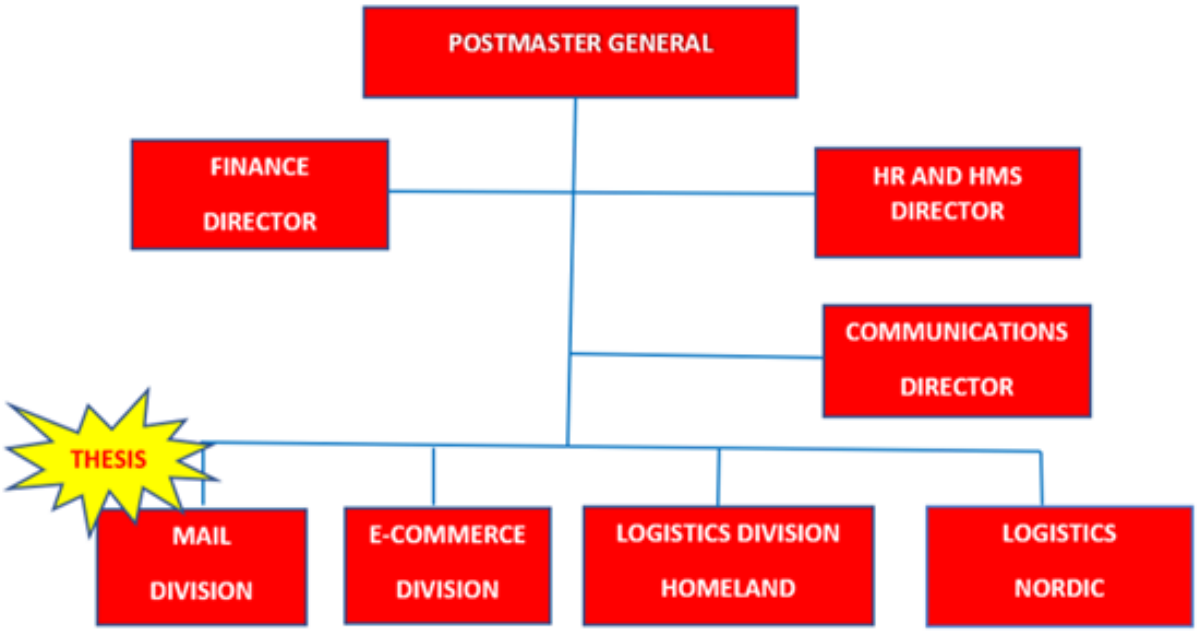


Figure 9: Latest structure of post group

4.3 The mail division

The mail division is responsible for daily collecting, sorting and distributing posts to both private and business customers across the country as mandated by the universal service act which gives the company the mandate to execute this social assignment on behalf of the government. Recently, the company has entered a partnership with city mail of Sweden and now fully competes for post delivery services in the Swedish market.

The division has a network of distribution centres across the country that is responsible for the distribution of posts to the final customers. The distribution centres are organized into districts with each district having few distribution centres under it. Further the districts are also grouped into regions which come directly under the mail division. At the lowest base level, the frontline distribution leaders help the company distribute the posts to its destination. The frontline leaders are directly answerable to the district heads(district managers) who are posten`s point men in ensuring service quality at the process-end. It is the districts heads who head hunt and employ capable first-line leaders who can execute

this final mandate as stipulated by law within the mutually consented contract by both parties. The districts heads also help in ensuring smooth flow of the post processing between main post handling terminals and the final distribution centres. Further, the district heads report to the regional leaders via the formal channels or through organized meetings about the challenges and needs at the grassroot levels. The regional leaders or sometimes directly by the district heads, report to the groups top most executive leaders who make strategic decisions based on the reports they get from the down-stream leadership, yearly reports and advices from their consultancy strategic teams and communication department(Posten-Norge, 2018)

4.4.1 Mail processing order

The objective of this thesis to map out issues that must be in place to increase employees' engagement in ongoing lean activities at the distribution centres. As such the thesis is limited to employee perceptions at this lowest units and it could have been expedient to only show the final processing part before delivery to end customers. But for the sake of clarity, a brief overview of the whole process from collection to delivery will be highlighted.

The mail processing systems is a long and tedious process that encompass the use of vehicles of all types, aeroplanes, boats, trains, small hand wagons, motor-cycles and even physically distributing post to the final customer by foot sometimes. Previously the process underwent four stages before it reached its destination namely collection-sorting at terminals- then sorting at distribution centres and finally delivery. From between 2010 and 2013(depending on where you are in the country and completion of major sorting terminals) the stages have been reduced to three namely- Collection-sorting at hub-delivery. Below, a description of the mail movement steps based on the current routines is presented.

STEP 1- COLLECTION

The process begins with a customer drops his mail or parcel at the designated mail boxes placed around the country or at the nearest post office or post office retail outlets. From there a post carrier collects all the posts from all these places and takes them to the nearest sorting terminal. There were 9 post sorting terminals, but this were reduced to only 3 from 1. January 2018 as part of the mitigation measures against the plummeting mail volumes.

Part of the measures which took effect from the same date included converging the express post(A-post) with economic post(B-post). Earlier the A-post were to be delivered over-night and the B-post within 2 working days. From January 2018, the A-Post service was abolished, and all became B-post.

STEP 2- SORTING OUT

In the terminals the mails are first sorted by size for example small letters and big letters. The same goes for the parcels. Almost all mails in Norway have unique florescent codes that identifies the letter. The letters and parcels are such put into quick scanning machines that sort them according to the postal codes of area of destination. All post that belong to other regions with their own terminals or to outside the country is placed in special trolleys for further transport. The terminals within the country work almost in similar function with processing routines standardised. If the machines can`t read the name of the receiver especially in handwritten letters and parcels without florescent codes, then they put in labelled trollies and given to a team that is tasked to manually sort out all these kinds of letters. Once the sorting is complete, the post is then transported to the final distribution centres where a ready postman takes with them by car, mechanized hand-wagons, moto-cycle or sometimes by foot using pulling carts and then delivers them to final recipient. Work at the main sorting terminals is almost non-stop with workers going in shifts

STEP 3- DELIVERY

Delivery to the final customers is usually done within the normal working hours from 8 to 16 with a few exceptions depending on the mail volume for each specific day. The author wants to point out that the processes of collection, sorting and delivery just explained has been the same always. The process has always been altered in-line with all the changes happening in the post. Below is a diagram showing the mail processing order.

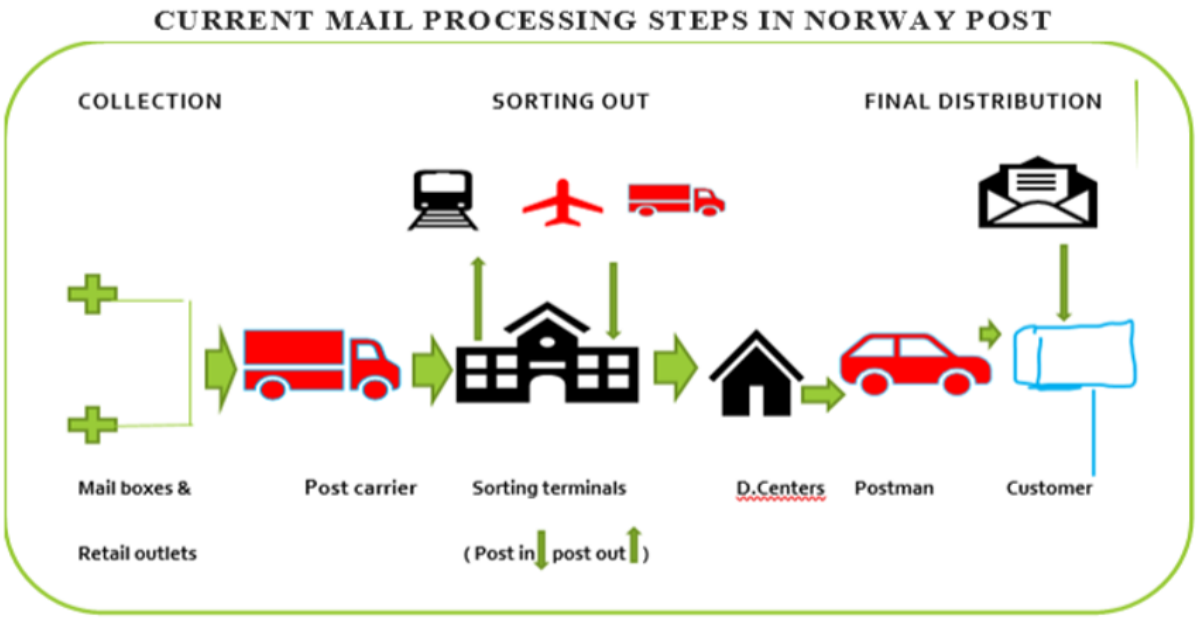


FIGURE 10: SHOWING MAIL PROCESSING IN DISTRIBUTION NETWORK. SOURCE AUTHOR. INSPIRED BY (NILSSON, 2012, P. 3)

4.5 Challenges of the last 2 decades

Norway post has always strived to better the quality of its services through a combination of techniques and strategies. Being the oldest company in the country (and even some claim the company is older than the country itself if we assume away the time before 1814- when the country got it is own constitution and self-rule from the Danish monarchy), the company dwells in the folks' conscience and the changes it went through all along is part of the Norwegian narrative of how long the country has come.

At the turn of the millennium the company faced daunting challenges. The company`s profits were going down while the operational costs were spiraling upwards. There were quality issues in its services and inefficiencies in its processes were wide spread. The number of absent employees due to injuries and other ailments was rising. The customer satisfaction index showed a worrying trend(Bakstad, 2009b). The company has survived through hard times in the past like the first world war, the great depression of the 1930s , the second world and the Nazi occupation of the homeland, the oil crisis of the 1970s, the cold war but none of those mentioned calamities has had a profound effect on the company`s existence as the challenges of the last 20 years or so. Some of these new

challenges included digitalization, liberalization of the European post market and increased globalization, climate effect awareness- going green movement and frequent amendments of the local post regulations. Other challenges include increased competition and changes in consumer preferences.

4.5.1 Challenges of digitalization to Norway Post ltd

``Digitalization is a megatrend. Everything that can be digitalized is expected to be digitalized``(Posten, 2018)

The improvement of the computer processor and the creation and commercialization of the world wide web which gave the ordinary folks the opportunity to access the internet has turned the convectional ways and strategies of doing business upside down. For Norway post, this new development meant a mass migration of bulk of its customers from traditional post to electronic mode of communication. The mail business reached its peak at the turn of the century before taking an abrupt nose dive but didn't fall in the surface yet. According to numbers presented in document player in 2015 which can be accessed at http://docplayer.me/68327764-Gevinstrealisering-fra-lean-i-et-nordisk-post-og-logistikk-konsern.html, shows mail volume has between the years 2000 and 2015 reduced by 47% and projections for the years until 2020 shows a further 40 % decline. By 2020, the total reduction will a whopping 87% of what the volume was at the turn of the millennium. The decline is expected to continue beyond 2020 according to projections made by the company in its recent annual reports. In terms of numbers the decline means from 1.6 billion letters in the year 2000 to less than 500 million letters in the year 2020. The decline is expected to continue beyond 2020 according to projections made by the company in its recent annual reports. Numbers from for instance, Posten`s 2017 financial report shows a distressing scenario. According to the report, each household in the country on average received 3.9 letters per week and estimates for 2019 and five years beyond shows that each household will receive 3 letters and 2 letters respectively(Posten, 2018, p 16). In monetary terms, the company`s revenues from the mail segment declined by NOK 145 million compared to year before. While the revenues from the mail sections continue to decline the operational costs

attached to it seems to be increasing with increase in salaries in line with general increment in wages in the country. For the mail sections, the wage bill is a whopping 60% of the sections total costs(Gabrielsen, 2009, p.5). Norway post thinks this isn't sustainable in the long run and has therefore put in place some mitigation measures to reduce the impacts this will have on the company`s total results and growth prospects for the future. The type of measure will be discussed under the mitigation measures section.

Digitalization also brought opportunities for renewal and growth for the company. The increased internet access has allowed business owners to wholly or partly sell part of their merchandize by online. People buy things online from all spheres of the globe. Norway post knew that these shops don't have the capacity to create a network of distribution that will reach every customer that buy things from them online and are such positioned themselves to tap from here. As a result, the logistics section has grown significantly in the past two decades significantly compensating for decline in revenues from the mail section(Posten-Norge, 2018). In the year 2017 for example, the logistics section boosted the company`s economy with NOK 16.533 million which makes up nearly 70% of the organizations total earnings in the financial year 2017. Parcels and home deliveries made up the biggest chunk of the logistics revenue(Posten, 2018, p. 16)

4.5.2. Liberalization of the European post market

Part of the EU project is free movement of people, goods and services within its member states. This together with the increasing trend of globalization and digitalization that disrupted the convectional business operations made it necessary for the organization to carry out regulatory reforms that could in principle remove the remaining stumbling blocks to achieve total free markets within its borders (EU, 2018). As part of the free movement policy, EU initiated a post reform policy in 1997 that laid down regulatory framework that was intended to effectively make post services more affordable, improve quality of providers services and also make member states to gradually get full access to each other`s post markets(EU, 2018). The first post directive came in 1997 (directive 97/67/EC) and were then subsequently reformed by new directives in 2002(directive 2002/39/EC) and 2008(directive 2008/6/EC). The directives expected member states to carry out internal reforms that will eventually completely open the most markets. The last directive directed

its member states to completely open up their post markets within two years (Asquer, 2010, p 7). At the same time, member states were encouraged to continue to provide universal post services to its populations in line with the universal service act. However, according to DR. Alberto Asquer ``member states were given the flexibility to provide the universal services directly or indirectly within the market forces``(Asquer, 2010, p 7; Rusten, 2003, p 2)

Norway is not part of the EU but is obliged to implement most of the EU rules and directives in return for having full access to EU`s internal market through the European Economic Area agreement(EEA)(Regjering, 2017). As a result, Norway has over the last two decades gradually made reforms that paved the way for full competition in the postal services. It has for example abolished the post`s monopoly on collection, sorting and delivery of small letters under 100g from 1.January 2016 something that effectively set the EU`s third post directive into full force which in essence fully liberalized the local post market (Posten, 2018). The government hasn't however changed the Universal service obligation act which requires Norway post to shoulder the burden of provision of post services to every household and business in the country(Samferdselsdepartementet, 2018)

4.5.3 Intensified competition and increased consumer empowerment

The change of era in post service business areas and focus is depicted by the change of Norway post`s business motto which changed from…

No one knows Norway better → **We make everyday life simpler and the world smaller**

The upshot of liberalization of post services is that private and state owned companies are no longer restricted by regulatory state borders that made it nearly impossible for outsiders or other internal private owned companies to fight for the customers wallet share beyond their borders and business areas (Bakstad, 2009b). With enhanced digitalization, globalization and significant increase in the reduction of tariffs, new market opportunities emerged. Companies who are no longer limped by regulatory borders started to employ different strategies to grow and enter new markets. Some started direct investments, acquisition of already established viable companies while others entered a joint venture with others. For instance, Gro Bakstad, who was earlier part of Posten`s strategic think tank team and currently the groups CEO in charge of the mail division wrote in her 2009 article

``strategy for restructuring in Norway post`` that the changes had put the Nordic post market in fire-and things are no longer the same. She gave an example of the Swedish post and the Danish post which merged to form a special law company (PostNord AB) something that effectively handed them a dominant role in the Nordic post market (Bakstad, 2009b). She further says that even though the Swedish national post (Posten AB) has had a presence in Norway for some time through its subsidiary affiliate- Toll Post globe which specialized in logistics and the Strålfors which specialized in information logistics , this latest new comer together with others from rest of Europe for example German owned DHL and Schenker and many others have significantly intensified Nordic post market competition (Bakstad, 2009b).

Even though the new post directives have opened the floodgates for competition in a level unseen before, Sweden has indeed practiced liberalization long before the directives were initiated and enforced. Already in the 1990s, Sweden liberalized its post markets. Immediately thereafter the city mail post company was born and started competing with the Swedish national post company in collection and delivery of post especially in the urban centers (Dagens, 2006). Albeit being a late mover, Norway post too has joined the bandwagon. Already in 2002, the company bought 57% of shares of Swedish citymail compony and later on in 2006 fully acquired the whole company (Dagens, 2006). According to Dagens, this meant that Norway post could freely compete in Swedish post market already from 2002 but continued with its monopoly regulation in its own post market. The articles says this infuriated the Swedish which saw this as unfair (Dagens, 2006)

With reduction of the use of physical letters, new opportunities are emerging in the logistics section made even more possible by the enhanced technological development and globalization. Competition is stiffening, and customers preferences is rapidly changing. For instance, some may require home deliveries, others want opportunity to collect their packages from the nearest retail shops while others want to send their parcels and packages right from their private mail boxes. This means the players have to stretch themselves to meet these new demands by investing heavily in logistics and transport alone or together with others lest they risk being outshone by their rivals in the battle for customers wallets(Bakstad, 2009b)

4.6 Mitigation measures to contain challenges of the last 2 decades

To reduce the side effects and benefit from the opportunities of the changes that is taking place, Norway post initiated a number of strategies that were to help the organization navigate through this new unchattered territory. The digital revolution is unstoppable and society is inceasingly drifting towards electronic mode of communication to the detriment of the traditional mail. At the same time the parcel business is increasing despite at slow pace.For the parcel business specially, estimates in the organization`s annual report shows that an average household receives only 7 parcels per today but this is expected to increase in forseebale future. For Norway post this means that they have to take measures that will help adjust operational costs to the level of mail volume at any given time and focus more on innovation to remain at par with changing market trends.

In 2008, the organization and its top most CEO(the postmaster general) in the forefront initiated arround 20 projects gathered under one umbrella project they named Spinnakker. The project was expected to improve the organizations total performance(Gabrielsen, 2009). In the initial phase, the projected was expected to improve the organizations revenues by NOK 2.3 billion beween the year 2008 and 2012(Gabrielsen, 2009, p 13). According to former postmaster general Dag Mejdell, the spinnakker program has already in 2009, barely one year after its inception improved the organizations performance by NOK 800 million(postavisen, 2009, p 10). Bakstad (2009b) lists a number of measures that spinnakker program was to boost the organizations profitability by concurrently reducing costs and increasing revenues. Below is table showing the measures

TABLE 7: SOME OF THE MEASURES OF SPINNAKER PROJECT. SOURCE:(BAKSTAD, 2009A)

PROJECT-SPINNAKKER MEASURES
• Additional 124 post offices were to be converted into post in retail outlets • A group wide productivity enhancing based on Lean phylisophy was to be introduced • Downsizing staff and support functions to reduce costs • Investment in more efficient and robust IT-structures to reduce IT-costs • A new mail sorting hub/terminal to be eracted in Lorenskøg commune and commissioned before the end of 2010 • Automatization of mail sorting • Estblishment of digital mail box

This thesis is based on one of the spinnaker projects-Lean in the whole group. In the next sub-heading, Norway posts lean project will introduced with special focus on lean in the mail division and specifically lean in the distributions centers and more so distric 2 which is based in Oslo region.

4.7. Lean in Norway Post

Norway Post is faced with two major challeneges that affect its profitability. The first one is continued reduction in mail volumes caused by substitutition of traditional physical mail with electronic mail and the second one is liberalization of the post markets which brought in a competition like none-other. The spinnakker program that was set up in 2008 was meant to tackle this issues plus other quality issues that doged the company after the millenium. Some part of the spinnakker program to improve productivity, quality of services and tailor costs to the level of volumes at any given time, a productivity enhancing program based on lean phylosophy was introduced.

The postmaster general and the rest of the executive wanted lean to be specifically help the organization in improving productivity and create a culture of continuance improvenemt that puts the customer first but also takes the welfare of the workers serious. In a nutchel the objective of lean is mainly 3 things(Posten, 2015):

- Increase Productivity(the most important)
- Improve quality(Customers)
- Improve employees welfare- Reduce abseentism

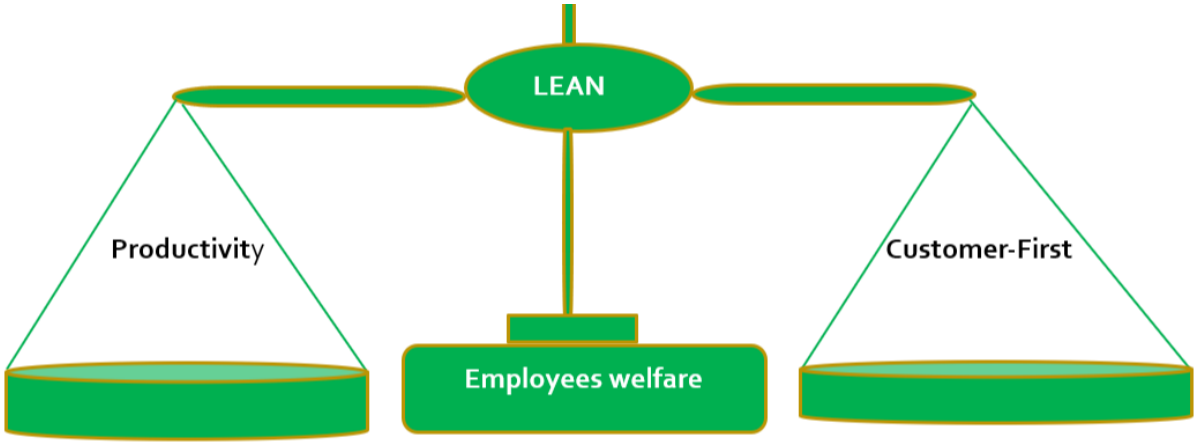


Figure 11: Balancing productivity, customer satisfaction and employees' welfare. Source. Author

The first lean program was rolled out in posten`s goods centre based in Alnabru in Oslo already in 2008. For the results to be quantifiable, the executive management wanted lean to be spread to all the sectors of the organization. First in this endeavour was to constitute the various lean teams under one roof so that they could support all the organization`s sectors in their improvement programs. In 2010, the executive announced the creation of the support team with the name which if translated from Norwegian mean group-wide productivity system(KFPS)(Posten, 2015, p 17-18). KFPS was expected to help the groups different sectors in realizing their set goals that touched on 90% of the group's total costs(Posten, 2015). Apart from lean, the KFPS was tasked in supporting the divisions and various branches in proper procurement to reduce the costs.

The KFPS team was given a structure under one leadership that was directly to report to the executive leadership on what was happening with the lean and procurement project. Under this leadership was a group of lean experts called lean navigators, procurement experts called procurement navigators and coordinating leadership that were tasked to visit the

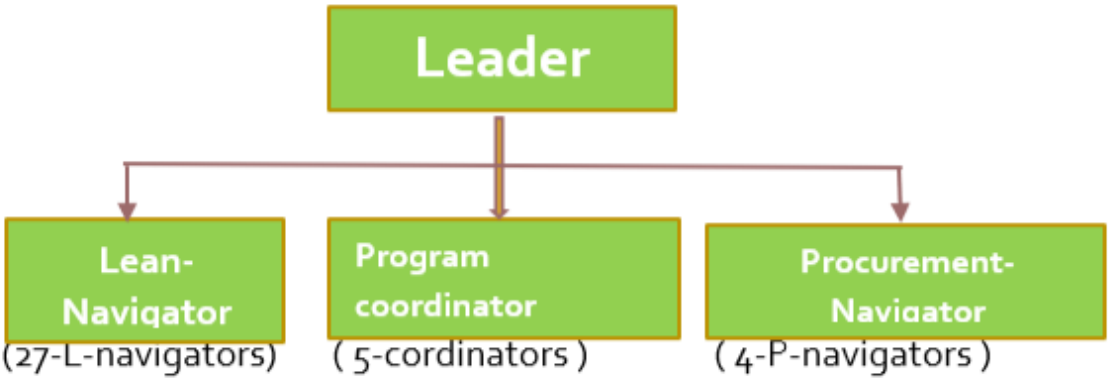


Figure12: KFPS structure

various branches and help them directly in their improvement activities through training, standard setting and documentation. Below is an illustration of the KFPS structure looks like.

4.7.1 Keeping the lean project focused

The main objective of Norway post for going lean in the first place is to help the group in improving productivity by eliminating all activities that were deemed non-valuable while serving the end customer. For this to happen, the company identified four factors that will help give the lean improvement program better structure and focus(Posten, 2015). According to the company, these 4 factors must be in place for the improvement to succeed. According to this article (Posten, 2015), the four factors are:

- Good governance and ownership from the senior management
- Extensive competence building
- Standardized method
- Strict measurement and follow up

The lean projects at various workstations must be standardized. For instance, how lean is implemented in workstation A should be like lean in workstation B considering the two stations have similar daily operations. But first the program had to get accept from the leadership at all stages and sectors in the organization and more specifically from the senior leadership who will should the blame if things don't work out. After that the company through its KFPS team, carries out massive training for all the leaders and employees at the various workstations. Before lean is implemented, a framework on how to follow up and measure the effects is made. More on this framework will be elaborated under the subheading framework for realizing positive effects from lean.

4.7.2 Continuous improvement in distribution network

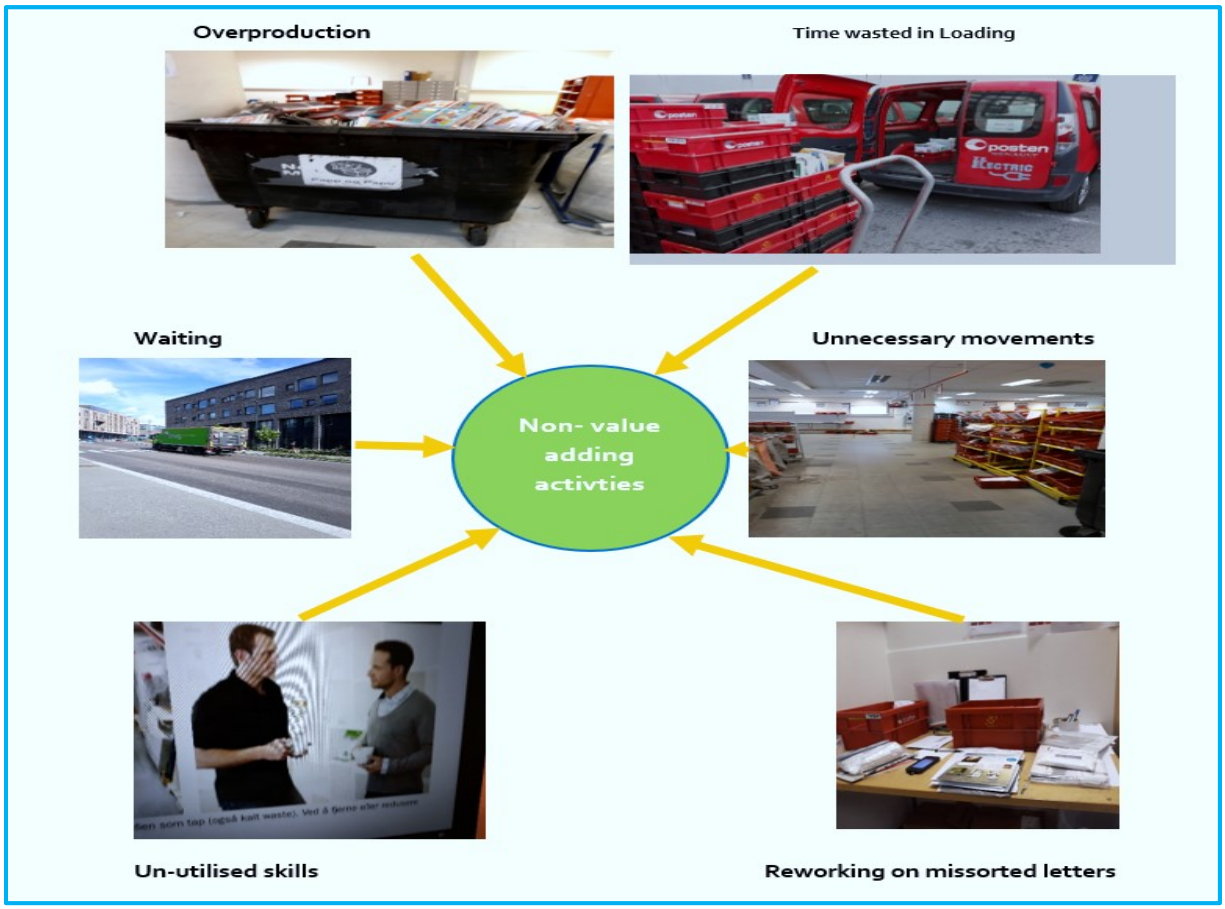
The distribution network is one of the primary targets of posten`s lean mini-transformation. The network encompasses all the processes that are involved in collection, sorting and distribution of Post. In this thesis, only the last stage of the network is researched on-the distribution centres. The clear majority of Norway post employees work in the distribution network which is where the mail volume fall is directly felt and most downsizing of the workforce takes place. It is like the epicentre of the problems the company is facing. No sooner the spinnaker sub-project lean was launched, the navigators were instructed to particularly prioritize the distribution network and they indeed immediately hit the ground running something that shows how important the distribution network is for Norway post. Indeed, 17 out 27 Norway post lean navigators were assigned in distribution network alone. Already in November 2009, barely one year after the project was launched 31 mini-transformations were effectively implemented with majority of them in the distribution network with more than 1100 workers gaining basic training in lean systems(postavisen, 2009, p 15).

They are a lot of wastes in the distribution system from collection to delivery that can eliminated with use of lean techniques. Therefore, for the project to work and fruitful effects gained, the project must be implemented in all the stages of the distribution. For instance, to reduce the amount of time used in sorting out miss-sorted letters, the mail collection team, the sorting team must do a good job first. Then distribution team will team will use less time in handling miss-sorted letters. Likewise, the distribution team must try to sort all

miss-sorted letters differently according to address before they send back them back to the sorting them. The distribution team have better knowledge about the addresses since most of the miss-sorted letters belong to their routes anyway and can do the differentiation with ease. As such the work of the sorters become much easier and the whole system becomes more effective. In the next sub-heading I will touch on some of the wastes that are found in the distribution centres.

4.7.3 Wastes in distribution centres

FIGURE 13: EXAMPLES CONTEXTUALIZED DEADLY WASTES IN DISTRIBUTION CENTRES. SOURCE OWNER EXCEPT PICTURE ON UN-UTILIZED SKILL -ADAPTED FROM POSTAVISEN 2009(POSTAVISEN, 2009)



As I have mentioned in section 4.4.1, the number of stages a mail moves have been reduced from 4 to 3 from between 2010 and 2013. What has changed is that the distribution centres are no longer sorting out the mails themselves. They only do the delivery. The only sorting that takes place in distribution centres will be described in the next paragraph. The reason there is no anymore sorting going on in distribution centres is because Norway post has

invested in major sorting hubs (terminals) with the latest automatized sorting machines in every region. The automatization of sorting is part of the lean project to make the system more efficient, improve quality of sorting with gains being reduced costs as one machine can handle the work that several workers can handle and even more efficient than workers and with less errors.

The wastes found in distribution centres are like those named by Taiichi Ohno of Toyota company plus the latest ``competency waste`` that was added later by lean academics and practitioners. For instance, they are wastes in transport, overproduction, over-processing, waiting, inventory, un-necessary movement, defects and untapped competency. Before we describe what each of these wastes entails in a post distribution world, lets describe how a postman`s working day looks like. Need to clarify that most of the disruption given here are based on authors experience as a postman. Post operations in delivery centres follow the same standard guidelines of delivering post developed by the company. Therefore, assumption is taken that there are minimal differences in the operation of the distribution units. Further we need to clarify that working day is divided into three phases namely: Before going to the route to deliver, out in the route delivering post and rework before calling it a day.

Before going to the route

Work at distribution centres usually begins at either 7am and ends 15p.m or between 8am. And 16p.m. They are divided into two teams with first team arriving at 7 and last team arriving at 8 a.m. The reason for this is that when distribution centres stopped sorting posts, the racking system that took a lot of space had to be done away with. The aftermath was big halls with big spaces that remained unutilized. To save costs of using huge facilities including electricity, rent etc, all distribution centres had to move to smaller buildings (Lean-safe on space). Most of the buildings don't have the capacity to accommodate all post arriving from the sorting terminal. Therefore, the flow system had to be implemented to ensure smooth flow of the process and avoid delays. Independent of when one begins, the normal working hours for postmen is 8hours except few days in a month when the post volume is usually higher than usual. For instance, around Christmas time when people are sending each other a lot of Christmas gifts and cards. There can be one to two days a month when a postman is

expected to deliver extra monthly magazines from company's` like the real estate specialist Obos, the tabloid media house`` See og Hør`` etc. In distribution terminology, these extra days are called `` Full distribution days`` and possibility of some workers using overtime is significantly higher than normal working days.

The sorted post arrives at distribution centres from the main sorting terminal around 8 a.m. the same time workers are arriving or before but rarely later than that. The arrival of post from the hub depends also on the traffic flow of the day. This can affect especially distribution centres that are far away from the hub.

When the postman arrives at the workstation, he/she must log in the attendance register system (WinTid in Posten), then collect car and route keys (which he/she must log in into another key carboards to get them), then collect digitalized route book [5] from another carboard before going to collect the car and readying it for loading. After that they collect their own route post and loading in their cars. So, wastes can occur here while collecting the keys and the car. If the keys and the car are not in a fixed place, then the worker uses a lot of time looking for them (unnecessary movement waste). Workers have different tempo in loading their cars. The post guidelines show a worker must not more than 20 minutes in loading the cars/wagons etc, but some do use more than that. According to working guidelines, the time between post arrives (also worker arrives) and when postman is ready to go to the route should not take more than 40minutes altogether. When the lean team arrived, these are some of the things they were measuring and helping workers who were not meeting targets to map out problems and seal loop holes. Other problems that can occur in the morning hours is when all the post for all the routes arrive at the same something that creates congestion and que system which makes the whole process slowly, tedious and stressful for all involved. This usually happens in the days when the post for both teams arrive at the same time due to external problems like traffic flow problems between the main terminal and distribution centre etc. In some places, they can be poor

[5] The digitalized route book is an iPhone with online app that contains customers addresses and names in that route. It also shows people who have either moved in or out of the addresses, those who reserved themselves from receiving commercials and those who reserved storage of their post for a small fee when they are in vacation etc. The iPhone is also used for communication between workers and their leaders etc.

layout and disorganization in the building that is creating the mentioned problems. Such problems are things that lean can help fixing using lean techniques like 5s.

Out in the route

Things that drive wastes while out in the route can be for example the distance between the route and the distribution centre. The longer the distance the more time consumed (Transport waste). The routes are usually created by computer system and therefore the time workers use in travelling to-and from the route is catered for by adjusting the size of the route to the travel distance so that everything doesn't take more than 8hours including before and after route activities. But the computer doesn't cater for unusual things like ongoing road works which forces driver to find alternative longer travel routes or delivery system (can` access addresses on the other side of blocked roads forcing worker to make unnecessary manoeuvres to deliver the post) or simply usual traffic problems. If routes are not properly optimized, then worker but go in zig zag crossing his own footprints several times and a lot of time might be consumed moving to and from (unnecessary movement waste). If the mail boxes are not properly located, arranged or labelled with correct names, the worker might use a lot of time. Norway post alone can`t fix these problems alone. They must closely work with the government to create legislations that guide people where they should put their mail boxes and they also must corporate with house owners and individual customers through dialogue on ways the problems can be alleviated.

After route rework

The after-route activities look like the before route activities with cars being offloaded (before loaded) and parked at their right places and keys returned to their original carboards. Also, here the time used by the workers varies depending on their different individual tempos. A major time absorbing difference though is the time used in scanning parcels and packages that don't fit into the mail box. After scanning they must be put in a pre-labelled sack with the name of the nearest post office or post retail out of the receiver. This can be time consuming especially if they are many of them returning from the route.

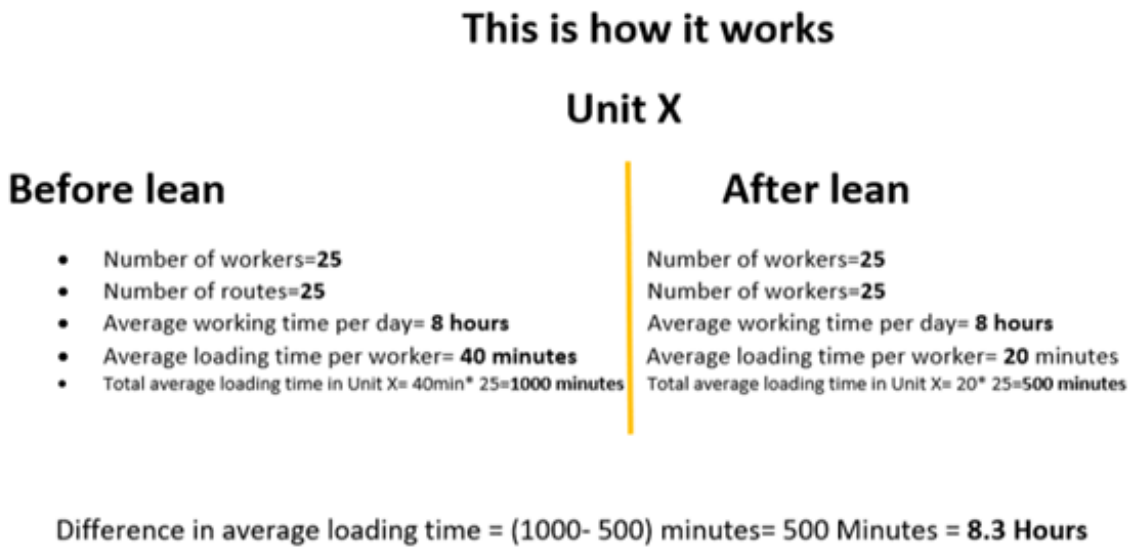
Another thing that need rework (Defects wastes) is the letters and parcels that postman can`t find their owners and has use time googling them in the digital route book for clues

and then label them with ``retour/retur`` and send them back to the sender if can`t locate them in the route book system. Before worker calls it a day, a lot of time is used in sorting out miss-sorted letters according to their sizes and addresses before they are sent back to the main sorting terminal for proper resorting (will be much quick now especially those that need manual sorting i.e. those with handwritten names that machines can't read.

Another problem that affects the whole process is overproduction and over processing problems. Overproduction usually happens if they are many things that are not necessary in doing the work for example oversupply of number of delivery cars consume more parking space with all the costs involved, too much uniform, materials etc that can clock the system specially the building with mobility and disorganization being the resultant effects. Over processing happens when too much commercials are processed than customers need. This usually happens because customers put `` no commercials please or reserved against unaddressed letters`` on their mail boxes without informing Norway post. The system still assumes the customer needs commercials and so continuous to produce. Things like this usually happen frequently reserving themselves against commercials without notice. So the distribution centres need several big containers in their buildings to keep the undelivered commercials before they are taken for recycling. The containers, consume a lot of space causing further congestion in the already stretched buildings and off course it costs Norway post a lot of fortune in first transporting them from the main terminal to distribution centres with lorries and then paying recycling companies to take them away. This is also where lean helps by ensuring workers can prevent such problems by using their visuals in seeing who newly reserved themselves from commercials and then correcting the digital route book so that the processing unit also adjust their figures. As such over processing is minimised, the number of containers need for storing undelivered commercials reduced and the money Norway post uses in transport of undelivered commercials reduced.

From my own experience in the world of post delivering, there are truly many people with higher education or experience that do things they are over-qualified for. For instance, you can find someone who has a university education, worked for a long time in a different sector in the society but because since he/she needs a different experience or they simply like going out than sitting in office, they end up being postman-doing postman things like delivering post, driving post transport carriers etc. Researcher has also seen the same in

different sectors like a former nurse or accountant becoming a kindergarten worker or pedologist etc. The reason could probably be the economy of the country is robust and it is easier to change jobs and the wage difference of the jobs isn't that much. But the bottom line is that like lean academicians and practitioners have warned, a lot of useful skill and experience can get untapped with Norway post case notwithstanding. Below is an illustration of how lean can be used to hunt down wastes in loading time and cut reduce costs.



Consequence

- Number of routes reduced from 25 to 24
- Reduced number of workers to 24 or extra worker used in handling alone missorted post returned from different routes meaning other works go straight home after returning from routes instead of doing manual reworking which takes on average 20minuttes per worker. Whichever way 8hours saved.
- Fuel and vehicle repairs saved

= If 200 units do that in one year that means saving **1660**hours (**8.3*200**) per day or 19920hours **(8.3*200*12)** per year which is equivalent to 200 workers less per year plus all other costs related to having extra route like reducing costs on fuel, vehicle repairs,

insurance etc. The process can be repeated after some time as volume of letters go do. The same can be done in other waste areas like reduction in time used in reworking missorted post, time out in the routes (grouping of post boxes in one collecting point per street to reduce time in going to every house to deliver post. Norway post already has a project targeting condensed urban centres where houses are close to each other) etc.

4.7.4 13 weeks of mini-transformation

The implementation is done in sort of 13 weeks mini-transformations that encompassed all the branches of the organization. Considering the number of navigators available (only 23 lean navigators for the whole organization) and the size of the organization, the mini-transformation takes a long time before it reaches all workstations. For instance, in distribution network alone there are more than 500 work stations spread across the country. So, plans are usually made so that the mini-transformation was rolled out in areas that have the same function or belong to the same district as for example in the case of the post distribution networks. Something quite interesting is that various branches and mini-sectors of the organization can have lean with different names. For instance, lean in the distribution network where this thesis focuses on is called Operational Excellence (OPEX). Further, the implementation plans might differ from branch to branch. Therefore, the description given here is based on my own experience with lean, interview with the various leaders and lean navigator. The description shows how lean implementation is usually done in a distribution centre.

Before a mini-transformation is rolled out in a distribution station, first a leadership training for all the leaders in a district or branch that lean team plans to reach soon were done and then afterwards the teams arrive at the workstation itself to introduce the lean project to the workers and then stay there for nearly 13 weeks mentoring and coaching the local leaders and the employees on lean techniques. While still being at the workstation, the lean team carries out several employee surveys to measure the workers perception on the project and then in consultation with the local leaders adjust how the continuous project should be done

based on the outcome of the surveys. In the 13-week period, the team follows workers out doing their jobs. They have a clock, a pen and a form to check how long it takes the worker to finish any mini-task and then document it in the form. The result from there is used for setting standards. After the 13 weeks are over, the team moves to another distribution centre in the same district or to the next district in the same region if the team has already reached all the units in that district. The reason for doing it in any given district at a time, is usually because units in every district are close to each other and it's also much cost effective to train the leaders at the same time before their workstations are reached because they are close to each other. In addition, this also helps the district heads

4.7.5 Competence building

Lean navigators are tasked with the role of training both leaders and their foot soldiers(workforce) in lean methods and techniques so create awareness, motivation and help sustain the improvement projects. Before a project starts in a certain district, all the local leaders are gathered in a workshop for several days where they learn about the objectives the company has with lean, the methods, implementation, how to motivate workers to embrace lean, how to sustain lean, visualization of effects, how to report the effects and evaluate the project continuously etc. For instance, not limited to but some of things I heard from my informal talk with one of the leaders that they learn while in the workshop include:

A3 Solution which they are expected to give the leader of their various kaizen teams to work together with his team and find a concrete solution to a certain problem area. They can for example work on why there is congestion and que in the morning hours when workers are collecting their posts from the units building. By for example combining PDCA tool together with the 5s lean methodology, they can come up with a concrete decision that the first-line leader will work on and implement. Section 8.5(in the appendices) shows how A3 solution and 5 can be combined to get workplace organization).

Gemba walk- While in the workshop, the leaders are taught and practically shown how Gemba walk works. The group of leaders are for example taken to another district where lean mini-transformation has already been completed. First, they are orientated how things were before lean was introduced at that station they are visiting and then shown around by the navigators' team and the local leader. They call this gathering at one station (Samling på et stasjon in Norwegian). While at that station they also see how the local leader at ``gathering station`` uses Gemba walk technique to see, document and set standards. For instance, In Norway Post especially in post distribution, part of the Gemba walk encompasses a local unit leader creating a schedule list of the permanent workers and then accompanying each one of them in their routes while doing their daily routines of delivering post. From what I gather, the primary purpose is neither surveillance nor micromanaging the workers but to learn and understand how they work. The leaders may ask questions in leans 5 Why style to find the root cause of certain problems so that solutions maybe found. To put this into more perspective, the leaders usually go with a standard checklist noting for example all the thing the postman does before going to the route, while being in the route and after the route is finished. For example, in the case of before the route routines, the leader observes and notes how long he/she takes to collect their post cars, wagons, motor cycles etc, time taken to load the post cars etc. Similar things are done while the two are out in the route and after the route up until the worker finishes his day and signs out and leaves for home. The main aim is usually to find out wastages and then creating waste-free standards. After accompanying many workers, the leader might understand why all the groups, some few or a specific worker usually uses a lot of time in his/her route something that leads to overtime use for Posten. For instance, the leader might want to find out if the overtime problem has something to do with route itself or the workers way of working. In this sense, questions like is the travel distance to and from the route too long, is the route too large etc arise. When it comes to worker the leader might want to find out, if he/takes long time to load the post on his/car and if yes, why? Does the worker take longer break time than stipulated, does he/she give extra service to customers that are not mandated to etc.? After gathering information from many routes, the leader might optimize(adjust) the routes if the overtime problems emanate from the routes or help the worker/workers how work more efficiently by showing them things they can do differently that will help them to be more efficient. Usually standards are tested and then

set for everyone to use after all routes have been mapped by the leader. The standards are also reviewed periodically, and changes made using the same Gemba techniques. The Walk checklist is not limited to only finding wastages, it may be adjusted to cover other areas that is important for Norway post in improving total quality and its image like for instance, how is workers customer relation is, does the work have proper post uniform etc, does he/she respect the traffic rules etc. The Gemba walk list might be detailed or simple. In section 8.6(appendices) there are two examples of forms used during Gemba walk.

Other methods the leaders learn while in the workshops include the 5s, 5whys, VSM, DMAIC, Continuous improvements, kaizen boards, standardization etc. The training and coaching also continuous in their various workstations during the 13 weeks mini-transformation. From what I gathered, the navigators observe the leader's leadership style during the 13 weeks period and then feedback given on areas that they need to improve to make it more lean-friendly leadership like empowering workers to come with solutions, not using a lot of time to managing crisis but preventing the crisis from happening in the first place etc. Workshops to gain more knowledge and share experience are usually carried out periodically.

Employee training on lean system usually takes place in the 13 weeks period. From authors experience in his own distribution unit, the first day was about lean introduction with explanations about the essence of the project being discussed, how it works, how long the lean team will be in that workstation etc. From day two and the rest of the period involved navigators accompanying each worker one day or more and helping them how to find wastages while doing their work. The navigators have stopwatch or clocks for that matter they use to check the tempo of the workers while doing their tasks. They record almost everything a worker does from coming to work until he/she calls it a day. Before the day is finished they discuss with the worker on their findings and advices given on how one self can find out wastages and then do things differently based on mistakes found etc. After the 13 weeks are over, it is usually the first leaders who expected to coach and inspire the workers to continue with the continuous improvement activities.

4.7.6 Framework for realizing positive effects from lean

To reap tangible benefits from lean, the company worked on a plan on how to identify which cost generating areas to be given special and identify wastes in these areas using the lean techniques like VSM, PDCA and DMAIC etc, then to ensure that plans for eliminating wastes are followed up, a documentation was done as a prove that the improvement plans were executed as planned and lastly a method on how measure the effects (Posten, 2015).

In a nutshell, to realize the effects of the continuous improvement projects, the company identified four elements which must be in place for this to happen(Posten, 2015). The four elements are (Posten, 2015):

- Mapping out current state maps of cost driving areas
- Plans on how documentation that will show improvements were executed as planned should be put in place
- A method on how the effects should be measured should be put in place

4.7.7 How the effects are measured

According to Norway post, their lean system is `` built on the principle that it should help the company improve productivity by identifying areas that that can be improved which can`t be identified in the normal management system``(Posten, 2015).

The effects of the mini-transformations are usually measured in terms of increased productivity. The effects are usually measured in the economic section of the company but it is the duty of the grassroot workers and their leaders supported by whole leadership system that the effects are realised(Posten, 2015). To increase productivity for instance during mini-transformation, the lean navigators measure the volume of post coming to the distribution centres and the time taken to deliver post on each route. Using PDCA wheel, they map out wastes in the system and then help set in the idyll future system which

become the new standard. If the new standards aren't working or employees don't buy into the new standards, then changes are made until acceptable `` leaner`` working standard is set in place. From there on the continuous improvement continuous in the centres using PDCA and other lean techniques continuously to achieve perfection. From personal experience, the volume to time measure has helped reduce the number of routes and workers something helps posten increase its yearly performance figures.

Posten usually does yearly customer surveys to check on their satisfaction with the post services. In addition, the communication wing of the company is alert and follows on the news and things said about the company in the news and other places like social media. This helps posten to align their customer orientation strategy. Posten is fully present in the online social world like Facebook, twitter etc where they directly interact with the customers and answer questions that they may have. If the survey results show an improvement trend, then that gives of indication that the customers are satisfied with the quality of their services.

Running efficiency programs when there is volume fall of letters that threaten employees' jobs isn't easy. In most cases using lean to increase efficiency means reducing takt time which in term may mean the number of workforce being reduced. As such running lean during these times must have extra dimension with employees' welfare being put into consideration. Posten does yearly employee surveys to check on how satisfied they are with their working in the company. Improvement in employee barometer surveys is an indication that they are satisfied. If not, things must be changed to improve their welfare. Posten heavily invests in employees' welfare by closely working with employee representatives at work stations and workers unions.

4.7.8 Transparency driven results

As mentioned in the earlier sub-heading, the effects are realized at the grassroots and results measures in the economic circles of the company which directly report to the executive leadership apparatus headed by the postmaster general. That means the first-line leaders role in realizing the effects is very crucial. If the first-line leader isn't motivated, the

whole project might come to naught and the whole after sought improvement culture spread to the four winds. The leadership system up until the top most executive members must also support the first-line leader in their endeavour to make the project work.

Effects of lean are yearly reported from the grassroots up until the postmaster general office. While reporting, transparency and facts are very crucial.

Some of the positive effects lean has helped posten across the years include:

- Reduced the number of post terminals from 10 to just 3
- Saved approximately NOK 5 billion as result of lean measures (source: Lean navigator- see interview med navigator under section 5.1
- Reduced the number of post offices from over 1200 to less than 30 in the whole country (source: District 2 boss)
- Automatization of letter sorting system-increased quality and reduced costs
- Optimization of routes-reduced workforce
- Invested in digital post boxes-diversification of core business etc.
- Reduced sick leave
- Improved customer satisfaction

5 PRESENTATIONS OF THE FINDINGS AND DISCUSSION

In this chapter, the results of the study will be presented. I will first start with the presentation of the interview results from the resource persons, followed by results from the questionnaire survey and discussion of the findings. Thereafter in chapter 6, I will make conclusions based on the findings, limitations of the research and proposal for future research.

5.1: Key Resource person interview results

Before the survey was carried out, key resource persons were interviewed to get an updated picture of lean implementation status in the distribution units that took part in the study as well as the whole company. The key resource persons included: The district manager (in charge of all units in the study), a lean navigator(consultant) and frontline leaders.

5.1.1 Leadership rotation in the distribution network

From researcher's personal experience and what leaders told me, leaders are usually rotated within 5 to every 7 years. Though not part of the interview, when asked the reason for periodic rotation, none of the leaders was interested in answering that question. There is ground to believe that periodic leadership rotation is a common practice in all branches of the organization. In district 2 case, the rotation is usually done within the same district and almost the same time for all the units under the district. The last rotation was October 2017. That means they all have been in their current workstations for nearly 7 months when these interviews were carried out in late April 2018. The upshot of this is that they may not be fully responsible for the status of lean in their current workstations.

Despite being new in their current workstations, it is expected that they have good knowledge of what was done before them in addition to what they did themselves in the short period of their stay.

5.1.2 Results from tele conversation with district 2 manager

Part of the original plan was to interview the district 2 manager but was later dropped because of time constraints on my part. But after studying the company`s structure in previous annual reports, I found out that the structure kept on changing frequently. Considering this, I thought he was best placed to furnish me with an up to date structure of the company and the mail division. So, I contacted him to ask about the current structure of Norway Post. I also used the opportunity to ask him about the effects of lean and how they measure the benefits of the lean.

When asked about the effects of lean, he pointed out the case of periodic route optimizations, where workers are more involved in the process now than was the standard practice before.

When asked about how the effects are measured, he put it this way `` ***In an era of sustained volume reduction, it is hard to know whether what we see is because of lean or as results of post volume reduction*** ``. On one Friday, nearly three weeks after the telephone conversation, we met at my workstation and he pointed to me that `` look the volume of the post is quite small today and workers will probably finish their work one hour earlier today. Can we say this is efficiency resulted by lean or just reduction of the post volume? ``

Results from tele conversation with lean navigator

Sometime late April, I called one of the navigators (name withheld because of anonymity guarantee in this research) to ask him whether he was willing to be interviewed on lean and if yes, to book a date for a possible interview date. When I called him, he was indeed busy with some Norway post`s project in other parts of the country and the possibility of having an interview before summer seemed bleak. He, however, decided to talk about his general experience with lean implementation in the mail division around the country and not specifically about the units in the study. For about 10 minutes, he talked freely without disruptions about the implementation process, some of the main tools and techniques used, how wastes are identified in distribution centres, how standards are set and how to overcome problems with standards, some of the biggest challenges that is hindering the success of the lean project and how much Norway post has saved so far in monetary terms

because of lean. Some of his explanations were used while I was describing the implementation process o in section 4.7.4. Below is a summary of a few selected important findings from his monologue.

One important aspect he mentioned was the importance of adjusting lean in relation to the continued mail volume fall. He said it was still possible to reduce waste and increase efficiency despite the volume fall. He however, didn't elaborate more on how lean can be adjusted in a situation where mail volume kept on going down. If a research of a similar nature is done at a future date on the same company, it could be interesting to ask how lean can be adjusted to volume fall.

He also talked about the biggest challenges that faced lean implementation based on his experience in implementing lean in various distribution workstations across the country. He said some of the challenges were workers not being interested in lean, but he said this was possible to somehow remedy if not at all. He gave an example of a standard setting using the lean techniques and some workers not wanting to change the way they work. He said, in such scenario if especially there are many resisting, it was important to see `` the new standard`` as the problem and not the workers. From there, make new standards in collaboration with the workers until absolute majority think the new standard is good. But he said the biggest challenge was frontline leaders. He said `` some leaders just don't like lean``. Hobbs (2011, p. 14) says that ``lean project can be negatively impacted by a team manager who lacks commitment to the transformation strategy``. This underscores how important the leadership commitment is to the success of the lean project.

Overall, he pointed out that the lean project has been a success since it has helped the company save more than NOK 5 billion since its inception in 2008.

5.1.4 Interview with frontline leaders

The interview questions were structured to ensure all topics were covered but during the interview, the respondents could bundle together one or two more questions while answering the questions. Results are presented in topics rather than answers to each question. Before the interview results are presented, it could be interesting to see table.8 below which shows an overview of frontline leaders that I talked to and how we interacted.

Table 8: Showing FRONT-LINE LEADERS IN DISTRICT 2 TAKING PART IN INTERVIEW.

Distribution unit leader	Unit in charge	In the current unit since	Interaction form	Transferred from
1	1	Oct.2017	Interview	Non-participating unit
2	2	Oct. 2017	Interview	3
3	3	Oct.2007	Tour of workstation	2
4	4 & 5	Oct. 2017	Interview	New in unit 4(extra mandate since oct.2017)

The essence of going lean

I expected leaders to know why the company is going lean but the reason for asking them was to see if they have personal views which of course can affect the way the progress of the lean project in their areas. Their answers were unanimous. They all mentioned the triple effects Norway Post has mentioned when they first launched the project in 2008 namely increase productivity, improve total quality (for customers) and improve workers morale.

Length of implementation, implementation and workers reaction then and now

They all belong to district 2 and therefore mentioned the first quarter of 2017 as the when lean project came to their stations (Between February to March 2017 depending on the unit). For the sake of this study, we assume the slight difference in when lean came to them to be minimal to have a significant effect on how long the units have come with their projects. Their description of implementation was also similar. This was expected since the lean team probably used the same guidelines while implementing. Their description of workers first reaction seems similar with some thinking it is interesting while others being a sceptic. However, when it reactions of workers today, there responses varied slightly. For instance:

Leader 1. ``*In this unit, people are used to doing things as they like especially those who have worked in the post for a long time. The previous leader let them do things as they wished. I am trying to change*

things by first explaining why we need to things differently. It isn't easy though but will keep explaining why``

Leader 2: ``They are some few who still don`t like new things but majority think it good and working but that came through a systematic collect effort``.

Leader 4: ``Some workers just don't like changing of standards. Those who think they are doing things correctly and are efficient don't see the reason why they should change what is working for them``.

While showing me around the unit, unit 3 leader who wasn't interviewed said that there is no much lean activity in his unit but that there was much lean activity before him. He showed me some of the things the previous leader has done like the alignment of things in their hall to increase better flow like all operations with commonalities are grouped together in one cell, everything has a fixed place for instance parking for cars, keys and other materials used daily. He indicated that he personally doesn't like lean and so do many of his workers

Strategies used to motivate workers and increase participation

From the interview, it is clear that only leader for unit 2 has a proper well thought strategies. She, for example, mentioned formation of lean teams, kaizen boards , Kahoot programmes, recognition of the most efficient work with least number of customer complaints from his/route, playing lean games and learning from the winner and making standards from the best practice. Leader 1 said she used to use kaizen boards in her previous unit but no lean strategy for the current unit so far but that the most important for her is to make them understand why in everything they try to do. Leader 3 said he tries to involve more workers especially when it concerns organizing things in their building and when adjusting routes.

Lean tools and techniques awareness and the most effective tools and techniques

They had several lean workshops and they could easily recognize the lean tools in the survey but when it comes to using them daily and the most effective ones, the answers seem to be similar despite the degree of use seems to be varying. 5s, standardization, continuous improvement(Kaizen) are the most used and effective ones in their context. Only leader for unit two has indicated of using Kaizen boards all the time. One has indicated of using it despite remotely while the one said of using it in her earlier workstation. They were also coached and know how to use tools like A3 solution but none of them mentioned of using practically in their workstations.

Effects of lean, measuring effects and presentation of results

They all mentioned layout in their facility being better than before and things being more orderly than before. They all mentioned for things being in permanent places and located near to near where they are needed. They all said this has helped reduce the irritation moments among all workers and reduced time used for looking for things. Interesting finding though was that leader for unit one who mentioned inheriting a group who used to things as they wished mentioned many effects that can be traced to lean. She, for example, mentioned reducing overproduction of adverts papers by encouraging workers to continually manually update the digital route book whenever customers label their mailboxes no adverts please sign. The digital route book communicates systematically with adverts production machines and therefore only the needed number of adverts are sent to her unit. In other words, no oversupply of adverts. She said, only in her short stay she reduced the number to be recycled adverts waste container from 3 to just one something also freed up a lot of space in their small building. She also mentioned putting all types of keys under one locker to reduce the time used in collecting and returning all the various keys. She also mentioned among other things putting more emphasis on preventing damages to transport materials, safety and using more the digital route book to give customers the best they deserve and reduce the number of complaints. This gives a picture of lean probably being implemented but without necessarily involving workers in finding in finding solutions. When it comes to presenting the results to workers, only leader for unit 2 mentioned using morning floor meetings and kaizen board to visually show the workers what they intended to achieve then and how the situation is now.

Their capacity to continue with the project and support from the organization

They all mentioned having got sufficient knowledge about lean. They pointed to their various lean workshops and lean benchmarking tours especially in the 13 mini-transformation weeks. Moreover, they all indicated of having been a leader for a long time, with the lowest experienced leader being at the helm for at least 7 years and are in such well experienced in implementing both small and big transformations. An earlier research in Norway post`s front leaders` role in transformations has found similar finding on the leaders` experiences(Haraldsen & Haraldseid, 2014). They didn't mention not getting the

support they need from the organization to carry out lean properly in their areas. However, one of the leaders mentioned that she wasn't satisfied with the follow up from the district boss to encourage them to do more lean activities. She put it in this way:

``Even though the district boss periodically individually asks us how the lean project is going but he never makes it as part of the agenda during leaders' gatherings``

Various studies show that for lean to work, all the leaders beginning from the topmost to the shop floor leader must buy in into an idea and accept it as a force for bringing positive changes. Further, first-line leaders just like their subordinates especially those who did things correct need to be recognized for their effort by their seniors to encourage to continue doing things even better. From that statement, it is evident that something out to be changed.

Balancing leadership and management

The reason I asked this question was that various studies show one of the reasons lean culture doesn't anchor in organizations is because of leadership not changing first the way they do things for lean to be successful. In this regard, I gave them the opportunity to self-evaluate on whether they have become a lean leader. One of the leaders seems to be indifferent and puts more emphasis on getting the job done. The other one said she used to a micro-manager before lean but has somehow changed off late and gives workers more benefit of doubt in doing their job correctly as expected. The other one said he involves more the workers in decision making in some areas than before, but he couldn't say anything more than that.

Evaluation of the project, satisfaction and sustainability

All the leaders said that no systematic evaluation of the project has been done beyond the 13 weeks light version transformation. Only leader for unit 2 said she evaluates her own work but no external evaluation takes place. She said she periodically contacts one of lean navigators if she needs clarification on certain things. Only leader for unit 2 was totally satisfied with lean while the other two put it this way.

Leader 1: lean concept is okay, but I am not going to carry out any kaizen board and the like here. Lean finished during the mini-transformation, but our work is to involve the workers when things are right. We always strived to improve things continually, we will continue with that whether it is called lean or not.

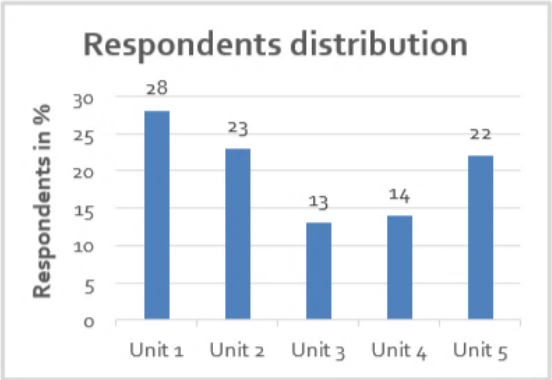
Leader 4: Lean is an extra management tool that reminds us to involve workers more. We need to understand the lean principles and consider them in the way we do things but doing everything according to lean, I don't think so.

When asked about whether lean should continue, they were all in no doubt and answered in the affirmative.

5.2 Results from the survey

5.2.1 Response rate

The original plan was to have at least 100 respondents. So, in consultation with my project contact (my unit leader and local employee representative), we found out that 5 of the 8 district 2 distributions units could give us that figure. All the five units had together 112 permanent workers and some extra temporary workers, but only permanent ones were to respond to the survey and strict information was given to the leaders distributing the questionnaires. Totally, 78 workers had responded to the survey which makes approximately 70%. The response rate seems quite acceptable based on similar paper surveys carried out in earlier research(Lid & Kristoffersen, 2013; Støle & Ekeren, 2015). Figure 15 below, shows an overview of how many responses the survey got from the various units.



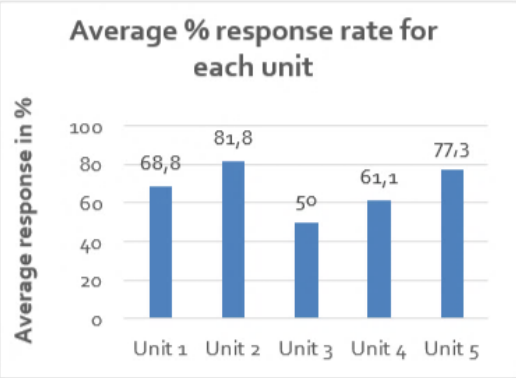


Figure 14: Figure on the left shows respondents distribution while figure on the right shows average response rate for each unit

From the figure on the left we observe that unit 1 produced the highest number of respondents (28% of overall respondents) while unit 3 produced the lowest (13%). Even though unit 1 had the highest number of respondents as shown on figure on the left, figure on the right shows that they have been displaced to third position and overtaken by unit 2 (81.8%) and unit 5 (77.3%) when average response scores per unit was done that factored in the unit total population. For unit 3 and unit 4, their positioning remains the same independent of which method is used. Next, we will see the employees background: The length of their employment in Posten and their education level.

5.2.2. Length of employment in Norway post

From researcher's personal experience, majority of the post workers have been working in the company for a long time, therefore, they were asked to give their length of stay in range to particularly protect the anonymity of the new ones who were expected to be minority. Also, gender was excluded since I know most of the workers are male (Approx. more than 90% are expected to be male based on my observation in all the unit I observed) for the same reason stated above.

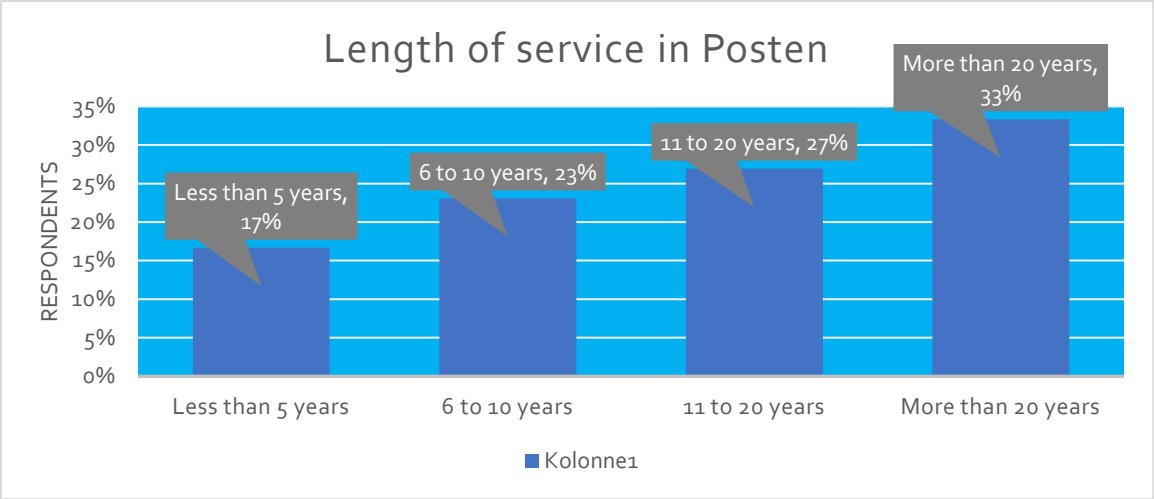


FIGURE 15: SHOWING RESPONDENTS LENGTH OF SERVICE IN THE COMPANY

From the result in figure 15 we see one in three postmen (33%) have worked more than 20 years in distributing post. More than 60% percent of the total workforce in the units investigated have worked for more than 10 years. During the interviews, one of the leaders complained of workers not wanting to adopt new standards and another leader complained of workers with long service not being interested in lean. In a future study, it could be interesting to investigate this. Next, is the educational level of the respondents.

5.2.3. Educational level

Just like for the same reason in length of employment, respondents were asked to state their educational level in range.

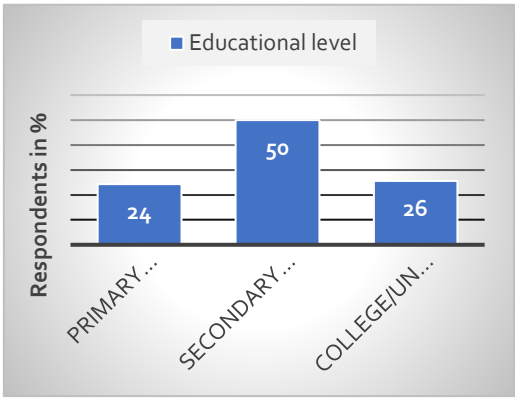


FIGURE 16. DISTRIBUTION OF RESPONDENTS' EDUCATION

From the figure 16 on the left, we see that 50% of the workforce in District 2 have secondary education. Those with primary or college education or high seems to be almost equal with 24 % reporting to only having primary education and 26% higher education. Next was to assess employees' awareness of ongoing lean of ongoing lean in their workstation.

5.2.4. Awareness of ongoing lean activity

Respondents were asked whether they were aware of ongoing lean activities in their workstations. The reason for asking this question was that, an earlier lean research conducted in Poland(Malinowska & Szymańska-Brałkowska, 2015) showed not all employees were aware of ongoing lean activity in their place of work (85% were aware according to that study). In this study, only 3 out of the 78 respondents said they weren't aware of ongoing lean in their workstations. Alternatively said, that means 96% were aware of such activities ongoing. The explanation for these high number is probably because the lean mini-transformation was in their units nearly just one year before the survey papers were distributed. Going forward, input from those respondents who indicated of not being aware of ongoing lean activity in their workstations, will be excluded from the rest of the analysis on the basis that the rest of their responses beyond this point is presumed to be guess work[6]

5.2.5. Level of lean activities in the various units

FIGURE 17: SHOWING HOW OFTEN LEAN IS

As part of quality enhancement drive, all first line leaders are expected to hold quality briefings in their units at least once in a week or more if need arises. In these meetings employees are informed on areas that need improvement based on things that were reported by employees themselves, complaints by customers or circulars from the post directors that

[6] Guess work here means their responses is not based on their experience with lean.

they want employees informed. These are usually ca. 30 minutes meetings that are held in the floor of the building. To check whether lean was part of the agenda in these meetings, respondents were asked on whether lean is discussed often or rarely in

their meetings.

From figure 17 above, we see that only 29 % of total respondents for all units reported lean being of their meetings agenda while the rest 71% reported lean being rarely part of the agenda. Table 9 below shows that lean is mostly part of the agenda in unit 2(78%).The rest of the units reported less than 20% with the lowest lean activity being reported in unit (10%).

TABLE 9: SHOWING HOW OFTEN LEAN IS PART OF THE AGENDA IN EVERY UNIT (N=75)

Distribution Units	Average % for each unit reporting lean is often part of agenda
1	18
2	78
3	10
4	13
5	12

5.2.6. Purpose of the lean project

One of the reason of lean failures has been associated with failure to connect continuous improvement activity with organizations overall strategy of going lean (Hobbs, 2011). A study in Poland found out nearly 16 % of respondents associate lean with downsizing(Malinowska & Szymańska-Brałkowska, 2015, p 79). To check on whether respondents understood on why their company is implementing lean, respondents were asked what they thought was the essence of having lean in their organization.

Table 10: SHOWING RESPONDENTS DISTRIBUTION ON WHAT THEY MEAN IS THE ESSENCE OF THE LEAN PROJECT (N=75)

	Frequency	Mean
Improve economy	54	0.74
Better service for customers	47	0.54
Better work environment for workers	41	0.46
Downsizing	23	0.30
Don't know	3	0.05

Results in table 10 above shows that economy has been selected by the most as the purpose of having lean in Norway Post (74% of respondents). It is followed by improve the quality of service to customers and better working environment. The least selected reason for having lean in the company is downsizing the workforce. A total of 23 respondents selected workforce reduction as the reason for having lean which translates to 30% of the respondents. This is a huge number. However, when 30% score for downsizing the workforce was compared to the aggregate score for all the choices in the question, I have found out that 14% of all the respondents who answered the question on the purpose of the project selected downsizing only as the reason for implementing lean in the company[7]. Next is assessment of employees lean tools awareness. But first, we define what lean awareness means?

What is lean awareness?

The Cambridge online English dictionary available at https://dictionary.cambridge.org/dictionary/english/awareness , defines awareness as ``knowledge that something exists , or understanding of a situation or subject at the present time based on information or experience``. The online business dictionary available at http://www.businessdictionary.com/definition/awareness.html defines it in business terms ``In marketing, measure of how well known a brand, firm, or product is. Companies usually set a target for the degree of awareness they intend to achieve, and then plan a promotional campaign to reach that target``

Using the Cambridge definition as a reference point, we can as such define lean awareness as `` knowledge or recognition of existence of lean activities, essence of lean project, tools and techniques used, waste areas and lean effects based on their experience with lean``

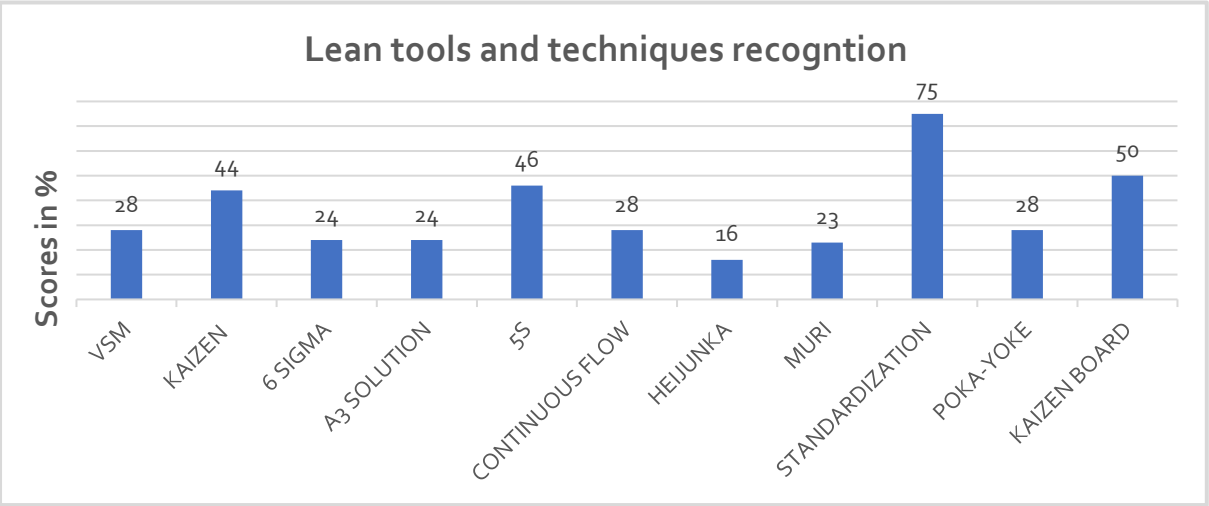
From there, we can use the business dictionary definition as a reference point to define what is level of lean awareness? Level of lean awareness can be understood to mean `` a measure of how well the purpose of the project is known, tools and techniques can be recognized, wastes and lean effects can be recognized``

[7] The question testing purpose of the project had 5 multiple choices with possibility of choosing more than one answer. That will mean, for instance, those who selected downsizing the workforce (23 respondents) as the reason for having lean might have also selected other choices like economy, improve working environment etc.

5.2.7. Awareness of lean tools

Before the survey was distributed leaders have during interviews confirmed of being taught about the tools in the survey in their lean workshops, so we wanted to check whether this translated to knowledge transfer to their workers. In this regard employees were asked to state yes or no on whether they knew the lean tools in the survey. In the analysis percentage of each tool recognition relative to the rest of the tools is given in brackets.

FIGURE 18. RECOGNITION OF LEAN TOOLS AND TECHNIQUES



The result reveal that standardization is the most recognized tool with 75% followed by continuous improvement (kaizen) (50%) and 5s (46%). The least known tools are Muri (23%) and Heijunka (16%) respectively. The average score for all the tools based on the summation of individual averages divided by number of tools tested is 32.6%. Considering the scoring system in this thesis, a 32 % average is an indication of low degree of awareness. Next, we will compare the degree of recognition of the most used tools mentioned by the leaders

Comparing degree of vital tools awareness by units

Table 11: Interunit comparison in tools & techniques recognition

Units	Kaizen		5s		Standardization		Kaizen-board		Average Yes
	%		%		%		%	%	
	Yes	No	Yes	No	Yes	No	Yes	No	
1	56	44	24	76	82	16	17	83	45
2	60	40	65	35	78	22	94	6	74
3	34	66	40	60	44	56	48	52	42
4	30	70	48	52	86	14	36	64	53
5	40	60	53	47	85	15	55	45	58
Average % yes	44		46		75		50		54

Results from table 11 above show that most respondents have an acceptable awareness of these 4 core lean elements mentioned by their leaders scoring an average of 54% for all these elements. However, the pooled standard deviation for all of them is more than 10% which makes us believe that the real average is probably even much lower. When it comes to individual units, unit 2 scores the best for all tools scoring an average yes of 74%[8] for all the tools while unit 3 scored the lowest with an average of 42% of respondents from there recognizing the four elements. When it comes to individual elements, standardization is the most recognized with 75% of all respondents saying yes. The lowest recognized tool is Kaizen Board with only 46% indicating to know it. Next is analysis of areas that are perceived to have improved because of lean.

5.2.7. Perceived areas to be improved with lean (perceived wastes)

The lean principle is based on elimination on 7 plus one (untapped knowledge) deadly wastes. In this question, respondents were asked on a Likert scale of 1 to 5 (disagree to agree) which areas they perceived to be improved with lean in their own context. The basis for the selection of areas to be improved was talk with the unit leaders and the lean navigator. To check on the extent on which respondents think some areas to be given more

[8] On average 74% of respondents could recognize the four tools while the rest couldn`t

attention than others, a sum of the partly agree and agree was done and results displayed on table 12.

Table 12: Perceived areas to be improved with lean (N=75)				
	Frequency	**Partly agree (%)**	**Agree (%)**	**Sum partly agree and agree (%)**
Building-Layout	62	24.3	45.7	70
Movement	64	32.7	41.3	74
Overproduction	68	37.3	50.7	88
Waiting	62	20.6	32	52.6
Capacity/volume balance	57	24	33.3	57.3
Overtime use	70	28.4	36	64.4
Defects	64	30.3	28	58.3
Sickness	72	20	12.7	32.7
Poorly organized routes	67	16.3	34.4	50.7
Rework	67	38.7	25.3	64
Service complaints	70	10.7	10.6	21.3
Untapped knowledge	48	10.7	22.7	33.4
Loading time	68	33.3	25.3	58.6
Information flow	68	18.7	28	46.7

Looking at individual results presented in the table 12 above, we see that overproduction(commercials) is perceived as the most critical area that can probably benefit from lean with 88% of those who answered that question either agreeing or somewhat agreeing. It is followed by unnecessary movement (74%) and layout problems in their facility (70%). Customer complaints and sickness problem seem to be the least cumbersome for the respondents scoring 21.3% and 32.7% respectively. The low results for customer complaints and sickness seems a vindication of what Norway post has been claiming in their yearly reports which constantly shown improving figures for customer satisfaction and absenteeism related to employees sickness since the Spinnaker project

which lean is part of was initiated in 2008(Posten, 2016b). Next on the analyse table is lean effects.

5.2.8. Lean effects

Related to previous question on potential areas that can be improved with lean techniques, respondents were asked in a scale of 1 to 5 (disagree to agree), which areas they think have improved because of lean implementation. The answers for the partly agree and disagree was summed up and analysis based on this done as presented on figure 19.

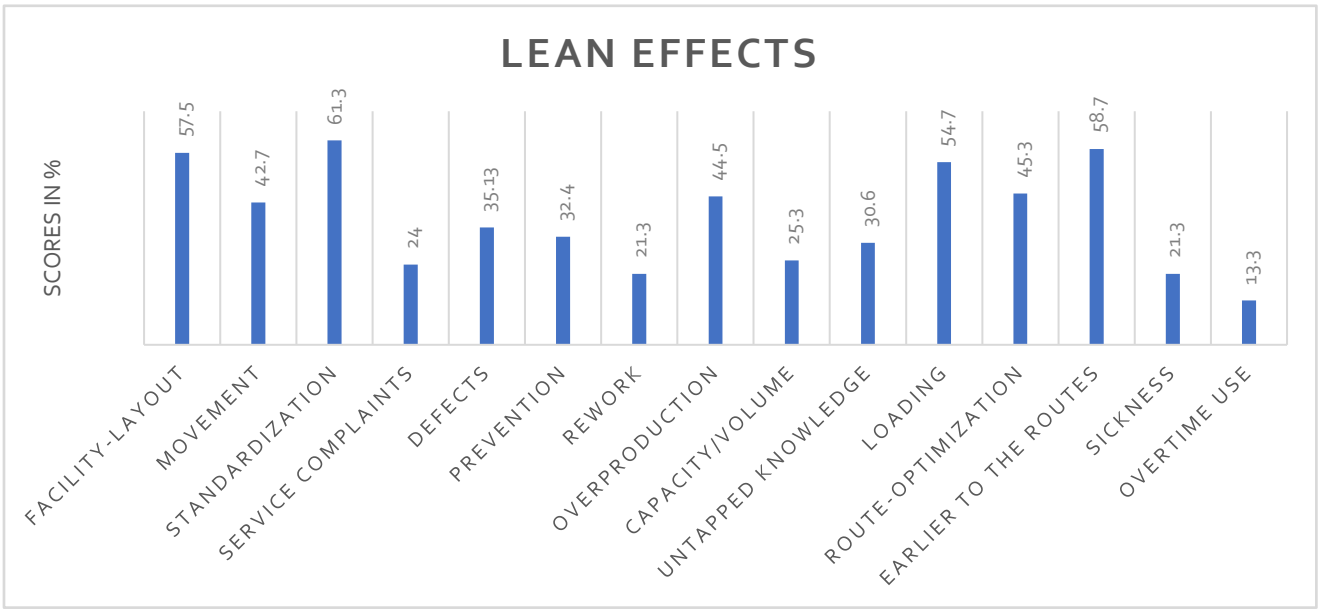


FIGURE 19: PERCEIVED EFFECTS OF LEAN.

From figure 19 above, we observe that standardization(standard work)(Salem et al., 2016) is seen as something has improved most as a result of lean (61.3%) followed by going to the routes earlier (58%) and facility layout(57.5%). These results aren't surprising because during the lean project, these were areas that given the most focus.

Sickness (21.3%) and overtime use (13.3%) have got the lowest scores. It is important to point out that employees are probably not best placed to answer questions pertaining sickness or overtime etc. The reason is that employees are not expected to have access to

data showing statistics on sickness and overtime unlike their leaders. An earlier study on lean effects in a production company in Norway has had the same observation after finding low scores for sickness(Lid & Kristoffersen, 2013)

Other areas that have got low numbers include customer complaints (24%), rework (21.3%) and un utilized skills (30.6%). Next to be analysed is the soft part of lean- employees' perception of lean.

Overall, the perceived effects seem to be lower than the perceived potential of lean contributions. The average difference for the percentage sum of partly agree and agree for the perceived wastes and perceived effects is 19% (55-36).

5.2.9. Hypothesis testing

To make sense of all the noise generated in the findings, hypothesis can be developed(Salem et al., 2016). Two hypotheses were developed in this thesis to make sense of the data.

Hypothesis 1: H1: Norway post employees level of lean awareness is low

Essence of this hypothesis was to test on whether the assumption that Norway post employees lean awareness is high is true. To validate the hypothesis, a one sample two tailed t test at **95 %** confidence interval (**α=0.05**) was run in Minitab. Before the test was done, an assumption that the population in which the sample is drawn is normally distributed was taken. Results from Minitab show that a P value of less than 0.05 (**p=0.000**). Since **p< 0.05,** the null hypothesis is rejected at 95% confidence interval and infer that there is probable evidence to believe that Norway post employees level of lean awareness is low. The outcome of the hypothesis testing seems to be in consistent with the total average awareness score for all the categories that were testing lean awareness (46.7%). As discussed in section 3.8.2, anything above 50% score is recognized as acceptable level of awareness.

Hypothesis 2: H2. There is a difference in the level of lean awareness between different distribution units in district 2.

This hypothesis was linked to research question two which was trying to find out whether one`s level of lean awareness depends on which distribution unit one belongs to. Put differently, whether there are differences in the level of lean awareness between the units. To find this, analysis of variance was carried to check whether the population means of which the samples are drawn are equal. A normal distribution of variances was assumed for this test and a confidence interval of 95% (α **=0.05**) was chosen for testing this hypothesis. Results from Fishers test show that a p value of less than 0.05 (**p= 0,000**) and F value of 29.15 (**F=29.15**).

Conclusion: The high F value and low P value tells us that the populations means are not equal and this is significant at 95% confidence interval. To find where the differences come from, a Tukey post hoc analysis was done in Minitab and results shown below.

Results from Tukey's Post hoc analysis

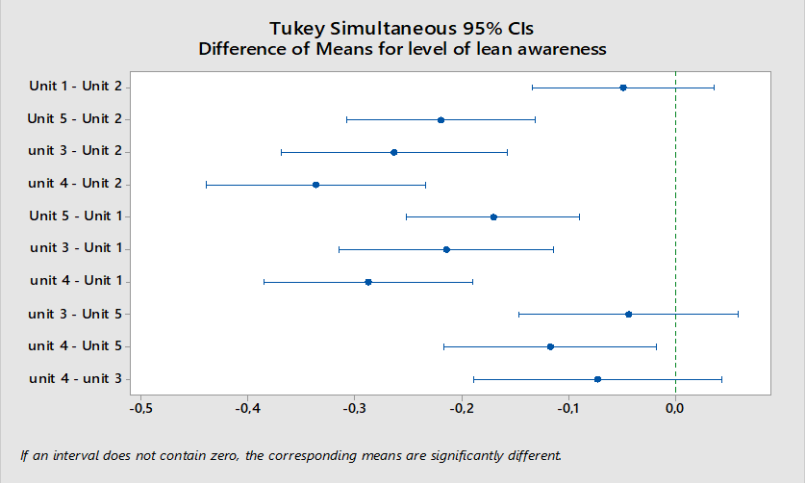
Tukey Pairwise Comparison

Grouping Information Using the Tukey Method and 95% Confidence

Factor	N	Mean	Grouping
Unit 2	17	0,5273	A
Unit 1	23	0,4783	A
Unit 5	20	0,3077	B
unit 3	10	0,2640	B C
unit 4	11	0,1907	C

Means that do not share a letter are significantly different

FIGURE 20: POST HOC ANALYSIS IN MINITAB TO FIND WHERE DIFFERENCES IN MEANS COME FROM



The Post hoc analysis shows that apart from **(unit1-unit 2), (unit 3-unit 5)** and **(Unit 4-unit 3)** which all have intervals containing zeros as shown in Tukey`s comparison(figure 21)

indicating insignificant differences between the means of these pairs at 95% confidence interval, the rest of the pairs have confidence intervals that don't contain zeros meaning there is a significant difference between them at confidence interval 95%. The individual confidence level for each of the pairs as shown in Minitab post hoc analysis is **99.34%** meaning the intervals probably give a correct reflection of the real differences between the pairs. Based on this, we can thus conclude that, there is probable evidence to suggest that there is a difference in the level of lean awareness between some of the distribution units in district 2.

5.2.10. Perception on issues critical to participation

Investing in hearts and minds of workers has been named as a critical issue that differentiates who succeeds and sustains lean and not(Fricke, 2010; Hines et al., 2011). A study on successful lean implementation(Larteb et al., 2015) names ``managerial concepts, people and relations`` as issues that must be addressed to anchor lean in the organizations culture and sustain it. In this section, issues that can affect employees' participation and sustainability of lean will be analysed. Respondents perception on the issues will be categorized into leadership, empowerment and satisfaction.

Leadership

Table 13: Scores for Perceived leadership qualities

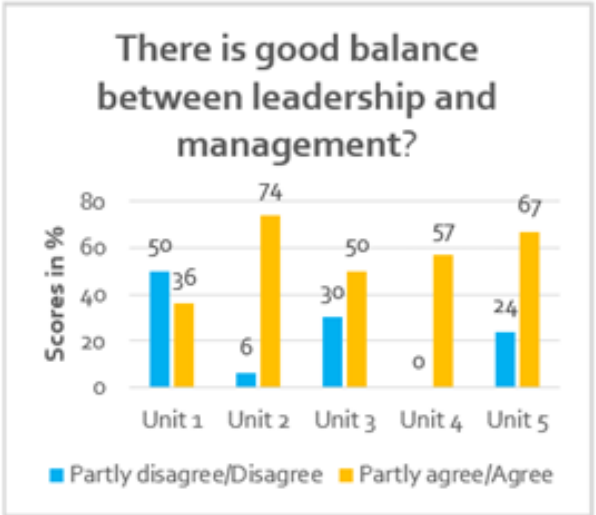
Item	Frequency	Somewhat agree %	Agree %	Sum partly agree and agree %
Leader leads by example	74	13.5	10.8	24.3
There is good balance between leadership and management	74	33.8	23	56.8
Mistakes form basis for learning than repercussions	70	15.7	20	35.7
Leadership values our ideas	75	21.3	28	49.3
Average (%)				**41.5**

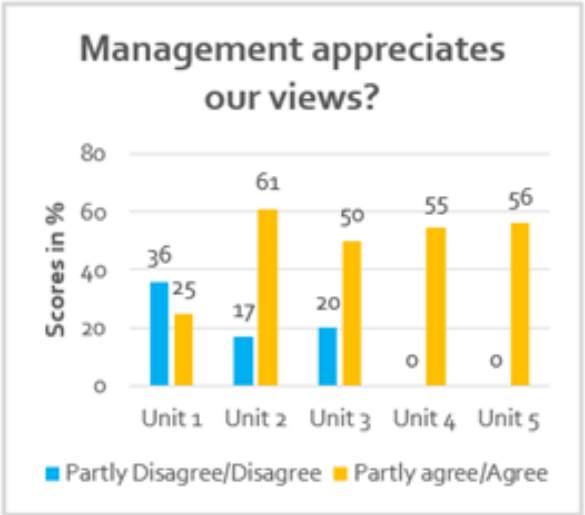
Respondents were asked from a scale of 1 to 5 (disagree to agree) on issues concerning leadership. Their responses on partly agree and agree are summed up and results presented in the table 13.

From table 13 above, we observe that, majority of the respondents are not satisfied with the leadership styles and qualities of their leaders with the average score for all the units on the items tested being below average (41.5%). A characteristic of lean leadership is that the leader leads by example. A paltry 24.3% of the total population of respondents who answered this question think their leaders lead by example. Nearly have of the respondents (49.3%) think their leaders value their ideas. This seems quite poor considering the whole lean foundation is built on ideas from frontline workers that are implemented by their leaders(Womack & Jones, 1997). Only 35.7% of the respondents somewhat agree or agree that mistakes form basis for leaning than punishments. The question on whether there is good balance and leadership not only solicited the highest response rate (74/75 respondents) but also the highest leadership score with 56.8% of respondents saying they somewhat agree or agree that there is good balance between leadership and management. What we don't know however is how much of each (leadership or management) to arrive at that score something probably another future research in this district should investigate. Next, is comparing leadership qualities between units as perceived by respondents.

Inter-unit comparison on perceived leadership styles

FIGURE 21: COMPARING UNITS ON LEADERSHIP FEATURES. GRAPH ON THE LEFT SHOWS ON WHETHER THERE IS GOOD BALANCE BETWEEN LEADERSHIP AND MANAGEMENT. GRAPH ON THE RIGHT SHOWS ON WHETHER RESPONDENTS VIEWS ARE TAKEN INTO CONSIDERATION WHILE MAKING IMPROVEMENT DECISIONS





A characteristic of lean manager is that he/she should be able to balance leadership and management (Hines et al., 2011; SVÄRD, 2016). The interunit results on questions of leadership/management balance and management consideration of workers ideas analysed and results exclusive the neutral part (neither agree nor disagree) presented on two graphs in figure 21 above. Looking at graph on the left, unit 2(74%), unit 5(67%) and unit 4(57%) scores best on the question of management/leadership balance while slightly more than 1/3 (36%) of unit 1 respondents think there is good balance between leadership and management. Respondents from unit 3 seems divided on this issue with exactly half (50%) saying either somewhat agreeing or agreeing that there is good leadership/management balance. Shifting to graph on the right, the same pattern seems repeated albeit slightly less with unit 2(61%), unit 5(56%) and unit 4(55%) scoring the highest respectively. On the lower end, the situation is critical for unit 1 with a meagre 25% thinking their leader appreciates their views. While for unit 3 the situation for graph left seems repeated as half (50%) of the respondents saying they somewhat or agree that leadership values their ideas. Interesting to note that none of the respondents from unit 4 and 5 either disagree or somewhat disagree on this question. As clarified earlier in this paper, these two units have the same leader albeit being new in unit 4 (from October 2017).

Empowerment

Ideas for lean are usually crowdsourced from frontline workers and implemented by their managers(Womack & Jones, 1997). Further, workers must be given autonomy to be creative and try solving everyday problem using their accumulated experience first before they get help from others. They ought to be involved on decision making on issues concerning their work. All this issue have been sighted by various studies to increase employees empowerment and can influence the direction of the lean project (Støle & Ekeren, 2015). Based on these issues, respondents were asked from a Likert scale of 1 to 5(disagree to agree) on whether feel empowered and summed up percentage results for partly agree and disagree presented in figure 22 below

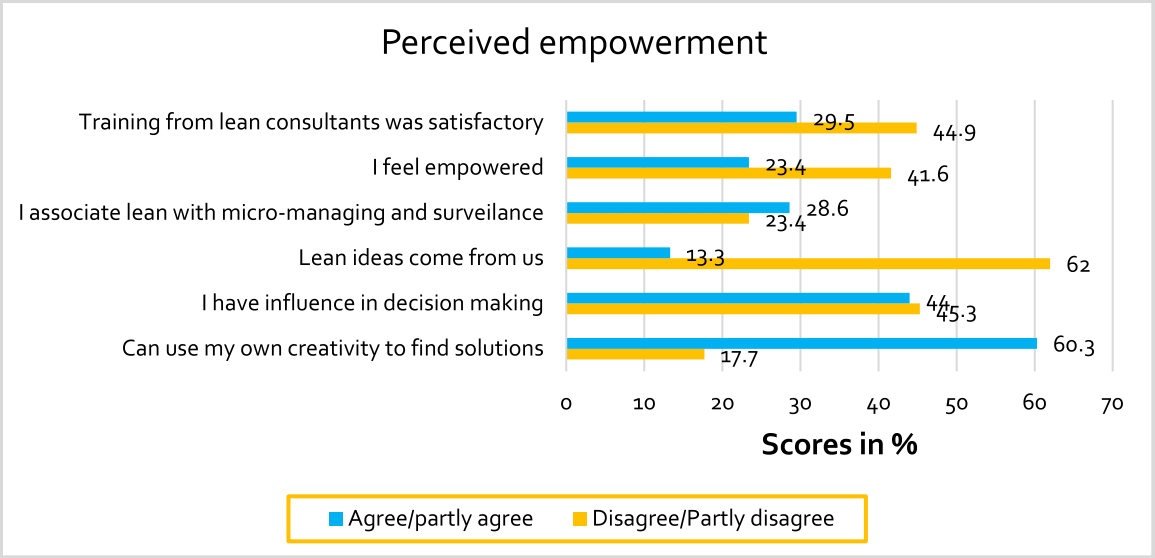
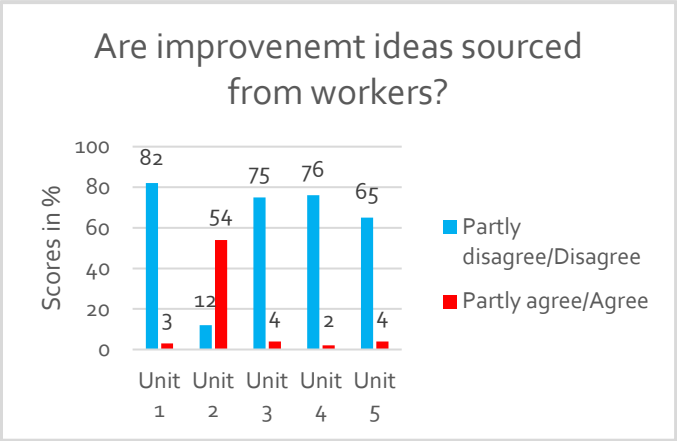


Figure 22. Responses on issues that are critical to participation and involvement

On figure 22 above, it can be observed that a whopping 62% of the respondents from all units somewhat disagree or disagree that improvement ideas are sourced from them. Only 13,3% of total respondents either somewhat agree or agree that improvement ideas are from them. On the opposite end 60.3% of respondents think they can use their creativity with only 17.7% either somewhat disagreeing or disagreeing. From personal experience and looking at respondent profiles as presented on section 5.2.2 (length of service in the company with 8 of every 10 respondents saying they worked more than 6years and above for the company) it is not surprising that many think they can use their creativity. This possibly because of the nature of the job which is repetitive on core operations which if one has accumulated long experience can probably use it when new similar challenges arise. 44% of total respondents indicate to being consulted in decision making while nearly the same number (44,9%) seems not satisfied with lean training from consultant during the 13-weeks lean project period. There was a negatively loaded question that required respondents to indicate on whether they perceive to having increased micro-management and surveillance. A question was raised on this question by one of the leaders after the survey was concluded on the possibility of the question being misunderstood since it is shift from the norm with the rest being all positively loaded. A parenthesis explaining this shift was appropriate but wasn't done. This should have been resolved during the pretesting but the back stops at the researcher. Since no actual respondent(employee) raised a question on this, it was included in the analysis. However, majority of the respondents (48%) seem neutral on this question with the rest being divided on either saying it increased the mentioned problems (28.6%) or not (23.4%). Still related to this question, interunit comparison on questions source of lean ideas and feeling of empowerment will be analysed. The neutral part of the answers will not be displayed in the presentation graphs.

Source of improvement ideas-interunit comparison

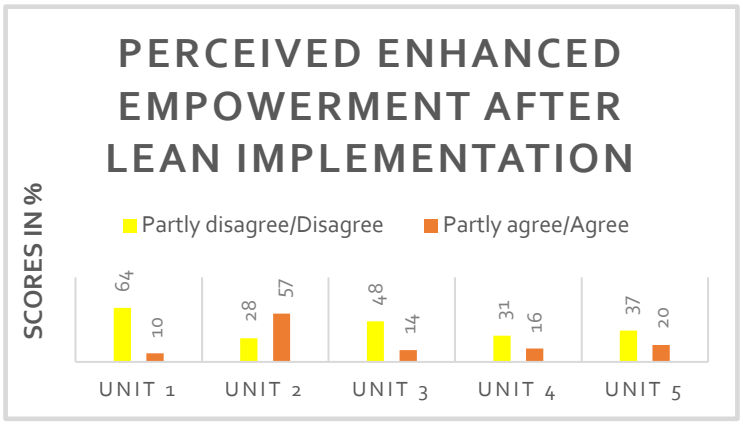
Figure 23: comparing units on how they source



From the figure 23, it can be observed that it is only in unit 2 where workers seem involved in finding improvement ideas with 54% of respondents from there indicating on the affirmative (partly agree or agree). The situation looks bleak for the rest with all scoring below 4% an indication that not many improvement ideas are insourced from workers in these units.

Does lean make workers feel empowered?

Figure24: Comparing units on respondents' perception on feeling empowered

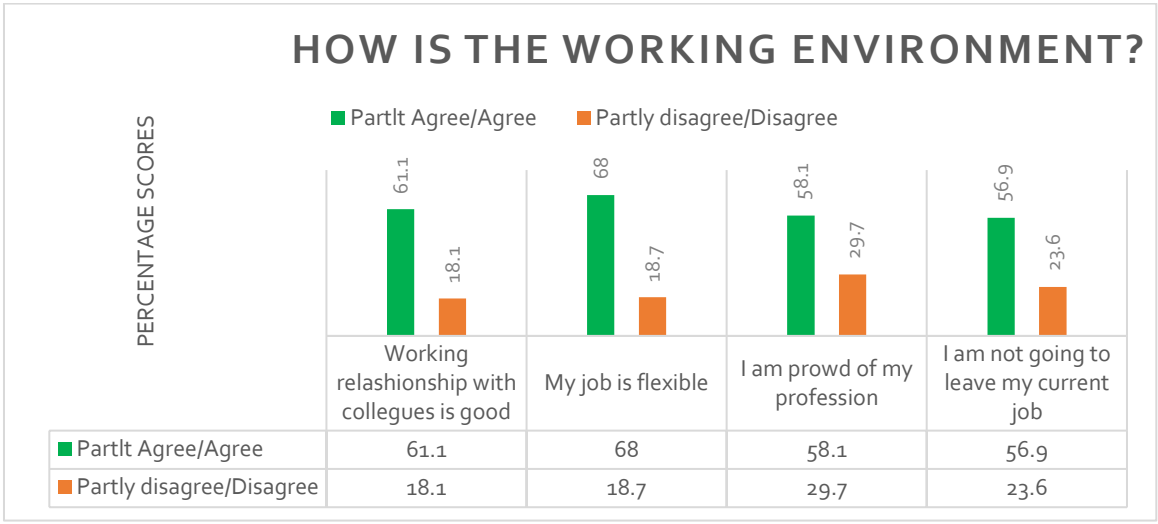


When asked whether they felt more empowered after lean implementation the effects looks different for the different units. On figure 24, we see 57% of respondents from unit 2 feel more empowered (partly agree or agree) while the rest of the units score below average with highest being unit 5(20%) and the lowest unit 1 with only 10% feeling empowered. Comparing results of these two graphs above with results presented on box 1 where interunit comparison on perceived leadership styles was done, it seems there is a probable correlation between the type of leader a unit has and the employee inclusion in the improvement activities although they can be other cause effect which makes a final conclusion on this issue quite hard. Next to analysed is respondents' perception on their working environment.

Satisfaction

lean usually revolves round working in teams to find answers to certain issues put forward by the management or proposed by one of the team members. Members of the team have to feel comfortable enough to work with their colleague's. They have feel respected and appreciated by both colleagues and leadership. According to a previous study on employees lean engagement(Støle & Ekeren, 2015), indicators of employees satisfaction include on whether they are proud of their workplace, report to having flexible jobs and are committed to working there for a long time etc. Respondents were asked to have a take on these issues and findings presented in the figure 25.

Figure 25: Evaluation of the perception of the working environment



From figure 25, we observe that 61.1% of the total respondents who answered question on inter-colleague relationship indicated of having a good relationship with their colleagues (somewhat agree or disagree) against 18.1% who said they either somewhat disagree or disagree with that view. Asked whether they have a flexible job, 68% of those who answered this question somewhat agree or agree while less than 20%(18.7%) said they disagree or somewhat disagree. Approximately 58% of those who answered question on whether they are proud of their profession said on the affirmative (agree/somewhat agree) while approx. 30% indicated they didn't (somewhat disagree/disagree). Finally, when asked on whether they want to continue with their current job, 56.9% of those who answered this question somewhat agree or agree while 23.7% didn't either agree or disagree. Overall, the average satisfaction rate for all respondents based on these sub-category is 61% which is

acceptable based on our scoring system discussed in section 3.8.2. Still in this question, we will analyse whether there is correlation between perceived leadership traits and employees' perception of satisfaction.

A Spearman`s non-parametric correlation test was run in R to check whether there is correlation between the perceived leadership styles and perceived satisfaction. The result is displayed in table 14 below.

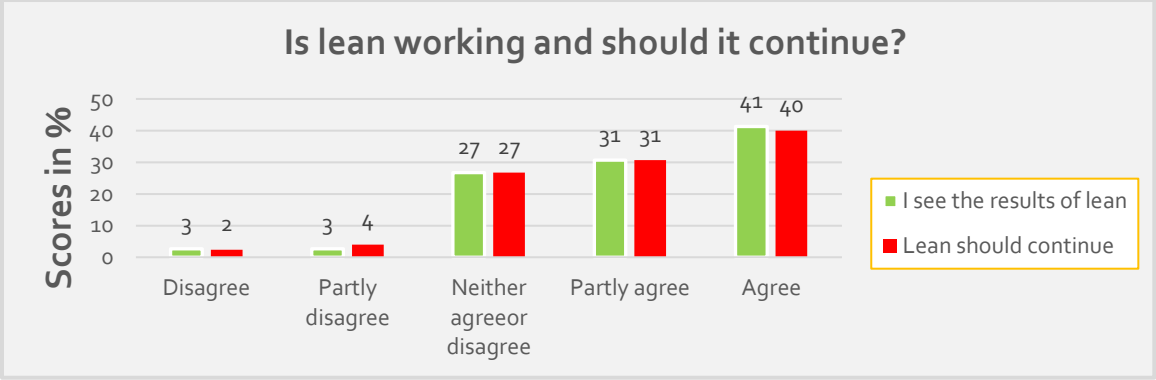
Table 14: Spearman`s correlation test showing correlation between perceived leadership traits and perceived employees satisfaction		
• Global variable – Leadership styles • Global variable- Satisfaction	RHO-Value	P-value
	0.7053	**0.000**

The result reveal that at confidence interval 95% (**α= 0.05**), there is a positive strong significant linear relationship between the two. These results should probably help the leaders in reflecting on their leadership styles as this may probably have significance for their followers' motivation, performance and overall wellbeing. However, leadership alone can`t be used as a yardstick to measure cause-effect of employees' satisfaction since there may be many other factors that have a stake in employees' satisfaction. This argument alone puts this results into question. Nevertheless, the results can be used as an indication of what role leadership style plays in employees' satisfaction.

The future of lean

There were two questions that examined what respondents thought about whether lean is working as intended and should it stay or scrapped using a Likert scale of 1 to 5(disagree to agree). Results from their responses are displayed in figure 26.

Figure 26: Showing employees take on seeing the results of lean and whether to continue with lean



When asked whether lean is working (that they see the benefits/results), 71% of the respondents said they somewhat agree or agree that lean is working (giving results) while only 6 % either somewhat disagreed or disagreed that it is working. The same tendency is seen with question of whether lean should continue with 71% of the respondents somewhat agreeing or agreeing while same for those who either somewhat disagree or disagree being only 6%. Next to be analysed is comparison of the units on the future of lean and whether it's working.

COMPARING UNITS ON SEEING BENEFITS OF LEAN AND LEAN`S FUTURE

On the question of seeing the results of lean, respondents from unit 2 got the highest score with 69.1% saying they the results (benefits of lean) followed by unit 1(59%) and unit

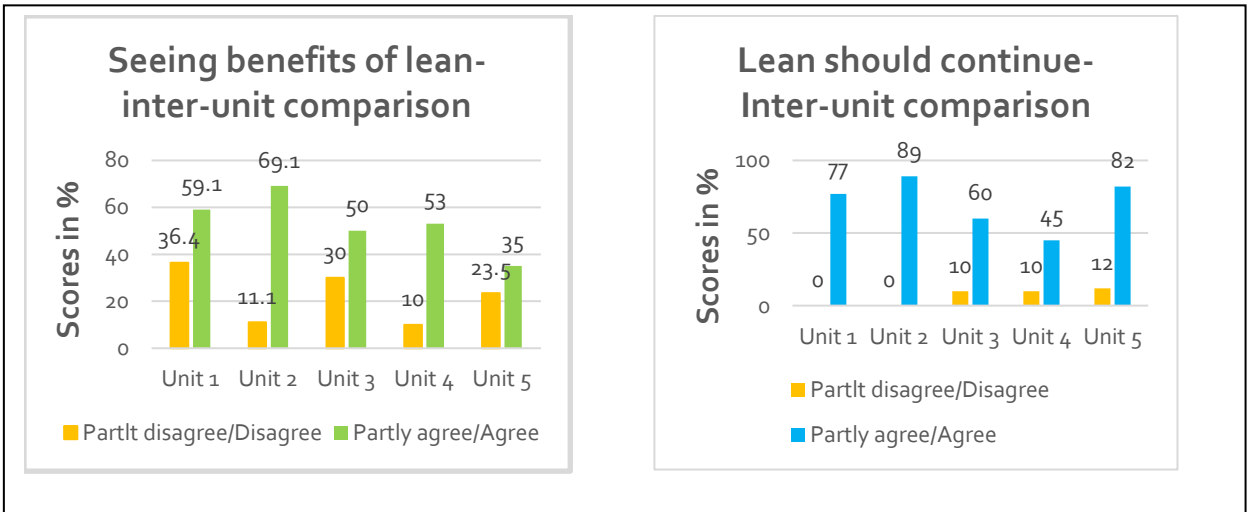


FIGURE 27: COMPARING INTERUNIT RESULTS ON VARIABLES I SEE THE BENEFITS OF LEAN AND LEAN CONTINUE. LEFT GRAPH IS FINDINGS ON BENEFITS AND THE RIGHT ONE IS FINDINGS ON WHAT RESPONDENTS THINK OF LEAN`S FUTURE

4(53%). Respondents from unit 3 seem divided on this issue with 50% indicating on the affirmative while similar number indicating they don't see benefits of the lean. Unit 5 got the lowest score with only 35% of the respondents either agreeing or somewhat agreeing that they see the results. Analysis done on excel spreadsheet on the original data of this question gives an average of 4.0 with a spread of 0.2 indicating that most respondents want lean to continue. Individually, unit 2 respondents seem most positive with 89% of the respondents either agreeing or disagreeing. Unit 5 got 82% being positive followed by unit1(82%) and unit 3(60%). Unit 4 completes the list with lowest recorded score with only 45% of the respondents from their indicating to want to continue with lean. Two interesting things with this analysis is that while respondents from unit 1 with majority indicating improvement ideas are not theirs (figure 22) and that their perception of being empowered is low as shown in figure 22, still slight majority of them as seen in figure 27, indicate of seeing the results and want lean to continue. This contrast is probably an indication that there is lean activity going on of which they see the results and want it to continue but that they don't get involved. Looking at figure 27, majority of respondents from unit 4 (53%) indicated of seeing lean results but only 45% want it to continue. To get a deeper understanding of this disparity, a follow up interview (data triangulation) could have been proper which hasn't been done in this research.

Does one`s length of service matter in perception of lean`s future?

During the interviews, some leaders claimed that those who worked longest in the company are most sceptical to the lean project. To validate the truth in their perception, the question asking respondents on the number of years worked on the company was cross-checked with their answers on the variable that was concerned with perception on future of lean. This variable was measured on Likert`s scale of 1 to 5 (from disagree to agree). Data retrieved from pivot table as presented in figure 29 below show that these seem to be somewhat true. Looking at the data, those who have worked longest (20 years and more) seem to be divided on the issue. While the overall percent for all respondents somewhat agreeing or agreeing was 71%, the average for this group is 46% compared to the rest for instance, those who worked 11 to 20 years (75%), those who worked 6 to 10 years (89%) and those who worked less than 5 years (77%). Not only future of lean, these group also seems to most sceptical when it comes to essence of lean. Data retrieved from pivot table shows that 8 out

14(57%) who indicated the essence of lean program is to reduce workforce come from these group. However, judging on what we see in figure 28, it noticeable that the group has the highest number of `` fence sitters`` who neither agree or disagree (10 out of 26 (38.5%) for these group indicated they are neutral on these issue). These is where the potential lies. The company and it is leaders should double it is effort to reach to these group if the lean program is to succeed. As we have seen, in figure 15, these group form majority of the respondents in all the units of study (33%). From personal experience working in the company, these group seem to form most of the workforce relative to each of the groups. It is therefore vital and for the sake of lean project, these group to be given special attention in terms of lean skills especially on the real essence of the project and why these method is different from the previous methods(Hobbs, 2011)

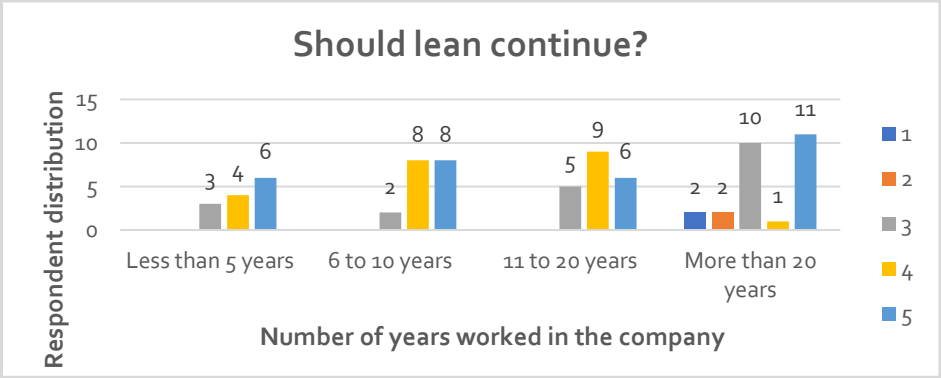


FIGURE 28: RELATIONSHIP BETWEEN ONE`S LENGTH OF SERVICE AND PERCEPTION ON FUTURE OF LEAN

What about education level of person relative to future of lean?

Since we saw in the earlier analysis that those who worked longest seem to be least enthusiastic about continuing with lean, I also decided to check whether one`s level of education affects one`s perception on continuing with lean. Judging from the data retrieved from excel pivot table as presented in figure 29 below, it seems almost the same pattern we saw in the earlier analysis of length of service verses future of lean seem to be repeated. From 29 below, we see that those who stayed in school longest seem to be most positive for the lean project to continue. 19 out of 20 (95%) of those with higher education somewhat agreed or agreed for lean to continue. For with secondary education the score is

62%(somewhat agree or agree) while for those with only primary education the score is 58%. It is however worth noticing that these two groups have a higher number of fence sitters which will mean there is a potential to change their perception if things are probably done different.

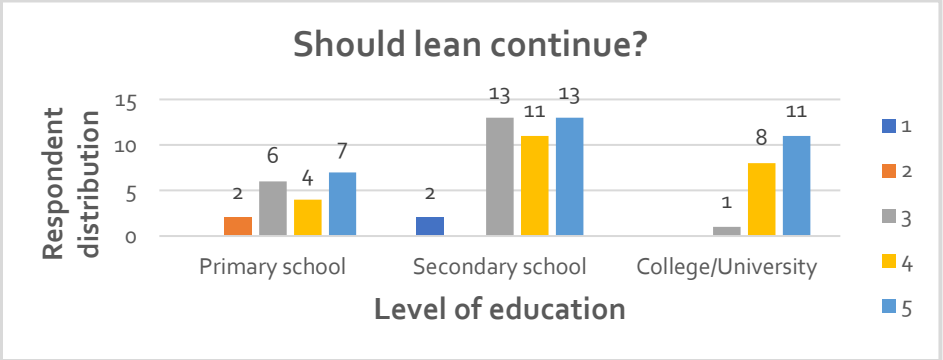


FIGURE 29: RELATIONSHIP BETWEEN ONE`S LEVEL OF EDUCATION AND PERCEPTION ON FUTURE OF LEAN

5.3. Discussion of the results

In this section, the results will be discussed. A discussion of lean implementation status in the units of study will start the pace followed by discussion on the general findings on lean awareness and differences in lean awareness between the units. Thereafter, findings on employees' perceptions based on their experience with lean will be discussed. The section will be closed with discussion of challenges units are facing based on the findings from the survey and qualitative interviews with the resource persons.

5.3.1. Implementation status

The empirical data gathered shows that there is some level of lean activity going on in Norway Post. In the studied units which are all based in Oslo and form the final link in the chain of post distribution network, findings show that there is some level of lean activities going on even though this greatly varies from unit to unit. While the lean project has existed for nearly a decade in the company, it is relatively new in the units studied with lean

project being implemented just one year prior to before the survey was carried. Findings from the study show that even though the lean project was recently implemented in District 2 of Oslo, the level of lean activity is very low with 71 % of the respondents indicating that Lean is never part of the agenda in their units' shop floor meetings. The results also reveal that only 1 out of the five units studied have constantly lean as part of the Agenda with established Kaizen teams and fully installed visual tools like Kaizen board to show implementation status of just concluded improvement projects and new areas that will be focused on next. Even though some visual boards were used immediately after the lean light version project finished, none of the rest of the units use it today as indicated by the interview with the leaders and the survey results.

The findings also reveal that the lean project was correctly implemented as all interviewees description of the mini-transformation shows a commonality with how lean is implemented elsewhere with the correct implementation procedure described by the Danish duo Christian and Sønderby (2008) being followed. It also seems the company`s lean implementation guidelines were followed at least in the project phase with measurements of results, reporting up until the top most executive office and evaluations of the project being done. However, the company`s guidelines for post project phase lean guidelines which are similar to the project phase with measurements, reporting and continuous evaluations expected is not being followed. Findings from this research reveal that none of the units studied does the implementation in strict conformity with the company`s lean guidelines. No measurements of results are done, no reporting of results and evaluations whatsoever beyond the 13 weeks of mini-transformation. Findings also reveal that there is probable evidence to believe that majority of the leaders seem to initiate and execute some improvements in their workstations without necessarily involving the workers. Results from the study show that 72 % of the total respondents saying they see the results of lean(benefits) but only a meagre 13%, report improvement ideas being crowdsourced from them. A previous research in UK business schools and universities lean implementation came with similar finding with lean being entirely implemented by management team without involving the workers(Radnor & Bucci, 2011). It also seems there is no much enthusiasm for lean among the leaders in most of the units of study as depicted by absence of making lean part of the shop floor meetings agendas. This absence of employee

involvement and lack of enthusiasm if not addressed, may have a negative impact on the sustenance of the lean project.

5.3.2. Lean awareness

The first research question was about the level of employees lean awareness in Norway Post? To answer these question, Liker`s first category (philosophy and purpose) and second category (processes with more emphasis on lean tools and techniques) model was used to test employees understanding and recognition of essence of the lean project and tools and techniques employed to make it work. Further, the same question wanted to test whether employees indeed could recognize the non-value adding activities(wastes) and the benefits of lean which came because of elimination of the waste.

Descriptive summary for the four categories testing lean awareness show that the overall average for lean awareness is below 50% score (0.4696 or equivalent of 46.96% with a pooled standard deviation of 0.0834 or equivalent of 8.34%) which is the threshold used in this thesis to determine whether the level of lean awareness is good or not. A 46.96% average is not that far from the 50% cut off point but the huge standard deviation (> 12%) makes us to believe that the real average is probably much less that the 46.95% average score something that makes us believe that the overall level of lean awareness is low. What this data tells us is that the employees level of lean skills is probably low, and an effort should be made aimed at increasing employees level of lean skills for them to actively participate and increase the benefits of lean(Hines et al., 2011). Findings show also show that workers can recall the problematic areas that existed before lean and what happened to them after lean was implemented. This was captured in their perception of areas that need improved then and the aftermath(effects) which all had scores slightly above average. It seems, what need to be given more focus is the process that lead to finding the wastes and effects. This starts with investing employees' tools and techniques skills because finding shows this where the problem lies. From the findings we observed that average score per tool for each employee is approximately 32% which is very low based on our scoring system which seem to be factor that is pulling down the total average score for awareness.

Another critical aspect in this study was to examine whether employees knew the real intention behind the lean project. A study in Poland found out that not all employees knew the real essence of the project(Malinowska & Szymańska-Brałkowska, 2015). Findings in this paper show that the greatest majority of the workers seem to know the essence of lean project as the scores for each of three purpose the company has stated in it is various publications (BAKSTAD, 2009a; Posten, 2015) seem to be acceptable ranging from 46%(improve employees welfare) to customer satisfaction (54%) and 74% (improve economy). A previous study of organizations in USA struggling to convert lean project into tangible benefits that can improve the performance found out that 22% of the companies that had ongoing lean project ``were not getting expected results`` and the reason for this was they didn't knew whether things were being done correctly(Hobbs, 2011, p. 4). Category 2 of Liker`s lean principles state that `` only the right process will produce the right results``(Liker, 2003). The link between this and Norway post`s lean project is that employees seem to understand the philosophy and essence behind the project but probably lack the skills to make it work. That employees somewhat have good understanding of the essence behind the project should be a good foundation to further increase their skills in especially how the processes works and tools needed to make it work. From personal experience, time could be the essence considering the hectic work schedule in the distribution centres something can have an impact in finding an ample time earmarked especially for lean activities without overstretching the ``overtime limit`` which is something that works against the principles of lean which is to reduce costs but also findings show that this is possible given the current tight schedule as one distribution unit has done it and it is results for both awareness and other categories like ``the people``(Liker, 2003) seem to be positively higher than the rest

5.3.2. Differences in the level of awareness

Findings in this study also reveal that the level of lean awareness varies between the different units that took part in the study. For averages of all the four categories used to test level of lean awareness (purpose, tools, wastes and effects recognition) as shown table 15 below, respondents from unit 2 had the highest average for awareness (0.5273) which considering our scoring system translates to 52.73% mark which means acceptable level of

awareness. It is followed by unit 1 (0.4783=47.83%). At the bottom is unit 3 and unit 4 which had averages of (.2640=26.40%) and (0.1907=19.07%) respectively. It can be observed that there is a big difference between especially the first two and the last two. The first two have big data spread compared to the last two. But differences in terms of data spread for each of the units in these two blocks (unit1/unit2 verses unit3/unit4), as it seems, doesn't make up for the wide differences between their overall means. Based on the outcome of this results, it is therefore advisable to periodically do lean awareness measures and execute measures aimed at uplifting in areas where the level of awareness seem to be low while at the same time encouraging those who are doing well in terms of awareness and other measures to do even much better and their standards should be used as benchmark for others to improve their ways.

Table 15: Descriptive statistics. differences in the level of lean awareness between the units of study

	Unit 1	Unit 2	Unit 3	Unit 4	Unit 5
Mean	0.4783	0.5273	0.2640	0.1907	0.3077
Standard deviation	0.1166	0.1013	0.0591	0.0469	0.0942

5.3.3. Perception of lean

The overall perception of Lean as a concept and a force to bring change seems to be good as indicated by respondents clearly saying that they want lean to continue (71%) and that they see the benefits of lean (71%). However, findings in this research also reveal some critical issues that need to be addressed. For instance, majority of the employees have indicated of not being involved in improvement work while at the same time they see the results of improvements. As earlier discussed what this probably is that leaders do some improvement projects without involving the workers. Employees have also indicated of not

being empowered by lean which is not surprising since if they don't get involved in decision making, then it not surprising they feel the way they do about this issue.

Leadership is another critical issue which most respondents loudly indicated that they weren't satisfied. The two most critical parts on leadership which findings in this paper have indicated is that most respondents feel their leaders don't lead by example and that they don't value their opinions. What probably this mean is that even though some lean activities are being carried out, the units involved didn't get the necessary cultural transformation that a lean process requires. Many studies have shown that one of the failures of companies struggling to sustain lean is that they fail to transform their culture(Roth, 2006).

Lean is criticised for increasing employees stress. A workers union magazine(Grimsrud, 2010) has for example written an article on how lean destroyed the working environment for Norway post workers in Bergen town . In that article workers felt more micro-managed and surveyed after lean was implemented in their workstation. In the questionnaire, respondents were asked whether they felt micro-managed and controlled after lean was implemented. A great majority (48 %) felt neutral about this issue while a slight majority of those remaining indicated that they felt micro-managed because of lean while at the same time most of the workers in another related question indicated of being able to use their creativity to solve work related problems. The possible explanation for this mismatch is that the lean project ended barely a year before the survey was carried out and many felt micro-managed and controlled during the lean project because from personal experience, many workers didn't like the idea of lean consultants following them with a stop watch and measuring and documenting every step they took. At the same time, the working culture of the company is similar to the rest of country which in theory is expected to follow the social technical school of governance which is characterised by flat company structures, reflections, learning at workplace, solving problems in teams and giving individuals the opportunity to be creative(Støle & Ekeren, 2015). This probably explains why they feel to have the opportunity to be creative while at the same time feel micro-managed. Overall, the perception of the working environment seems to be good as many have indicated to have a good relationship with their colleagues and that they want to stay in the same company- perhaps a good indication is that they feel good about both their workstations

and the company at large. This is a good starting point for lean to succeed if only issues addressed at the beginning of this section are addressed.

5.3.4. Challenges

Finally, this research has found out there are some challenges that need to be addressed. The challenges seem four-fold ranging from middle level leaders, grassroot leaders, workers to lean concept itself. There seem to be lack of enthusiasm for lean among the leaders. Findings show, only one out of the five units have ongoing organized lean programs that workers are involved in. It seems not much lean has taken place after the lean project. Most leaders talked of ``during the lean project`` and ``what was achieved during the lean project`` rather than what they are doing right now. From this, I have also ground to believe that the most effects were achieved during the lean project something can possibly explain why the overall perception of lean seem to be good. This however might change with time if workers no longer hear or see any lean activity in their place of work.

It seems the lack of enthusiasm among the grassroot leaders is partly connected to lack of enthusiasm from the top. Hobbs(2011, p.21) says that `` If the business transformation is not likely to be supported to be supported by executive leadership, then any efforts to implement lean in the organization from the bottom upward will be like pushing a string``. During the interviews some leaders have indicated lean seem to be under-prioritized by the senior leaders. In such scenario, the few leaders who are still doing some lean activities might abandon it all together if they feel there is absence of signal to support the project from the top.

Findings show that some workers especially long serving workers don't have much enthusiasm for lean probably because they feel the old system is working well and no need to change ``challenge of change``(Hobbs, 2011). A case in point is for instance, workers who worked in the same routes for many years and always finish their jobs in time, don't understand why new standards ``to save time`` must be created. But again, as discussed earlier a quite a big number of this group are ``fence sitters`` on many issues pertaining perception of lean for instance whether the project should continue or not something that

shows challenges from this group can be minimalized with increased awareness about the essence of the project and how the project works.

The biggest challenge associated with the lean concept itself especially in Norway Post case as indicated by the district boss is `` how to carry it in an era when volume is going down``. Further, the swinging post volumes with most of the days nowadays having little volume, as it seems makes it much harder to carry out lean activities because, there can be feeling of why need to work more efficiently when working time is reducing naturally. In other words, lean concept is good, but the timing is bad.

6. Conclusions

The aim of this study was to assess Norway post employees level of lean awareness and perception of lean based on their experiences with lean. To assess the level of awareness and understand employees' perception of lean, a paper-based survey was designed for this purpose. Before the survey was distributed, the items in the survey were pretested with grassroot leaders. The setting was five post distribution centres in Oslo that have recently implemented lean.

Results from the study reveal that employees level of lean awareness in the units that took part in the study is low. While employees can easily recognize which areas that need to be improved and see and appreciate improvements, they don't know the processes that lead to the identification of wastes and documentations of effects. A great investment aimed at improving employees lean skills through training and coaching will help fill this gap. This study infers that there is substantial reason to be optimistic in achieving this as finding from this study has established that at least one unit has done and succeeded with this as indicated by their results of lean awareness which is better than other units that invest little in this end.

Findings from this study show that employees have a positive perception of lean and understand very well the unique possibilities modern systems like lean can help their company navigate through their unique problems brought about by digitization and enhanced competition associated with privatization and globalization. At the same time

respondents voiced some critical aspects associated with management system (lack of involvement), commitment from all leaders at different levels and issues associated with lean itself ranging from issues with ``the timing of the project in an error of dwindling post volume``, the way it was introduced (following workers with stopwatch during the project) and the way standards are set without properly consulting those affected by it.

Based on the above discussions, the following is recommended for Norway Post:

- An evaluation of the lean project starting with measuring the level of lean awareness, effects and understanding perceptions should be carried out. Special focus should be given on whether the right process as outlined in the organization`s lean strategy is being followed. The outcome should be studied thoroughly, and necessary changes recommended and worked on to make things work.
- It seems both employees and their leaders are having some difficulties in differentiating whether enhanced efficiency is due to lean or deteriorating post volumes. In this aspect, an adjusted lean that reflects the current unique situation the organization is facing in should be designed and implemented. Lean consultants have already tossed about this idea, but it seems there is an information gap on how this should be done practically. A proper communication and concretization on how this should be done are called for.
- To get a real lean cultural transformation, a more aggressive approach to leadership training, strict systems of follow up and reporting should be put in place. Those leaders who are doing well should be recognized for their effort during leadership gatherings and those who don't be given a necessary follow up and help if needed.
- Workers should be involved more than it is right now. Special attention should be given in the way standards are set with special focus in balancing the difference in opinions between those who feel the old system is working and those who don't. If new standards aren't working, it is recommended something should be changed but only through consensus from the majority.

6.1 Dissemination and policy relevance

The aim of this paper was to get an in-depth understanding of the implementation status of Norway Post Ltd.`s decade-old lean project with special focus on assessing employees level of lean awareness and perceptions. The findings from this paper are expected to encourage Norway Post to re-evaluate their lean philosophy with the aim of redesigning a lean system that recognizes their unique culture and challenges.

The findings from this paper can also help others who are planning to implement lean in the future or in early stages of lean implementation to learn from the findings and design a system that takes into consideration issues found and discussed in this paper.

6.2. Limitations

This study had many shortcomings that need to be communicated out. To begin with, empirical data was collected from five distribution centres located in Oslo which can be considered too few to represent over 200 post distribution centres in the country. As such, employees level of lean awareness and perception from these few units may not represent the level of lean awareness and perceptions of all employees in Norway Post. However, the data from the 5 units can be considered enough to represent all the 8 distributions centres in Oslo that makeup district 2 which all had a common denominator of starting lean at the same time.

Secondly, the validity of the findings might be affected because of failure to provide envelopes during the data collection in a study where workers were to take a position on issues concerning leadership. This might have created biases in respondents' answers since their own leaders were also responsible for collecting the answered papers. Considering this, it is advisable in a future research that is similar to this one (paper-based survey), to provide envelopes to both enhance anonymity and privacy of the respondents but also the validity of the results.

Thirdly, combining a full-time job with thesis writing was really demanding. Apart from a five-week vacation from the job, the most of parts of this thesis had to be written on weekends and after work. Towards the end, there was no much time left to edit the thesis properly. These might explain why the length of the thesis is long and there could be some language mistakes and other avoidable errors.

Fourthly, the way some questions in the research were asked wasn't good enough. For instance, if things could be done differently, the questions pertaining employees' recognition of wastes and effects could have been on whether they knew how to identify wastes and improvements using lean methods rather than just picking everyday problems and few solutions and then telling them to take positions. A future research in lean awareness pertaining to wastes and improvement recognition should, therefore be more concrete on the way the questions are asked.

Fifthly, a whole sub-category examining employees' recognition of the most effective lean tools and methods had to be omitted from the analysis because there weren't enough responses valid enough to be analysed. This problem couldn't be detected while pretesting the questionnaire with the leaders. Such problems could have been avoided if regular workers were included in the pretesting.

Sixthly, basing findings on employees' perceptions using quantitative data only wasn't good enough. Follow up interviews (Data Triangulation) could have been proper to get a deeper understanding of the real perceptions of the respondents. The idea of follow up interview was tossed but after considering the research already guaranteed full anonymity and the fact that the researcher is an insider, the idea was dropped. Future research with similar problems should probably consider in ways they can do data triangulation without necessarily affecting the anonymity. A simple way out of this could be ``qualitative method only`` on issues pertaining perceptions and attitudes etc but will this also depend on the magnitude of data one is measuring and other factors like time etc.

Finally, there was no ample time to carry out follow up studies in the same units that took part in the research to see if the employees level of lean awareness and perception has changed over time. Lean was just one year old in these units and therefore a one-time study done so close to the beginning of it all may not be enough to capture the impact lean had on

the perceptions of individuals in the organization. A future research in the same units could be proper to get an updated picture of their knowledge of lean and the effects of lean had on their perceptions.

6.3 Proposal for future research

A future research can for instance, build on the limitations discussed in this paper and carry out a similar research without the flaws discussed in the limitations. For instance, the number of categories measuring a general idea may be reduced so as to make both the measurements and analysis easier.

A future research may fill the gap in this research by carrying out a qualitative research that builds on the quantitative results from this research to get an in-depth understanding of the organization`s lean journey.

An organization`s wide research covering employees level of lean awareness and perception may be carried out in the future. The findings of such work should give a nuanced picture of the state of the organization`s lean philosophy status. Such findings should also be generalizable for the whole organization unlike this one(Madsen et al., 2017)

A follow-up research may also be carried in the same units that took part in this study sometime in not the so nearest future to see if employees level of lean awareness and perceptions have changed with time.

Findings from this research has indicated that, even though the units studied belonged to the same company, belonged to the same district under one leadership, had lean training and lean project at the same time, there exist some differences between them in terms of the way employees are involved, their knowledge of lean tools etc. A new qualitative research that investigates the reasons for these differences may be carried in the future.

An interesting finding in this research is that employees low level of lean skills especially the tools probably doesn't matter much for the organization to get some lean effects. A future research may be interested in finding out, how come the organization is getting the lean effects(results) without properly knowing the tools and techniques that can help them get there?

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8. Appendices

8.1 Interview guide

Intervju med 3 distribusjons enhetsledere som har implementert Lean

Innledning.

Presentere meg selv og formålet med intervjuet. Garanterer om full anonymitet og at det er en frivillig deltakelse. Spør om samtykke til lydopptak og at opptaket vil bli slettet ved prosjektets slutt som er forventet å være 15.08.2018.

Bakgrunnsinformasjon

- Rolle/stilling
- Skole gang
- Hvor lenge vedkommende har jobbet i posten og nåværende stedet

Spørsmålene

1- Har posten hatt effektiviseringsprogrammer før Lean?
2- Når ble du først kjent med Lean?
3- Hva er grunnen til at Posten implementerer Lean?
4- Hvor lenge har implementeringen foregått i denne enheten?
5- Hvordan ble implementeringen gjennomført?
6- Hvordan var ansattes reaksjon ved prosjektets start? Negative eller positive?
7- Hva synes de om det i dag?
8- Hvilke strategier bruker dere for å skape engasjement og motivasjon for prosjektet blant ansatte?
9- Hvilket Lean verktøy og metoder bruker dere ved forbedringsarbeidet?
For eksempel: Standardisering, A3 løsning, Kai zen (Kontinuerlig forbedring), Utjevning av arbeidsmengden (Hei junka), kontinuerlig flyt, sløsing(Muda)osv.
10- Hvilket verktøy/metode tror du er mest effektivt i deres arbeid?
11- Hvilke områder har det hatt positive effekter?
12- Har effektene hatt noe å si for konsernets økonomi, kunde tilfredshet og ansattes velferd (HMS)?
13- Hvordan måler dere resultatet av effektene?
14- Hvordan presenteres resultatet til ansatte?
15- Føler du at du har nok kunnskap og ekspertise om Lean for å ta prosjektet til nye høyder?
16- Får du tilstrekkelig støtte fra Posten i form av ekstra Lean relatert kursing og ressurser for å gjennomføre forbedringsarbeidet ordentlig?
17- Har du tilpasset din ledelsesstil for å gjøre implementeringen vellykket?
18- Hvordan balanserer du ledelse -og styring?

19- Er du fornøyd med konseptet Lean selv? Virker den etter hensikten med implementeringen? Er det verdt å fortsette med den eller bør den skrotes?
20- Gjøres det løpende evaluering av effektene og hele prosjekte?
21- Noen ekstra kommentarer?

8.2 Spørreundersøkelse om Lean i Posten

Velkommen til denne spørreundersøkelsen som er en del av mitt siste innlegg i mastergradstudiet økonomi og administrasjon ved Norges miljø- og biovitenskapelige universitet.

Formålet er å kartlegge ansattes kjennskap med Lean verktøyene og metodene som brukes ved sin arbeidsplass og erfaringer med effektiviseringsprogrammet Lean.

Undersøkelsen tar ca. 10 minutter

Data vil bli analysert som en samlet sum og ingen vil vite dine individuelle svar bortsett fra deg selv. Din anonymitet er dermed garantert

Bakgrunnsinformasjon.

Instruksjon: Sette et kryss på svaralternativ som du mener er riktig:

Hvor lenge har du jobbet i Posten?

◯ Mindre en 5 år

◯ 6 til 10 år

◯ 11 til 20 år

◯ Mer enn 20 år

Min høyest fullførte utdannelse?

◯ Grunnskole

◯ Videregående skole

◯ Høyskole/universitet

Hvilken enhet tilhører du?

◯ Torshov-Tåsen distribusjonsenhet

◯ Majorstuen distribusjonsenhet

◯ Skøyen distribusjonsenhet

◯ Lørenskog distribusjonsenhet

KJENNSKAP OM LEAN AKTIVITETER I ENHETEN, HENSYNET, VERTØYER OG METODER

Jeg vet at Lean-relatert forbedringsarbeid foregår i min enhet?

◯ Stemmer

◯ Ikke stemmer

Hvor lenge har Lean aktiviteter vært i din enhet?

◯ Mindre enn 2år

C

◯ Mindre enn 5år

◯ Mer enn 5år

Hvor ofte er Lean et tema i gulvmøtene(Morgenmøter)?

◯ Veldig ofte

◯ Sjeldent

Hva tror du er hensikten med Lean forbedringsarbeidet i Posten? (Flere svar mulig)

◯ Forbedre økonomien

◯ Øke kunde tilfredstillelse gjennom forbedret service kvalitet opplevelse

◯ Forbedre trivsel og samarbeid blant ansatte

◯ Nedbemanning

◯ Vet ikke

Hvilken Lean verktøy/metode brukes i din enhet? Velge Ja eller Nei.

Verktøy/Metode	JA	NEI
Verdistrømkartlegging (Value stream mapping)	◯	◯
Kaizen-Kontinuerlig forbedring	◯	◯
Sløsing- redusere aktiviteter som ikke skaper verdi for kundene	◯	◯
6 sigma – Redusere variasjon i kvalitet-få å perfeksjon	◯	◯
A3-Problem løsning prosess	◯	◯
5s- (Sortere-systematisere-skinne-standardisere-sikre)	◯	◯
Kontinuerlig flytt	◯	◯
Heijunka-Utjevning av arbeidsmengden	◯	◯
Muri- overbelastning av mennesker eller utstyr	◯	◯
Standardisering av aktiviteter/rutiner	◯	◯
Poka-yoke- Teknikker for å hindre/forebygge feil- Fysiske begrensninger f.eks.	◯	◯
Tavlemøter	◯	◯

Andre verktøy/Metode (Skrive her) _____

Hvilket verktøy/metode tror du er mest effektivt i deres arbeid? Ranger hvor viktig

D

Verktøy/Metode	Ikke viktig	Litt viktig	Verken viktig eller uviktig	Viktig	Veldig viktig
Verdistrømkartlegging (Value stream mapping)	○	○	○	○	○
Kaizen-Kontinuerlig forbedring	○	○	○	○	○
Sløsing- redusere aktiviteter som ikke skaper verdi for kundene	○	○	○	○	○
6 sigma – Redusere variasjon i kvalitet-få å perfeksjon	○	○	○	○	○
A3-Problem løsning prosess	○	○	○	○	○
5s- (Sortere-systematisere-skinne-standardisere-sikre)- Arbeidsted organisering	○	○	○	○	○
Kontinuerlig flytt	○	○	○	○	○
Heijunka-Utjevning av arbeidsmengden	○	○	○	○	○
Muri- overbelastning av mennesker eller utstyr	○	○	○	○	○
Standardisering av aktiviteter/rutiner	○	○	○	○	○
Poka-yoke- Teknikker for å hindre/forebygge feil- Fysiske begrensninger f.eks	○	○	○	○	○
Tavlemøter	○	○	○	○	○
Andre (skriv her)	○	○	○	○	○

Hvilket problem områder var det ønsket at Lean tiltak skulle forbedre? (f.eks. Hatt sløsing av tid og ressurser)

Potensiell forbedringsområder	Uenig	Delvis uenig	Verken enig eller uenig	Delvis enig	Enig
Lokale (Uryddig-dårlig bevegelse av mennesker og maskiner)	○	○	○	○	○
Lokalet layout ikke tilpasset ergonomi og trivsel	○	○	○	○	○
Unødvendig bevegelse (ting hadde ikke sin faste plass f.eks. etiketter, tomgodset, biler, paxster osv.	○	○	○	○	○
Overproduksjon (Reklame ikke tilpasset etterspørsel, For mye Obos på enkelt dager)	○	○	○	○	○
Venting (Ankomst på jobb og post forsyning fra østlandsterminalen ikke tilpasset)	○	○	○	○	○
For lite eller for mye post (Dårlig tilpasning av bemanning til volumet- Overbelastning problemer som en mulig konsekvens ved høye volumer)	○	○	○	○	○
For mange lange arbeidsdager (mye overtid)	○	○	○	○	○
Upålitelig utstyr-defekt på biler, vogner, paxster osv.	○	○	○	○	○
Høyt sykefravær	○	○	○	○	○
Rutene er bygd i hverandre- Kjører lang avstand innen en rute (dårlig organisert ruter)	○	○	○	○	○
For mye feil sortert post -mye etterarbeid før dagens slutt	○	○	○	○	○
For mange kunder klager PGA dårlig kvalitet på service (Feil levering f.eks.)	○	○	○	○	○
Dårlig kompetanse utnyttelse	○	○	○	○	○
Nedpakning tid av traller, paxter og biler på morgenen var lang	○	○	○	○	○
Dårlig kommunikasjon og informasjonsflyt	○	○	○	○	○

Hvilket område tror du har blitt bedre etter at Lean tiltak ble igangsatt?

Flyt av materialer og mennesker har blitt bedre PGA layout endring	○	○	○	○	○
Layout endring har bidratt til bedre ergonomi og trivsel	○	○	○	○	○
Alt har sin plass og lett å finne nå	○	○	○	○	○
Det er mer standardisering av rutiner/aktiviteter	○	○	○	○	○
Opplever at antall kunde klager har blitt mindre	○	○	○	○	○
Defekt og feil på utstyr har blitt mindre pga forebyggingsarbeidet	○	○	○	○	○
Opplever at antall jobb-relaterte skader har blitt mindre PGA forebyggingsarbeidet	○	○	○	○	○
Antall feil sortering har blitt mindre	○	○	○	○	○
Reklame overproduksjon problemer er borte (Bedre tilpasning til etterspørsel)	○	○	○	○	○
Bemanning og volum er bedre tilpasset	○	○	○	○	○
Kompetanse utnytting har blitt bedre	○	○	○	○	○
Nedpakning tid av traller, paxter og biler på morgenen har blitt mindre	○	○	○	○	○
Rutene er bedre organisert nå	○	○	○	○	○
Vi går ut på rutene tidligere enn før	○	○	○	○	○
Sykefraværer har blitt mindre	○	○	○	○	○
Overtidsbruk har blitt mindre	○	○	○	○	○

Hva er ditt perspektiv på forbedringsarbeidet?

Læring, Innflytelse og trivsel	Uenig	Delvis uenig	Verken enig eller uenig	Delvis enig	Enig
Jeg har mulighet til å bruke min kreativitet til å løse mine problemer	○	○	○	○	○
Jeg har innflytelse på hvor mye jeg kan belastes	○	○	○	○	○
Tiltakene til forbedring kommer fra oss ansatte	○	○	○	○	○
Jeg får tilstrekkelig tilbakemelding på mitt arbeid og forslag	○	○	○	○	○
Feil brukes til læring enn konsekvenser	○	○	○	○	○
Samarbeid og psykososiale forhold mellom kolleger har blitt bedre	○	○	○	○	○
Ledelsen verdsetter våre synspunkter	○	○	○	○	○
Det er god balanse mellom ledelse og styring	○	○	○	○	○
Ledelsen leder ved eksempel	○	○	○	○	○
Lean har ført til mindre arbeidspress og bedre bemyndigelse	○	○	○	○	○
Jeg forbinder Lean med økt rasjonalisering, detaljstyring og overvåking	○	○	○	○	○
Jeg er fornøyd med opplæring vi har fått fra Lean teamet	○	○	○	○	○
Jeg har variert arbeid	○	○	○	○	○
Jeg er stolt av min yrke og min arbeidsplass	○	○	○	○	○
Jeg har ikke lyst å bytte min arbeidsgiver og arbeidsplass	○	○	○	○	○
Jeg ser klart resultatet av forbedringsarbeidet	○	○	○	○	○
Jeg synes forbedringsarbeidet bør fortsette	○	○	○	○	○

Mange takk for at du har tatt deg tid til å svare på spørreundersøkelsen

8.3 Forespørsel om deltakelse i forskningsprosjektet

" En undersøkelse av medarbeidernes Lean ferdigheter og perspektiver"

Bakgrunn og formål

Formålet med denne studien er å kartlegge ansattes Lean konsept ferdigheter og deres perspektiver basert på deres erfaring med Lean. Det overordnede målet med denne studien er å øke bevisstheten om viktigheten av å vurdere arbeidstakeres Lean-bevissthet (-ferdigheter) og oppfatninger om Lean, på veien mot å lykkes med Lean og å ivareta det.
Prosjektet er en del av mitt siste innlegg i mastergrad studiet økonomi og administrasjon ved Norges miljø- og biovitenskapelige universitet.

Du er valgt å delta i denne undersøkelsen fordi effektiviseringsprogrammet LEAN implementeres i din arbeidsstasjon.

Hva innebærer deltakelse i studien?

Deltakelsen innebærer dine erfaringer med forbedringsprosjektet ved din arbeidsplass. Om du er første linje ansatt, deltar du i en spørreundersøkelse som tar omtrent 10 minutter. Om du er en ressursperson som f.eks. enhetsleder, mellom leder eller en Lean navigatør deltar du i et intervju som tar omtrent 40 minutter.

Hva skjer med informasjonen om deg

Data fra spørreundersøkelsen vil bli analysert som en samlet sum og ingen vil vite dine individuelle svar bortsett fra deg selv. Din anonymitet er dermed garantert. Dine opplysninger fra intervjuet vil bli anonymisert og ingen vil kunne gjenkjenne deg direkte ved publiseringen av oppgaven. Alle data materialer fra intervjuet (notater og eventuelle lydopptak) slettes ved prosjektets slutt.

Prosjektet skal etter planen avsluttes 15.August 2018.

Frivillig deltakelse

Det er frivillig å delta i studien, og du trenger ikke å gi noen grunn om du ikke ønsker å delta i undersøkelsen.

Min veileder ved dette prosjektet er Jens Bengtsson jens.bengtsson@nmbu.no

Studien er meldt til Personvernombudet for forskning, NSD - Norsk senter for forskningsdata AS.

Med vennlig hilsen,

8.4 Norwegian centre for research data(NSD)

Idris Amin

Jens Bengtsson

P.O.Box 5033
1432 ÅS

Vår dato: 25.01.2018 Vår ref:58368 / 3 / AMS Deres dato: Deres ref.

Vurdering fra NSD Personvernombudet for forskning § 31

Personvernombudet for forskning viser til meldeskjema mottatt 15.01.2018 for prosjektet:

58368	Norwegian post puts its signature on lean solutions
Behandlingsansvarlig	Norges miljø- og biovitenskapelige universitet, ved institusjonens øverste leder
Daglig ansvarlig	Jens Bengtsson
Student	Idris Amin

Vurdering

Etter gjennomgang av opplysningene i meldeskjemaet og øvrig dokumentasjon finner vi at prosjektet er meldepliktig og at personopplysningene som blir samlet inn i dette prosjektet er regulert av personopplysningsloven § 31. På den neste siden er vår vurdering av prosjektopplegget slik det er meldt til oss. Du kan nå gå i gang med å behandle personopplysninger.

Vilkår for vår anbefaling

Vår anbefaling forutsetter at du gjennomfører prosjektet i tråd med:
- opplysningene gitt i meldeskjemaet og øvrig dokumentasjon
- vår prosjektvurdering, se side 2
- eventuell korrespondanse med oss

Vi forutsetter at du ikke innhenter sensitive personopplysninger.

Meld fra hvis du gjør vesentlige endringer i prosjektet

Dersom prosjektet endrer seg, kan det være nødvendig å sende inn endringsmelding. På våre nettsider finner du svar på hvilke endringer du må melde, samt endringsskjema.

Opplysninger om prosjektet blir lagt ut på våre nettsider og i Meldingsarkivet

Vi har lagt ut opplysninger om prosjektet på nettsidene våre. Alle våre institusjoner har også tilgang til egne prosjekter i Meldingsarkivet.

Vi tar kontakt om status for behandling av personopplysninger ved prosjektslutt

Ved prosjektslutt 15.06.2018 vil vi ta kontakt for å avklare status for behandlingen av personopplysninger.

Se våre nettsider eller ta kontakt dersom du har spørsmål. Vi ønsker lykke til med prosjektet!

Marianne Høgetveit Myhren

Anne-Mette Somby

Kontaktperson: Anne-Mette Somby tlf:55 58 24 10 / anne-mette.somby@nsd.no

Vedlegg: Prosjektvurdering
Kopi: Idris Am
in, idris.moalim.amin@nmbu.no

8.5 Pictures showing before and after lean implementation in one of Norway Post`s distribution centres in the country (Source: Anonymous lean navigator)

8.5.1 Picture 1: showing disorganisation and chaos in distribution centre before lean was implemented.

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Translated description of the picture (Modified Lean navigator`s own words)

Picture 1: Shows the chaos and disorganization in the distribution centre before we worked on layout and change of routines. All workers met at 09:30 a.m. and were in a morning meeting until 09:40a.m. When the workers came out of the meeting, they had to look for their post and spent 65 minutes before they went out to their routes.

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8.5.2 Picture 2: Showing total chaos. Incoming post from sorting terminal were not marked with which routes they belonged to.

Translated description of the picture (Modified Lean navigator`s own words)

The driver from the sorting terminal delivered all the post in this time (9. 30a.m), there was no mark on the device so the mail was placed differently each time which led to a lot of exploration for the bids

8.5.3 Picture 3: Showing absence of disorganization after lean was implemented

Translated description of the picture (Modified Lean navigator`s own words)

- A team was formed to work with proposals for measures to reduce the time spent on looking for post.
- All cars got fixed parking slots
- 3 people rolled the post out behind the cars and left the advertisement in each car – All members of the team did the same in turns so everyone in the team learned the process and could come up with ideas that could make things better.
- The workers came out of the kaizen board meeting and went straight to their cars, uploaded their post in their cars and drove out to their respective routes.
- The upload time was reduced by 50 minutes on average each day by route (30 mailboxes, 50 minutes, 5 days a week = 208 hours and 45 minutes saved per week).

This was one of many measures we implemented on this distribution centre.

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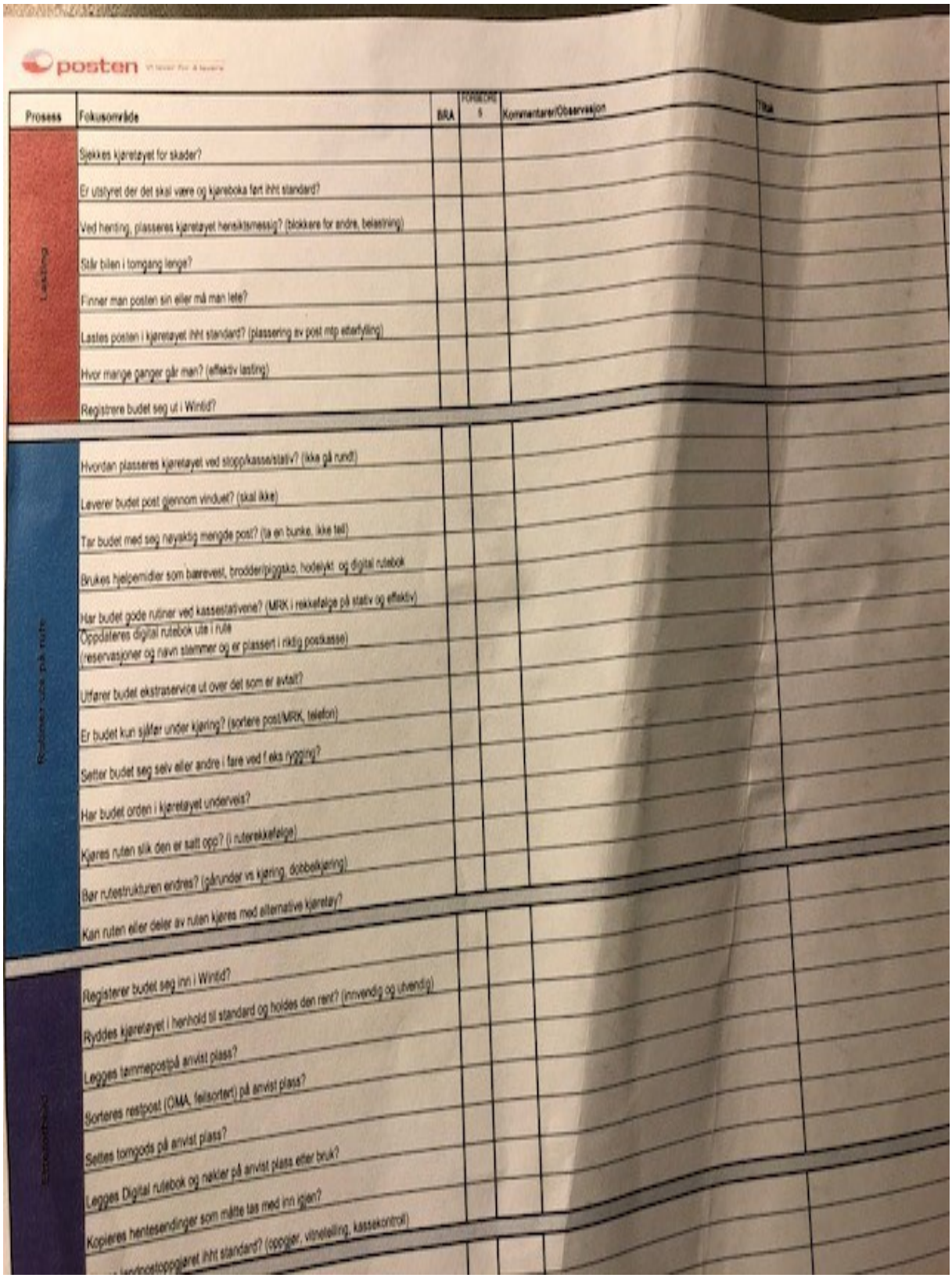
8.6. Gemba walk forms

8.6.1 Standard Gemba walk form



posten

Prosess	Fokusområde	BRA	FORBEDRE S	Kommentarer/Observasjon	Tiltak
Lasting	Sjekkes kjøretøyet for skader?				
	Er utstyret der det skal være og kjøreboka ført ihht standard?				
	Ved henting, plasseres kjøretøyet hensiktsmessig? (blokkere for andre, belastning)				
	Står bilen i tomgang lenge?				
	Finner man posten sin eller må man lete?				
	Lastes posten i kjøretøyet ihht standard? (plassering av post mtp etterfylling)				
	Hvor mange ganger går man? (effektiv lasting)				
	Registrere budet seg ut i Wintid?				
Rutekjøring ute på rute	Hvordan plasseres kjøretøyet ved stopp/kasse/stativ? (ikke gå rund)				
	Leverer budet post gjennom vinduet? (skal ikke)				
	Tar budet med seg nøyaktig mengde post? (ta en bunke, ikke tell)				
	Brukes hjelpemidler som bæresele, brodder/piggsko, hodelykt og digital rutebok				
	Har budet gode rutiner ved kassestativene? (MRK i rekkefølge på stativ og effektiv)				
	Oppdateres digital rutebok ute i rute (reservasjoner og navn stemmer og er plassert i riktig postkasse)				
	Utfører budet ekstraservice ut over det som er avtalt?				
	Er budet kun sjåfør under kjøring? (sortere post/MRK, telefon)				
	Setter budet seg selv eller andre i fare ved f.eks rygging?				
	Har budet orden i kjøretøyet underveis?				
	Kjøres ruten slik den er satt opp? (i rekkefølge)				
	Bør rutestrukturen endres? (gåruter vs kjøring, dobbeltkjøring)				
	Kan ruten eller deler av ruten kjøres med alternative kjøretøy?				
Ekspedisjon	Registrerer budet seg inn i Wintid?				
	Ryddes kjøretøyet i henhold til standard og holdes den rent? (innvendig og utvendig)				
	Legges tømmepost på anvist plass?				
	Sorteres restpost (OMA, feilsortert) på anvist plass?				
	Settes tomgods på anvist plass?				
	Legges Digital rutebok og nøkler på anvist plass etter bruk?				
	Kopieres hentesendinger som måtte tas med inn igjen?				
	[illegible]stoppgjøret ihht standard? (oppgjør, vitnetelling, kassekontroll)				

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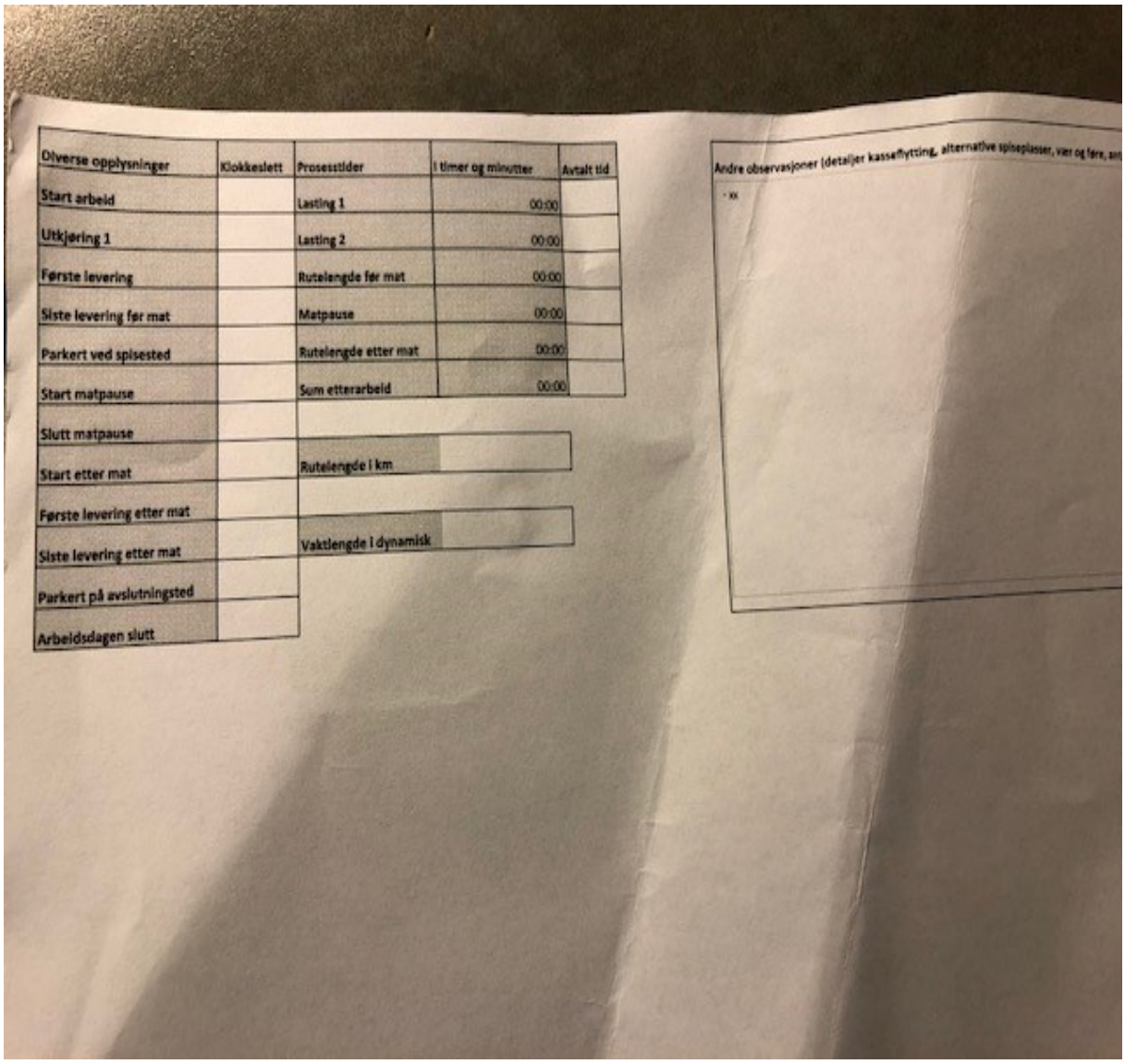
8.6.2 Simplified Gemba walk form



Diverse opplysninger	Klokkeslett	Prosesstider	I timer og minutter	Avtalt tid
Start arbeid		Lasting 1	00:00	
Utkjøring 1		Lasting 2	00:00	
Første levering		Rutelengde før mat	00:00	
Siste levering før mat		Matpause	00:00	
Parkert ved spisested		Rutelengde etter mat	00:00	
Start matpause		Sum etterarbeid	00:00	
Slutt matpause				
Start etter mat		Rutelengde i km		
Første levering etter mat				
Siste levering etter mat		Vaktlengde i dynamisk		
Parkert på avslutningsted				
Arbeidsdagen slutt				

Andre observasjoner (detaljer kasseflytting, alternative spisesplasser, vær og føre, an

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Norges miljø- og biovitenskapelige universitet
Noregs miljø- og biovitskapelege universitet
Norwegian University of Life Sciences

Postboks 5003
NO-1432 Ås
Norway