Designing for personalized onboarding learning experience for a global audience

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Number of characters with spaces: 151.379

Number of pages: 63

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Date: 08-11-2018

Abstract

At many companies onboarding is in the spotlight due to their importance. New employees enter organizations frequently, therefore, the training programs must be fit for all. The main focus of onboarding is the process of integrating new employees into the company and help them acquire the necessary knowledge, skills and behaviours to become an effective member of the organization.

The thesis investigates the onboarding activities more specifically e-learning activities during onboarding at Novo Nordisk, Denmark. The current onboarding activities focus only on the company onboarding to Novo Nordisk, its culture, introduction to practicalities and internal policies. This resulted in a need for a different focus where the onboarding system will support new employees different learning needs, learning preference and prior knowledge. Therefore, the thesis aims to carry out a research on how to help Novo Nordisk in their effort to create a system for more personalized job onboarding experience with the aim to provide new employees with the right skills and competences they need when they first start working at the company.

Due to the high demand for harmonizing the onboarding activities at Novo Nordisk the thesis aims at redesigning the current onboarding system in order to fulfil the company wish for a new conceptual model with the focus on different learning needs.

The research question explored in the thesis is the following:

How to create a conceptual model for a corporate learning environment to support the onboarding process into a personalized learning experience on a global scale?

In the empirical study of work, design based research approach has been selected to drive the design process to develop a solution. This approach begins with the desk research to discover relevant and available material that has been published on the field of onboarding. The thesis work continue with the identification of the problem by interviewing secondary stakeholders. Later with the help of the primary stakeholders, the Future Workshop is organized in order to create a new solution. The approach demonstrated that the user- centered design method is a suitable method to gain understanding of the user needs. The data collected and analysed by using meaning condensation and hermeneutic meaning interpretation and the result used to create a low fidelity prototype.

The overall result of the research demonstrates how the new system's interface, information architecture and interaction design should be in order to fulfil the need of the users.

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1. Introduction

Technology and its evolution play an important role when designing a new solution for the future. Based on a PWC report (2017), workforce will be completely different in 2030 from what it is now. Rapidly expanding technologies such as automation and artificial intelligence will affect every level of business and its people. Demographic shifts, urbanization, redistribution of global economic power, resource scarcity and climate change will affect the workforce in the future (PWC, 2017). 52% of CEO's express an interest about how combining humans and machines can be an advantage, while 39% are concerned about the influence of artificial intelligence on the future workplace. The focus on humans, HR solutions, and programs like "One fits all" need to be redesigned to deliver new learning and development models (PWC, 2017).

Novo Nordisk (NN) is a global healthcare company with 95 years of innovation and leadership in diabetes care. Their aim is to help people defeat obesity, haemophilia, growth disorder and other diseases. NN has affiliates or offices in 79 countries including 16 production sites on five continents. With headquarters in Denmark and products marketed in more than 170 countries, NN employs 43100 people globally. The company culture is open and offers a diverse and fair working environment. NN aims to ensure the best possible career development for everyone working at the company. By providing a satisfactory working environment NN consider itself able to attract and develop some of the best talents from all over the world. (Novo Nordisk, 2018).

The effective and engaging onboarding to culture and business aspects of the company is crucial to NN. Presently NN's focus is to provide the minimum requirements that ensure that all new employees are exposed to the most important messages about the company. Therefore, every new employee is assigned to a local onboarding process at the latest on the first workday. The local onboarding programme includes key messages and knowledge about NN, and further along the onboarding process, includes specific content related to the job role of the new employee. The process is designed in a way that allows each employee to finish the programme within the first three months of employment.

This thesis is based on the idea to design the ideal onboarding system with a focus on an elearning solution that provides new employees with personalized learning materials and a continuous learning experience in a corporate environment. The paper is an attempt to find the best solution for a system and show how it should be conceptualized for future purposes. The paper does not mean to give the answer to all the problems that an onboarding system can face, but it is meant to provide an ideal future solution based on the end users wishes for such a system.

1.1 Introduction to the Novo Nordisk onboarding system

The introduction programme is called iNNtro and consists of three different sessions (see Figure 1.). It is a web-based information package which is accessible from before the first day at work and provided by Corporate People & Organization (CPO). It is translated into 15 different languages, takes one hour to complete, it is free of charge to use it and covers the content of minimum onboarding curriculum. It is part of the onboarding program, but it is not tracked for completion and no tests are to be taken at the end.

The three sessions are pre-start, post start and a "learn more" session. The pre-start session gives the introduction to NN even before the first day at work. It is a web-based information package accessible from the home of the new employee.

Post- start section is an introduction providing the most important key messages about therapy areas, business and workplace. It enables employees to build a basic understanding of the company and helps them build knowledge. It is available on the first day at work.

"Learn more" part is a simple web-based information about the company. It is designed to help employees to further explore topics based on their interest and needs. While these courses are not tracked for completion, it is part of the onboarding process.

Further training is necessary during job onboarding, and it is called IsoTrain and LearnIT. IsoTrain is a system for training modules in which completion needs to be tracked and documented in one of the Learning Management System (LMS). On the first day at work, a list of training modules is created by the manager of the new employee. It contains the most necessary training courses in relation to the job role. For training activities, it is required to pass the test in a given time in order to complete the training. Training also comes in various forms at NN e.g. Standard Operating Procedure; eLearning; and training sessions online, in a classroom, or at the shop floor depends on the role of the new employee. E-Learning courses and knowledge tests are designed and built by the eLearning tool Articulate Storyline that is compatible with the IsoTrain system.

The LearnIT system is in place on an LMS 2. It is a different LMS system from the IsoTrain. LearnIT contains job-related modules, made by learning professionals or anyone at the company who needed to create one. Documentations are prepared for helping people to do so. It is not tracked for completion, and it is free of charge. Here the employee can browse and find eLearning modules on their own, but it can be assigned by the manager.

Besides iNNtro, IsoTrain and LearnIT, new employees must go through the local onboarding that is taken place at their new department. It is part of the socialization process with welcoming and introduction to co-workers, meeting with a buddy who helps to adapt to the new role and the culture of the company.



Figure 1. Onboarding and learning activities at Novo Nordisk

Overall, the onboarding process is taking minimum 3 months, depending on the job role. The onboarding starts even before the first day at work of the new employees. It is designed to educate new employees about the company culture and business and helps to ease them into the company culture. The new employee will be assigned with further training based on the roles and learning needs by their manager and its completion is tracked and documented.

1.2 Problem Statement

NN is a global company with 54 career sites and several recruitment systems where technology, processes and systems are tightly connected. The onboarding process at NN provides new employees with the most important key messages about the company with a focus has only been put on company onboarding. This resulted in a need for a different approach where the aim is to harmonize the onboarding system that would provide a more personalized experience for the new employees. The effort of the company would provide new employees with the right skills and competences they need to accelerate their performance when they first start working at NN.

The main question:

How to create a conceptual model for a corporate learning environment to support the onboarding process into a personalized learning experience on a global scale?

The following research questions will help to answer the problem statement:

1. How to maximize the eLearning-onboarding ecosystem that supports personalized learning experience for new employees?

2. How can end users needs be met and addressed effectively for a Global audience?

In order to address the research questions, design based research approach is selected as a framework for the design development. To understand the whole process and flows in the system, more specifically around eLearning activities during onboarding to NN, the project work starts with the literature review to discover relevant and available material that has been published on the field of onboarding. Then the thesis work continue with interviewing secondary stakeholders who are responsible for overseeing the creation and maintenance of the onboarding activities at NN. Based on the knowledge collected from the literature review and interviews, the Future Workshop is organized where primary stakeholders at NN, more specifically millennials, criticizes the current onboarding system and then create a new solution. The new solution is based on the participants wishes and needs and combined with the literature review result on current practices. Based on the collected data, a low fidelity prototype is created.

1.3 Purpose of the project

The purpose of the project is to harmonize the onboarding and more specifically eLearning activities during onboarding at NN by creating a solution. Taking into account NN's existing onboarding system, the aim of the project presented in this master's thesis is to fulfill NN's wish by designing an onboarding eLearning solution that would result in adding value to its new employees from the start of their employment. The new system is meant to help newcomers to perform better, to feel empowered by the new knowledge and thereby to help them settle faster in their new job role in a shorter time. One of the main challenges is to create a personalized experience for newcomers and to provide an opportunity for them to give feedback about the onboarding experience.

Considering the existing issues and the goals associated with the research topic, the aim of the project is, therefore, to develop a conceptual model for the eLearning environment to support job onboarding at NN.

2. Context phase

The first phase of the DBR model is Context phase. The main activity in the context phase is to identify the problem in regards to e-learning during onboarding by characterizing the situation and collection of data. Defining the challenges and objectives in onboarding will help to gain deep understand of the problem. To gain knowledge about the research topic different fact finding techniques were used in a form of desk research, stakeholder analysis, interviews to identify any existing problems in the practice (Bentley, Dittman & Whitten, 2007 ch.6).

2.1 Literature review

The purpose of the literature review is to discover relevant and available material that has been published in the field of onboarding, e-learning and user as co-designers. It also aims to help achieve a deeper understanding of these topics, identify problems and weaknesses, discover the state of knowledge of onboarding and workplace learning in order to develop an argument about the significance of the research (Bryman, 2016, ch.5). The findings will provide a significant contribution to the field of research and help answer the research question.

This section aims more specifically to discover how learning occurs during the transition into new roles and in relation to this, how organizations support the newcomers at the company. Furthermore, related works on workplace learning and eLearning will be reviewed along with participatory design. The literature review provides an overview of previous research, current knowledge and trends in the field aiming to help identify issues and support an argument on the matter for the thesis research. The chosen method to conduct the literature review is narrative reviews (Bryman, 2016, ch.5. pp. 110-1) which combines results from studies where different methods and procedures address different questions, in contrast with systematic reviews where selected studies address the same questions and using comparable methods such as meta-analysis in quantitative studies (Baumeister, 2013; Baumeister & Leary, 1997). Furthermore, the research aims to identify issues, problematic areas by reviewing articles and combining different kinds of evidence to formulate a broad theoretical background on the subjects. By using narrative reviews the scope of the research can be less focused and more wide-ranging; this can appear as a lack of comprehensiveness, but can also help to establish the reason to do research.

Four main topics are central to be examined in order to position the knowledge in the field.

- Onboarding
- Workplace learning, e-learning and personalized learning experience
- Millennials as a new workforce
- Participatory design and user as co-designer

2.1.1 Onboarding

The purpose of this section is to get an overview of onboarding, as well as to discover the current trends and the challenges in the field. Here, the aim of the section is to critically analyze relevant studies to understand why onboarding is challenging for newcomers, what are the specific onboarding practices organizations use, how does learning occurs during onboarding, and to discover what effects it has on the newcomers.

Onboarding programs are in the spotlight in almost every organization due to their importance. They deal with the same problems, how to socialize and train new employees effectively so they can perform their tasks and become a valuable part of the organization. New employees who needs to be trained enter organizations frequently, which means the training programs must be fit for all.

Onboarding is a process of integrating new employees into the organization and its culture by helping them to acquire the necessary knowledge, skills, and behaviours to become effective members of the organization (Snell, 2006; Smoothing the transaction, 2017; Graybill et al., 2013; Klein & Polin, 2012). The effective onboarding program enhances performance, job satisfaction; it enables new employees to reach their full productivity in the shortest time, to gain access to information, tools and materials that help them perform better in their new role (Snell, 2006; Guðmundsdóttir & Lundbergsdóttir, 2016; Graybill et al., 2013; Klein & Polin, 2012). Thus, the underlying goal of the onboarding program is to create an inviting and positive experience for the new employee (Graybill et al., 2013). Onboarding programs can be different from company to company and can run from one day to six months or even longer after entering the company (Graybill et al., 2013).

At many organizations, the onboarding processes have a common theme that is based on indoctrinating new employees into the organizational culture (Cable, Gino, & Staats, 2013). According to Cable et al. (2013), the traditional methods of onboarding have some weaknesses, even when the programs seem useful. Most of the programs assume that the organizational values have to be thought to the newcomers who then accept and adopt them. The organizational values' aim is to enable new employees to learn, fit in and conform to organizational norms and at the same time to give leaders control over what they can expect from newcomers. Cable's research (2013) discovered that this traditional method of onboarding is not always effective enough to retain employees and it might create a tension when newcomers feel that their own identity is less important than it really is. Furthermore, new employees may not feel fully engaged; this could lead to low employee engagement, emotional exhaustion and work dissatisfaction (Cable et al., 2013).

To create a better onboarding program, human resources professionals need to build and retain talent by focusing on the importance of getting employees to understand and commit to the companies' values starting on the first day at work. According to Cable et al. (2013) an approach that seems giving long-lasting effects for both the company and the employees, called "personal-identity socialization", encourages newcomers to express their unique knowledge, perspectives and strength from the first day at work with the manager's supervision. Cable's

(2013) research discovered that shaping the onboarding process around individual characters has a significantly better effect on employees' job satisfaction, attitudes and behaviour, not to mention the organizational benefits.

Globalization has an effect on the workforce. Dispatching key employees to all over the world and hiring people from all corners of the earth has become a routine practice in global companies (Smoothing the transaction, 2017; Guðmundsdóttir & Lundbergsdóttir, 2016). Their onboarding has different implications from local companies. While global recruitment must pay attention to multicultural barriers, language diversity, higher recruitment rates and different culture impart (Snell, 2006), local companies do not have to pay attention to all these aspects. Improving the onboarding process can reduce the time to contribute to new employees and prevents the extra cost of poor onboarding (Snell, 2006).

The current trends in onboarding were influenced by the arrival of the millennials and by the development of technology (Graybill, Carpenter, Offord, Piorun, & Shaffer, 2013). The onboarding programs can start even before the first day of a new employee, giving instructions on e.g. parking, information on organization's history, a welcome message from the Chief Executive Officer (CEO) and so on (Graybill et al., 2013).

According to Snell's (2006) research, the socialization activities during onboarding are important for the newcomers and integral to a successful onboarding. The socialization activity leads to positive outcomes for new employees such as higher job satisfaction, better job performance, greater organizational commitment, and reduction in occupational stress and intent to quit (Snell, 2006; Klein & Polin, 2012). However, providing socialization activities that seems to be an important deal of the onboarding process hard to perform. The onboarding systems can only provide automated correspondence that is embedded in workflows. To help the newcomers' socialization to the company, organizations support them with team building activities and a mentor or buddy, along with a possibility to create a network online e.g. social media (Graybill et al., 2013). The key to successful onboarding is a complete and consistent process either online or offline. It can be a well-functioning technology platform that is aligned with other processes, a flexible platform to address department level needs, along with seamless workflow and easy integration with the talent management system (Snell, 2006).

Besides the technology-based onboarding, a mentor or a buddy can help ease the first couple of days or longer by introducing the newcomer to the work environment and co-workers as part of a socialization activity (Guðmundsdóttir & Lundbergsdóttir, 2016). Furthermore, a follow up on the new employees' onboarding experience is fundamental to create an effective program (Guðmundsdóttir & Lundbergsdóttir, 2016).

Snell's (2006) research discovered the four components that are critical for the design and management of a successful onboarding process: Process analysis, implementation, integration and reporting dealing with the configuration of onboarding technology with newly hired administration portal, information of newly hired and creation of key metrics and analytics for monitoring and for the continuous improvement. Process analysis has many components but mainly includes the review of the onboarding

process and role impacts. HR department, new hires and the hiring manager are the primary stakeholders whose activities are involved in designing a successful onboarding (Snell, 2006). According to Snell (2006) the optimized onboarding process is well designed and automated that reduces cost, boost productivity and improves employee satisfaction. Therefore, organizations strive to determine what can generate business process improvements.

2.2 Workplace Learning, e-learning and personalized learning experience

In this section, the focus is on workplace learning. The introduction starts with an overview of different forms of learning at a workplace and its changes during time due to trends and technology. E-learning will be discussed along with emerging trends, strategies, interpretations and implementations of the changes. Later millennials and their special characteristic will be discussed along with users as co-designers in design projects.

2.2.1 Workplace learning

A new trend emerging in the labour market that brings rapid changes in business needs and Learning and Development (L&D) (Ellis & Kuznia, 2014). To effectively train employees, companies must adapt to the changes in new technology, new trends and expectation of the employees (Solis, 2017; Eraut, 2011). All these changes impact the modern workforce as different ways of learning have become prominent. There are many modes of learning in the workplace. Formally organized learning events, formal training, being coached or informal learning through work, learning by doing, learning by discussing with others, learning by teaching others, vicarious learning (learning by observation), learning by trial and error and selfstudy (Eraut, 2011; Milligan, Margaryan & Littlejohn, 2013). Within both types of learning process, the formal and informal, short activities, which contributed to learning, like asking questions or receiving feedback are favourable to enhance productive engagements and learning (Eraut, 2011). Online learning has also changed during the time into a personalized digital experience along with social learning (Solis, 2017). Short courses and special events considered effective when they are "just in time", but manuals or reference books only welcome when it links to formal qualifications from professionals (Eraut, 2011). Information needs to be ready and available to everyone all the time. Learning in small bite-sized content preferred and incorporated into the daily workflow while also collaborating and networking with peers to support active learning (Solis, 2017). In the traditional way of learning where a big chunk of information and many hours of information were provided, the learning was not enough effective as nobody can retain hours of information and use it at work effectively.

According to Samah & Ali, (2011) the growing difference between individuals suggest that differences must be taken into account when preparing the learning procedures. The differences between individuals can be many including learning orientation, cognitive styles and learning styles, but the emphasis on individual differences in learning increase learners satisfaction or motivation towards learning (Samah & Ali, 2011). Martinez found that (2001) (as cited in Samah

& Ali, 2011) learners are more successful when their individual learning orientation is matched with the right learning environment. The online environment is prefer to be the personalized learning environment more specifically a website (Samah & Ali, 2011).

Milligan, Margaryan & Littlejohn's (2013) exploratory study aims to examine employees' learning during the transition when new employees and experienced employees move into new roles within a global company. The aim of the study is to understand whether new or more experienced workers differ in the way they experience learning during the transition if they have a favourite mode of learning, awareness of the learning or how they see the learning during the transition. Nicholson's 1984 study (as cited in Milligan et al., 2013) was used to understand the factors that influence an individual's performance as they make the transition to a new role. Nicholson's (1984) research showed that individual factors of new employees such as initial skills and knowledge, expectations, prior experience and motivation and the organizational socialisation tactics influencing the learning and integration during the transition. The findings indicate that both novice and experienced newcomers tried different modes of learning. For the novice, individualised approach is preferred, while acquiring knowledge formally and learn socially through interaction with peers. Company's goal to foster innovation and create new knowledge is important as the use of coaches and social network that impart a strong company culture. When experienced newcomers change position at the company they do not receive organisational socialization activities and that can create frustration among them. During role adjustment experienced employees can fall back to old and possibly ineffective strategies that they bring from previous positions.

2.2.2 ELearning at workplaces

E-learning is on the rise to provide an alternative mode of learning for many companies. This form of learning contribute to a collaborative learning environment for employee training (Ellis & Kuznia, 2014). According to Ellis (2014) the globalization of the business today requires a more flexible learning possibility to employees. Due to different countries or long distances this way of learning can reduce training cost, environmental impact of business travel and it is an effective way of broadcasting information. E-learning is using a digital technology to provide learning solutions and to support learning and organizational goals. Furthermore, e-learning can take place anywhere due to telecommunication and information technology and therefore it become a preferred learning method for global corporations (Ellis & Kuznia, 2014). The increased use of online and blended learning, collaborative technology, digital books, open source software, and mobile learning are transforming e-learning continuously (Ellis & Kuznia, 2014).

The launch of Learning Management Systems (LMS) take over the future of learning ((Ellis & Kuznia, 2014). LMS are present in almost every large company with its prior aim to deliver and track training. The role of these systems is also changing due to the demand for a change in the workforce (Ambrose, 2010). Employees are now expecting learning tailored to their unique needs, whereas companies try to catch up and place a premium on flexibility and integration with other systems (Ambrose, 2010). User-friendly and effective courses are provided by the

senior management to support organizational culture and innovations for employees (Ellis & Kuznia, 2014).

Ellis and Kuznia (2014) study discovered that commitment from top management is necessary along with end users involvement who should be part of the planning and implementation process of e-learning. Employees have to be comfortable using e-learning systems and software to accept changes in the organization. This lead to employees satisfaction towards their work.

There are limitations when employees using e-learning. Among many problems managers can be too busy or having no interest in e-learning or they can not identify learning needs (Ellis & Kuznia, 2014). Therefore, corporations have to formalize and structure training in a way that its success is not threatened. The training programs have to be available to managers with the involvement of the training experts. According to Ellis's (2014) survey 74 % of employees believe that e-learning leads to a higher job satisfaction while only 38% were satisfied with e-learning at work. The dissatisfaction might be due to a lack of proper training or the usage of e-elearning system, however, the survey discovered that participants dissatisfaction based on the quality of the learning product, lack of accessories and lack of support or poor internet connectivity.

Companies are already working on incorporating technology-based learning and using instruction-led design elements, different multimedia integrations, games and simulations (Ubell, 2010). It needs to be mentioned that today's workplace is shared by four generations. While all age groups enjoy learning as a necessary part of their working life, learning preferences vary among them. The older generation prefers face to face training or classroom training while the younger generation learning by doing on a digital platform (Ambrose, 2010). According to Wolfson & Kraiger (2014) technology based training is becoming very important in

organizational settings due to the aging workforce where training delivery methods has to follow trends to stay effective at the workplace. Different generations are influenced by different levels of motivation and affected by different levels of cognitive speed and working memory capacity (Wolfson & Kraiger, 2014). While different levels of cognitive speed is an influential factor, research shows that prior knowledge is equally important for learning and developing new knowledge (Beier & Ackerman, 2005).

Newton and Donga (2007) (as cited in Ellis & Kuznia, 2014) reported that why corporate involvement in e-learning is important. It increases the knowledge, the efficiency and productivity of employees and ease the implementation along with time and cost savings. Further benefits are the ability to deliver training anywhere, anytime, and to anyone. Just in time training, personalized training, higher collaboration and interactivity are preferred by learners while better monitoring system on employees' performance and progress; customized and personalized training options are the other benefits according to Ellis and Kuznia (2014).

2.3 Millennials

There is a lot of research and opinions about who millenials are but most of the research is confusing or contradictory (Deal, Altman & Rogelberg, 2010). According to Deal et al. (2010) technology has changed and affected how millennials use it. People who start using the technology at an earlier age generally have a better relationship with it than those who started using the same technology later in their lives (Deal, 2010). Cell phones and social network are indigenous to millennials; this resulted in them being "wired" differently according to Hershatter et al. (2010). Millenials are more effective in multitasking, filtering information or responding to visual simulations, but face-to-face interaction or understanding non-verbal clues make them less competent (Hershatter, 2010). According to Hershatter (2010) millenials care about institutional values because they are interested in working with organizations that drive change. However, when the fast-paced business requires immediacy, ability to communicate concisely, millennials must learn how to read between the lines or scan information. Millennials can work within existing structures but they need resources and support to solve the tasks (Hershatter, 2010). Furthermore, millenials are collaborative and the issues they have to face inspire them to find a solution and move forward (Hershatter, 2010). They prefer to accumulate skills and knowledge that will assist them in their lives and work.

Millennials in the workforce expect to have access to technology (Bannon & Ford, 2011). To fulfill millennials' learning needs, companies need to understand the millennials' mindset and what keeps them motivated. Millennials grew up with digital interaction and feel more comfortable in the digital world while using the technology (Bannon & Ford, 2011; Ferri-Reed, 2013). Gewald, Wang, Weeger, Raisinghani, Grant, Sanchez & Pittayachawan (2017) characterized millennials as a group of "digital natives" whose work is heavily influenced by the technological innovation, e.g. internet, email, smartphone, etc. These special characteristics set them apart from the other generations. They tend to prefer environments that emphasize teamwork, social learning, knowledge sharing and frequent feedback more than the routine task in the previous generations along with professional development opportunities and the ability to make a difference in the organization (Trees, 2015; Ferri-Reed, 2013). Millennials prefer to use social tools that help them get in contact with peers who can help them build knowledge and skills (Trees, 2015). Although older generations are becoming motivated and acclimated to use such a technology, they have a lot to catch up with millennials in term of adaptation or engagement (Trees, 2015). According to Trees (2015), because social networking tools are important for millennials, organizations are willing to change their attitude towards them.

According to Ferri-Reed (2013) organizations need to implement an onboarding program with learning technology that is more agile, adaptive and accessible to be able to provide a good learning experience for the newcomers from day one. The requirements for such a system include the involvement of millennials in planning of onboarding; adding more visual content, such as videos, interactive web pages and smartphones format; having brief information in short text format and summaries; integrating social media, blogs, chatrooms or online video conference; adding interactive elements; having an opportunity to collaborate and working in teams; providing only relevant content and lastly providing feedback that help them in their current and future career development. Furthermore, having a buddy or a mentor who helps

integrate into the organization, collaborating with other departments on small projects is also preferred by the millenials.

2.4 User as Co-designer in Participatory Design

In this section, the focus is on the users as co-designers. It begins with a presentation of the historical background of the participatory design to illustrate the evolution of the importance of it during the decades. Two case studies will be analyzed, then, the users as co-designers will be examined along with issues and trends in the field of the subject.

2.4.1 Participatory Design

Participatory Design (PD) took root in Scandinavia and later spread across northern Europe and North America in the 1970's (Bjerknes & Bratteteig, 1995; Bødker & Pekkola, 2010). It started as a political movement in a Norwegian Iron and Metal Workers Union (NJMF) in the 1970's with a debate on the sociotechnical design tradition to put social needs above technical wants (Bødker & Pekkola, 2010). The movement aimed to increase working life democracy and was characterized as a user-rather than management-oriented approach (Bjerknes & Bratteteig, 1995). It was called cooperative design at first, and started as a democratic ideal in which everyone has to have a chance and the rights to participate equally in the decision concerning his or her life (Ehn, 1993).

The strategy that shapes PD has two important features. One is the political one, where this approach raises questions of democracy and taking control over at workplaces, while the other one is technical (Trischler, Pervan, Kelly, & Scott, 2018). The end users become co-designers and actively participating to create and design a solution for themselves. In this way, end users can help discover unmet needs and ensure that the result meets their expectations and that it is usable in the future (Trischler et al., 2018).

The pioneering works started by Kirsten Nygaard in the NJMF research project where the project design was still traditional (Ehn, 1993). A project group, steering committee and local trade unions were involved, where unions acted as the reference group. As the project progressed, it turned out to be impossible to apply the project findings to the daily work due to the fact that the original project design was copied from the traditional research project approach where managers' goals were predefined and the goal with the project had been long established, while unions had no plan or goal for their involvement (Ehn, 1993). For this reason, a new research strategy had to be developed. The new plan involved changes in the union's involvement, where instead of supporting the researchers, the researchers would support the unions. In this case the union chose the topic among important problems to investigate at the workplace (Ehn, 1993).

As a result, the NJMF project and its approach between researchers and workers and trade unions influenced other projects, such as DEMOS in Sweden, DUE in Denmark and a Nordic project UTOPIA where the focus of research and design moved from political discussion and

union work to more work-oriented constructive design for future users (Bødker & Pekkola, 2010).

Despite all the efforts put in them, not all of these early projects met the initial expectations. Some of them could only influence some areas of work to a certain degree, e.g technology or training. From a union's perspective, important aspects for workers to develop new skills, or increase influence on work organization were still limited (Ehm, 1993).

The project that led to focusing on work-oriented approach was introduced in 1981. The UTOPIA research project is one of the most recognized examples of trying out new ideas as a cooperation between Nordic Graphic Workers' Union, researchers in Sweden and Denmark (Ehm, 1993). The UTOPIA project was the start of the cooperative movement and opened up for the concept of user participation. Today, the approach has been used all over the world as a result of early research projects. The importance of these early projects is marking the start of the PD.

Two case studies were analyzed and discussed by Grønbaek, Grudin, Bødker & Bannon in 1993 regarding several issues that affect successful cooperation with the end users. One of the issues is the identification and timing of involvement of the users in the project development. Second is the nature of the contract governing agreement, and the third is to find out which one is more insightful, the process or the product focus.

Case study 1.

Grønbaek et al.'s (1993): The advanced workstation project, based on a large product development company who brings together a team of software engineers to develop a workstation in 1985. The project was part of a marketing strategy and had a free design schedule with the focus on the human-computer interface. The team never involved nor had experience working with users in the design process. During the process of product development, the project organization collapsed due to the pressure. The groups who were involved in the project were either not connected with each other or their contacts and agreements were minimal. The involved parties considered themselves as a spokesperson for the users and never brought prospective users into the development process. Human Factors group tested some features on company employees, but it did not fulfil the criteria of doing cooperative design nor was it a real user involvement. It needs to be noted that in this project there was no real user involvement during the development process, only during user testing.

Case study 2.

Grønbaek et al.'s (1993): The school administration project, both users and developers accepted the need for cooperation. It was a long-term, 4 years project to develop an administrative system for 100 schools with 3000 end users. The system consisted of 10 subsystems, who worked in parallel and in cooperation with each other. The initial terms of the project included an agreement regarding the involvement of users as well as their organizations and an initial requirements specification by the customers. Then, the system developers, along with the management, refined the requirements and laid down the requirements for all the

subsystems. It included the paper mock-up that was tested on the end users and turned out to be incomplete and out of touch for the users. Then, in order not to lose the initial investment, the customer renegotiated the original contract and established a process contract. New requirement specifications were set for each subsystem by the design team and the users. The new prototype was tested by the users and on the basis of this test, the requirements were modified and the price negotiated. The product went through a couple of tests, corrections and was finally implemented in the user organization. At the end, the prototype evaluation experience contributed to the incremental development process with the end users, involvement in every subgroup by producing requirements, evaluating changes and testing the prototypes.

The two cases demonstrate various problems when establishing the involvement of users in the project work. In the first case, the main problem was the lack of user involvement, due to having no tradition of involving them. In the second case, the choice of users turned out to be a mistake due to their job roles and lack of understanding of work processes, as they mainly worked on the management level without an overview of daily activities in administration.

Several issues were discovered and brought up some important points in these cases.One is the identification of partners and users to be involved. Identifying relevant stakeholders and partners in development necessitates a careful consideration regarding planning. In the first case, the profile of future users were poorly defined due to having no tradition of user involvement. The development team was identified early, but their product focus made it difficult for users to participate. This means that the development team was focusing on delivering the product and that other parties had difficulties joining in until certain stages. Instead of this approach, focusing on the process would have been more beneficial allowing for other parties to join into the development process.

In the second case, the involvement of an inadequate user was a mistake. Choosing representative users is difficult and early identification of all parties is preferred to establish a good cooperation.

Another issue is the timing of user involvement, the contracts and agreements governing a project. In the second case, several renegotiations and contracts were made. The first contract was based on the assumption that the system development can be set on the initial specifications made between the management level of users and developers. Due to issues with user engagement, the customer recognized the need for renegotiation of the contract in order not to lose initial investment. After renegotiation, the second contract offered a more flexible approach to the project development with iterative design and incremental delivery of subsystems.

The last issue is the product focus of most projects. The traditional system development project starts by creating the product specification with the assumption of future user needs by designers or developers. In this approach, the design or developer team's interaction with the users is limited to certain phases, mainly to the evaluation phase. In these cases, the team misses out on the opportunity to discover some of the most valuable and customer-centered solutions.

While in a different approach such as in PD, where PD represents a potential break with traditional approaches to system development, an approach to design strategy is to bring the end users into the focus of the design process from the beginning (Trischler, Pervan, Kelly & Scott, 2018; Greenbaum, 1993). The reason why user participation is important is not only because it helps improve the current knowledge but because by enabling users to participate, it also reduces resistance to change and increases workplace democracy (Bjerknes, 1995). The democratic approach means that is giving equal rights for people to take part in the decision-making to people who had little or no power before.

Today, due to new trends, different approaches can be observed in the PD field. Distributed participation and open innovation are still in need of user participation.

2.4.2 Users as co-designers

The evolution in design research is changing and shifting from the user-centered approach to co-designing with users which affects the involved parties, the designer, the researcher and the users (Sanders et al., 2008). Researches in user-centered design pointed out that user- friendly applications are not enough, they should rather be coming from the practices of people using them (Trischler et al., 2018). From a company perspective, the potential success of a service offering depends on the company's ability to understand how customers create value for the service offering (Trischler et al., 2018).

Co-design, also called "co-creation" or "cooperative design", is the key to gain an understanding of the users and their experiences. These terms are often confused by the meaning of them, therefore this paper refers to users as co-designers in a broader sense to highlight the collaboration between professionals as designers and users who are not trained in design (Sanders et al., 2008). According to Trischler et al. (2018) co-design is a form of customer co-creation practice characterized by the exploratory process and creative design approach, where problem and solution emerge. Co-design is tightly connected with the tradition of participatory design, which is the key to gain access to the experiencer's world through user involvement.

When the evolution started in the1970's with the idea to bring people into the project development process, human involvement is emphasized to create a system that worked in practice and based on the need of the users. The user-centered design approach has raised issues of social interaction in the workplace and helped with developing new ways to design human-computer interfaces (Trischler et al., 2018).

For example, in North America, where the PD movement has grown out of the Scandinavian worker-oriented design approach, the procedure was only applicable with modifications. The approach called Cooperative Design was more beneficial, as its origin lies in user-centered design and the Scandinavian worker-centered approach to create a cooperation between system developers and users (Greenbaum, 1993).

Co-designing with end users is an effective approach to innovate and create a successful new solution when combining customer insights with user needs and in-house professional knowledge (Trischler et al., 2018; Greenbaum, 1993). Therefore, this approach became important and firms were willing to experiment by using end users as co-designers in their projects to some degree. This kind of cooperation between users and professionals required rethinking the tools and techniques used to achieve such a quality that produces better products (Grønbaek et al., 1993). The codesign approach has ways to engage users in the process e.g. in the form of facilitation, time of engagement, process phases of involvement or level of contribution from users and stakeholders. Although user involvement becomes more and more important (Ehm, 1993). While some studies highlight the positive side of co-designing with end users, some companies are more sceptical about this approach and its possible outcome (Trischler et al., 2018).

The diagram by Sanders & Stappers (2008) demonstrates what happens when designing with users. The fuzzy front also called pre-design includes the understanding of users, the exploration of information technology, the different ideas and design criteria that are chaotic at the beginning. Here, many activities take place to help move forward towards different ideas that at the end will form a product, a service or a solution. According to Sanders & Strappers (2008) the goal of the exploration at the beginning helps to determine what is to be designed in the end. After the fuzzy front end, the next step is to develop an idea into a concept through a traditional design process and later develop into the first prototype. The prototype goes through iterations and feedback from the future users.



co-designing

Figure 2. The front end of the design process has been growing as designers move closer to the future users of what they design. Adapted from Sanders & Strappers (2008) HC design research as practised before and now p.6.

When designing with users, the identification of prospective users is important. Research suggesting that the successful outcome of the project is based on the identification of the lead users (Trischler et al., 2018). Different studies compared key innovation outcomes between ordinary users and advanced users measured in terms of user benefit for future use, feasibility for implementation, and novelty (Trischler et al., 2018). The advanced type of users identify

problems or needs before others and have the ability to contribute to the innovation of the service. These users recognized as having the ability to contribute to the development and their motivation is from innovation related benefits to solve problems and collaboration (Trischler et al., 2018). Having the lead user in the co-designing team produces many benefits, but some studies argue that the lead users often have different needs compared to average users (Trischler et al., 2018). However, the involvement of lead users can result in an increment of product variety and have a positive effect on customer acceptance. Based on Trischler et al.'s (2018) research paper there is some evidence suggesting that ordinary users are more likely to contribute to generating novel ideas as they are more likely to be able to think out of the box. The average users do not have special knowledge of the technology or feasibility for product implementation. Their involvement, however, can also result in too many ideas, which is not feasible for implementation. Dialogue between the designer team and users may help to focus on ideas that are beneficial and feasible for future purposes.

That raises a question if users are capable of helping firms to innovate or in what degree they ideas are feasible. Others argue that involving users may only lead to incremental innovation which is in contrast to studies finding that users are able to generate new ideas.

Despite the literature that focus on constantly exploring new ways of user involvement, not many studies reveal the outcome of the cooperation between the design team and users. Teams and the collaboration in teams and their approaches can affect the design process and the outcome. The individual members and their characteristics, organizational and contextual factors are all important, as they highly influence the success of the project. The individual factors of the team members can influence the team's creativity and innovation.

Reflection

Even though the research will not reach the full development phase with the development team involvement, it is important to follow the PD rules during the research. However, the theoretical background mostly focuses on the service design approach with the involvement of the design team, the finding is still relevant for the thesis outcome. The fundamental of PD can be and will be implemented in different cases where the focus is on innovation and user involvement.

The importance of involving users as co-designers is unquestionable in order to fulfil the criteria to design a system that is based on their needs. To achieve this goal, a clear project focus was set, stakeholders and future users were defined and their participation from the beginning of the research project was incorporated into the development process. The users were selected based on Tischler's et al. (2018) research. The user participation are inevitable for designing a system that create value for the users and will not be rejected later by them. The users' unique knowledge is key to innovation and to the service's success. However, the outcome of the research can raise a question about the findings and its relevance to NN.

3. Methodology and design of the study

The chapter presents the research methodology and the design of the study. First, the research will be located within a theory of science paradigm to help develop knowledge, methodology and methods. The design-based research (DBR) is presented and explained how it was used to guide the research process including the data collection methods. Later, the participants, data analysis, the role of the researcher and ethical considerations will be discussed.

3.1 Theory of science

The chosen theoretical framework influences the way knowledge is studied and interpreted in the study (Mackenzie, & Knipe, 2006). The paradigm guides the selection of tools, selection of participants, and methods used in the investigation. Without choosing a paradigm, there is no basis for choosing methodology, methods, literature or research design (Mackenzie, & Knipe, 2006).

Qualitative research in an information system can be and often is associated with interpretivism or positivism but in this case, the research approach is more of a design research that can be located within pragmatic grounds. The aim of the master thesis being to redesign NN's e-learning experience during onboarding based on the target group needs. Moreover, the aim is to investigate the problem through the user's eye and later show how their needs can be facilitated through an ICT system.

The research's aim will therefore be addressed from the theory of science paradigm of pragmatism, with a phenomenological approach. Wicks & Freeman (1998) (as cited in Godkhul, 2012) have added pragmatism as a third alternative to the interpretivism and positivism approaches in qualitative research. Pragmatism thinking has influenced the Information System (IS) research as it is associated with action, intervention and constructive knowledge (Godkhul, 2012). Furthermore, Creswell (2009) indicates that "pragmatism as a worldview arises out of actions, situations, and consequences rather than antecedent conditions (as in postpositivism)" (p. 10).

Researchers in the pragmatic paradigm emphasizes the solution to the research problem instead of focusing on methods. With the research, the problem is in focus on data collection and analysis methods are chosen to provide insights. Pragmatism also focuses on the validity of ideas and the difference the ideas can make in practice with "what works" and "how" the action takes place and not committed to any one system of philosophy or reality (Mackenzie, & Knipe, 2006; Creswell, 2009, ch.1). Therefore, the essence of this paradigm is based on the constant action and change of the world to create knowledge in order to make a purposeful difference and improvement (Godkhul, 2012).

While pragmatism is considered a mixed method research, in their study, Mackenzie & Knipe (2006) state that the most important is that the method matches the specific research questions and the purpose of the research. Furthermore, the paper argues that some paradigms may favour specific approaches, in effect to no paradigm prescribes or prohibits the use of either methodological approach.

In qualitative research, there are many different approaches to conduct a study. One is the phenomenological approach, where the researcher identifies the experience of the research participants about the research topic (Creswell, 2009, p.13). Phenomenology is relevant to understand the qualitative research interview. According to Kvale & Brinkmann (2015):

"phenomenology is a term that points to an interest in understanding social phenomena from actors' own perspective and describing the world as experienced by subjects, with the assumption that the important reality is what people perceive it to be" (p.30).

The researcher chooses the interview method in order to learn more about the participants' experience (Englander, 2012). To make sure the phenomenological research produces the same quality as the scientific research, the methodology must be aligned with the theory of science to achieve rigour (Englander, 2012). In true experiment, the phenomenological approach also involves observing the participants, but one can do qualitative research in other ways (Englander, 2012).

To keep subjectivity is challenging in qualitative research; qualitative researchers are usually criticized for being too subjective, because the research findings can be influenced by the researcher's characteristics and views about what is significant and important for her (Bryman, 2012, p.405). A qualitative study is difficult to reproduce, since there are no set procedures to follow, only the researcher decides on what to focus on (Bryman, 2012, p.405). Generalization of the findings is also a problem when a small number of participants interviewed, as it is impossible to know how the findings can be generalized in another context (Bryman, 2012, p.406). Therefore, it is crucial to make the quality of theoretical conclusions out of the qualitative data and not rely on the generalization of the population (Bryman, 2012, p.406). Lack of transparency is another problem; therefore, the selection of participants and data analysis has to be described fully and follow the chosen methods.

Based on the pragmatism theory with a phenomenological approach, the study's aim is to solve a real world problem while examining ideas to find out what works. With the epistemological approach the user experience and user involvement are an essence to understand the problem. Without the user involvement, it would be difficult if not impossible to investigate what the user needs in order to design a right onboarding system for them. During the process, the researcher sets her experience and previous knowledge aside and focus on to understand the need of research participants. The data collection and analysis method will reflect on the chosen theory of science. Furthermore, the selection of participants for the data collection method involves that the researcher makes sure the subjects have the experience that is necessary for the research. The researcher also needs to have an idea of what the phenomenon is all about beforehand, but has to suspend the pre-understanding to keep objectivity in place.

In summary, the research is located in the pragmatic paradigm, because it is oriented to a realworld problem. With the phenomenological approach the meaning that is created during the interviews and the future workshop will contribute to make a difference in real life. Furthermore, the meaning and the validity of idea is closely related to the context where the research has taken place. The pragmatic paradigm with phenomenological approach focuses on the research problem and applies all the data collection and analysis methods that is likely to provide insights into the research question.

3.2 Learning theory

In the learning environment learning theories and pedagogical approaches along with principles and instructional strategies are equally important (Ally, 2008, p.18). The chosen strategy should motivate learners in a way that help them facilitate deep processing and support individual differences while promote meaningful learning (Ally, 2008).

3.2.1 Constructivist learning theory

Constructivism is standing in new grounds where cognitive development and deep understanding are in foci (Fosnot, 1996). In the theory learning is a complex and nonlinear process where people learn and construct their own understanding and knowledge of the world (Fosnot, 1996). The learning subject construct learning through experiencing and reflecting on those experiences. The learning occurs through observation, information processing, and information interpretation, and then translate those into knowledge (Ally, 2008, p.18-20). The theory reorganizes constructions which is used to facilitate problematic situations that end up with puzzlements and questions which supports discourse and development (Fosnot, 2005).

Constructivist learning theory will be used to design the e-learning system to help learners conduct new knowledge that are based on real-world problems, experiments and work situations. To be in line with the constructivist learning theory the learning material must support the learner active learning process. The learning material is customized in order to support personalized learning. That mean it has to fit for all, including learners with diverse learning styles, backgrounds, ages and professions. Grouping of the learning material into smaller bits is necessary along with the reduced number of learning material versions to support learning (Tavangarian, 2004).

3.2.1.1 Design considerations regarding constructivism that is relevant for instructional design

The constructivist learning theory supports customized learning materials, that based on the previous knowledge and interest (Tavangarian, 2004). Furthermore, learner has to have a possibility to raise and generate questions and test them out. For example using real life examples challenges the user to investigate the problem. Having enough reflection time is important due to the driving force of learning. Enable dialog with a community where the user can ask questions and interact with other community members. Learning through social interaction is preferred. There must be a function where user can easily reach out to other community members or those who could help by answering his or her questions. Forum, chat room or discussion room can be a solution when designing for interaction between community members in order to gain knowledge (Tavangarian, 2004).

3.3 Using qualitative methods

In this chapter the aim is to present the methodological process of gathering empirical material, examining and analyzing the findings, and arriving to conclusions. The outline of the research follows the main steps of Foster's (1995) study (as cited in Bryman, 2012, ch.17). The section also explains the process of choosing a methodological standpoint for the thesis, planning and executing interviews with the Employer Branding & Digital Acceleration Director and the Quality training manager at Novo Nordisk. It explains the planning and execution of the future workshop method with Novo Nordisk employees, four millennials between 18 and 29 years old. The workshop participants either recently started working at the company or worked there less than a year and volunteered to participate and share their opinions and ideas about the e-learning activities during onboarding. In addition, the section will also describe the analysis of each of the interviews and the finding of the future workshop.

Future workshop findings will be described by pressing on the understanding of the participants and show how to reflect upon the subject through continuous intervening and participation during the workshop. The chapter will conclude ethical issues while working with humans in the research.

3.3.1 Design- Based Research approach

DBR found to be a suitable approach for the design development. DBR is a methodology that originates in the pragmatic paradigm where learning is taken place in every iterations. Here, the focus of DBR is to develop a theory rather than testing hypothesis (Barab & Squire, 2004). According to Barab & Squire (2004) DBR is not an approach but a series of approaches, with the aim to produce new theories and products to impact learning and teaching in an everyday settings. The model signifies the research iterative nature, where new knowledge arises in every iteration (Barab & Squire, 2004). In addition, research participants in the model are treated as co-participants in both design and analysis (Barab & Squire, 2004). Therefore the aim of using

DBR is to structure the design process in order to improve and change learning practices while collaborating with end users.



The model consists of four phases: Context, LAB, Intervention and Reflection (Figure 3.).

Figure 3. Design-based research model. (Adapted from Gynther, 2010)

The presented thesis is structured according to DBR, however only Context and LAB phase were used due to the scope of the thesis.

3.3.2 Data collection method

Qualitative data collection method is chosen to collect data. This type of data collection methods are typically more flexible than the quantitative data collection method and allows greater spontaneity and adaptation of the interaction between the researcher and the interviewee (Bryman, 2012, ch. 20). Interviews are one of the prominent methods in qualitative research. They vary in their form and structure from semi-structured to open ended to eliciting (Bryman, 2012, ch. 20). Interviews can be conducted in public or private, and with groups or individuals (Bryman, 2012, ch. 20). When using the interview method, the researcher has a flexibility to ask open-ended questions that can be worded a little bit differently for each participant (Bryman, 2012, ch. 20). This approach may make participants feel freer to respond in their own words.

The aim of the interview is to collect all the necessary data needed to answer the research questions. To make sure the data collection will provide the necessary data, the researcher must decide on the form of the interview. The interviews that will be carried out have to follow a similar theme in order to minimize the differences between interviews. It also necessitates the flexibility to let the interviewees express their understanding of the onboarding system. Therefore, the research strategy focuses on the more open-ended questions that is typically the case with qualitative research and the semi-structured life world interview.

3.3.3 Semi- structured life world Interview

In this project, the goal of the interviews is to gain deep contextual understanding of the current stage of the e-learning activities during onboarding at NN, to understand how the interviewees see the current system and the future for providing better experiences for the newcomers to the company. The result of the interviews should provide information about the interviewees understanding about the current system, challenges with the system, their beliefs of what is good in the system or what needs to be done differently. The detailed understanding of the current system and the interviewees perspectives set a significant point of orientation in the study. It will help to formulate the bases for the future workshop, which aim is to create a new conceptual onboarding model with the help of the end users. The type of interview is ideal for this kind of exploratory study is the semi- structured life world interview. This type of interview attempts to understand themes from the subject's everyday life and their perspectives (Kvale & Brinkmann, 2015, p.31).

In the semi- structured life world interview, the script is incomplete, and it comes close to an everyday conversation but has an overall plan for investigation (Kvale & Brinkmann, 2015, ch.2). The questions are open-ended to help guide the interviewees to express their opinion in a free manner, provide opportunity for them to bring up interesting statements and insights that might be valuable for further investigation in relation with the topic. This means that the researcher prepares some open-ended questions beforehand, but there is still a need for improvisation during the interview session (Myers & Newman, 2007; Bryman, 2012, ch. 9,11,17,20). The interview guide with open-ended questions help the researcher to explore and learn as much as possible about the current stage of the onboarding at NN. Keeping questions open-ended will increase the chance to learn more about the topic when prepare closed questions. See interview guide in Appendix 1.

Pragmatism with a phenomenological philosophical view will drive the research. Pragmatism is against the idea of the representation of reality, where language and knowledge are not copying reality but only helping coping with a changing world (Kvale & Brinkmann, 2015). The knowledge is produced socially due to the interaction between the interviewer and interviewee, where the interviewer's knowledge of the topic is required to keep up the conversation and to ask follow-up questions based on the interviewee's answers (Kvale & Brinkmann, 2015, ch.3).

3.3.4 The role of the researcher

The role of the researcher is critical to quality and to ethical decisions in the qualitative study (Kvale & Brinkmann, 2015). During the interview the researcher became the instrument of obtaining knowledge with her familiarity with value issues and ethical guidelines or the research topic (Kvale & Brinkmann, 2015, ch.4). Furthermore, the researcher's knowledge, experience and integrity is key to quality. Because the research is at the exploratory stage the interview questions are based on the researcher's formal knowledge and pre-understanding of the topic. The researcher has gained knowledge during the time she worked at the company (NN) and from literature reviews. The interview guide is a combination of pre-articulated questions which

can be adapted and customized to fit with the interview participants' roles in the company and the interview situation.

3.3.5 Data analysis and approach

Semi- structured life world interview is chosen as one of the data collection methods in the research. The interviews are audio recorded and later transcribed. The advantages of transcribing interviews are to help making a more thorough examination of the recordings as many times as needed. The transcription will be available for secondary analysis if necessary by other researchers and the data can be reused in other ways to support the data analysis (Bryman, 2012, ch. 20).

There are different approaches to analyze qualitative data depending on the methodological approach of the research, for example grounded theory or thematic analysis. Grounded theory is one of the most used framework for analysing data. It is defined by Strauss and Corbin (1998) (as cited in Bryman, 2012, ch.17) as "theory that was derived from data, systematically gathered, and analysed through the research process. In this method, data collection, analysis, and eventual theory stand in close relationship to one another". Grounded theory is an approach to generate theory out of data rather being a theory itself and it is theoretically obtained from pragmatism (Corbin & Strauss, 1990). One of the important components in the method is the change built into the process as it drives the phenomena. The other is the determinism, where actors are completely determined by previously existing causes based on choices they made. Thus, grounded theory is good at uncover hidden meanings in data and determine how actors response in situations, it also seeks patterns in the data and theoretical bounded (Bryman, 2012, ch.24). Coding is one of the processes that is central in grounded theory and helps to find and organize data that is central to the study (Bryman, 2012).

Whilst Thematic analysis (TA) has three main research approaches: inductive, deductive or theory-driven data coding and analysis; an experiential or critical orientation to data; and an essentialist or constructivist theoretical perspective (Braun, Clarke & Terry, 2014). TA can be an essentialist or realist method and is not wedded into any pre-existing theoretical framework but can be used within different theoretical frameworks (Braun & Clarke, 2006). Furthermore, TA can report experiences, meanings and the reality of the participants and search for general statements among categories of data (Braun & Clarke, 2006). According to Myers et al. (2007) many researchers believe that both descriptive and interpretive approaches entail interpretation because the meaning of interviewees are sometimes hidden. Furthermore, the value of qualitative description comes not only from the knowledge of the collected data, but it is a result of meanings and findings in data.

The chosen research approach is pragmatic and the way to identify themes in data is inductive. Induction is the observing method where the researcher tries to find something general about the data (Kvale & Brinkmann, 2015). In the inductive way the identified themes are directly connected to the data without the researcher's assumptions or without trying to fit the themes into a pre-existing coding scheme. This is an emergent strategy and it also means that the identified themes do not follow the interview questions but rather found in the answers and meaning of the participants. With the pragmatic phenomenological approach the researcher aims to report meaning, experience, language and the reality of the interviewees by doing her own interpretation of the data.

For this study, meaning condensation is more suitable when a relatively low level of interpretation is necessary. Other approaches recommended when a higher level of interpretation is required such as grounded theory or hermeneutic phenomenology (Myers & Newman, 2007). To gain complete understanding of the collected data, meaning condensation and hermeneutical meaning interpretation will be used.

3.3.6 Meaning Condensation

This type of analysis was chosen as it comes close to the traditional understanding of knowledge as meaning that is in the text (Kvale & Brinkmann, 2015, ch.12). Meaning condensation analysis can be used for semi-structured life world interviews or audio-recorded talks (Malterud, 2012). First coding of the text will be done followed by meaning condensation. Meaning condensation normally builds on coding and creating a shorter sentence or statement from what the participants said. The method focuses on expressing the participants experience or knowledge rather than exploring the underlying meaning (Malterud, 2012).

Giorgi (1975) (as cited in Malterud, 2012) developed a four steps approach that will be used to analyze the transcription. The four steps method guides the researcher to gain understanding of the meaning of the text.

Step 1. Read the entire text from the bird's- eye perspective to gain understanding of the whole document.

Step 2. After the first read, the researcher already looks for preliminary themes associated with the research topic. Those themes will be basic for further analysis and critical reflection. The researcher reads the text again and starts to highlight "meaning units" which is based on the study focus. Reviewing the transcript in a systematic way to help identifying and organizing data elements to unfold the study question.

Step 3. The researcher goes through the meaning units with the aim to find central themes. The main task is to identify, classify and sort out meaning units that related to the themes. The identified meaning units can be labelled with code or codes to show the connection with the code group. The code names are elaborated from the themes found during the first analysis and changeable if necessary during the process. It is an iterative process and going back and forth in the text is required to gain a deep understanding of the data. Coding is done manually with the help of the computer to mark and highlight text elements and sections to sort the data out. Then the researcher organizes all the meaning units into groups and subgroups with the focus on the study and condenses data to elaborate on the result. Reflection on the meaning units and codes are necessary to keep the focus on the study question.

Step 4. The final step is when the researcher develops descriptions and concepts to create a story and a consistent statement from the condensation of data.

Limitation of the meaning condensation is possible due to the way data is decontextualized. The analysis can result in data and information lost during the multiple steps of data analysis.

3.3.7 Hermeneutical interpretation of the meaning

Hermeneutics is the study of interpretation to gain a valid and common understanding of meaning. Interpretation is the central theme with the aim to understand the meaning in relations to the research question (Kvale & Brinkmann, 2015, ch.3). It has been used to interpret religion, law and literature text, but it is expanded to statements and actions lately. According to Kvale & Brinkmann (2015) interpretation of meaning is seen as a continuous cycle where human beings interpret meaning as a natural part of life and their understanding provided by tradition and historical life (ch.3).

Hermeneutical meaning interpretation goes deep into what is said to the critical interpretation of the text to find the underlying meaning (Kvale & Brinkmann, 2015, ch.12). This approach requires the researcher going back and forth in the text to gain a deeper understanding of meaning. In relation to the interviews conducted in the study, the researcher's first interpretation based on the pre-understanding of the onboarding system at Novo Nordisk which comes from the time she worked at the company. Going back and forth in the text drives the researcher to find new meanings until finding the true meaning. Finding the true meaning will always be questionable based on Kvale & Brinkmann's study (2015) because the researcher influenced by her perspective and subjectivity (ch.12). For example, the researcher only pays attention to meanings that support her opinion or selectively interpreting and reporting (Kvale & Brinkmann, 2015, ch.12). When taking this approach to interviewing, the interpretation of the meaning should be a conscious, systematic process, which at the end ensures the researchers to find the true meaning.

3.3.8 Treatment and analysis of data

The transformation of oral interviews to recorded data and later to a transcript will enable the researcher to analyze the data (Kvale & Brinkmann, 2015, ch.10). The transcribed document will serve as the empirical data of the study where the audio recorded interviews give a possibility to the researcher to return and listen to it again and again as many times as necessary. The audio recording is transcribed word by word to gain a more formal style where repetitions like "mmh", pauses, emotional expressions like laughter will not be transcribed. The transcriptions are following a clear and distinct transcribing method without guessing any of the words to secure the reliability of the transcription (Kvale & Brinkmann, 2015, ch.10).

3.3.9 Ethical issues and participants

Ethical issues need to be considered during the interview and the workshop. Due to the researcher's aim to gain a deep understanding of the topic can create a risk of either being in violation of the interviewees' rights, privacy or this may prevent the researcher from digging deep into the topic (Kvale & Brinkmann, 2015, ch.4; & Bryman, 2012, ch. 6). Therefore, ethical issues must be considered throughout from the start to the end of the research by following ethical guidelines. An informed consent document about the overall purpose of the study, procedures, risks or benefits from participation is shared with the participant (Appendix 3). It also includes confidentiality and explains who get access to the recorded material, how information will be stored, and how issues of conflicts will be handled. Confidentiality must be considered due to access to the collected materials to protect the participant's privacy (Kvale & Brinkmann, 2015, ch.4). The role of the researcher is important and the researcher must follow ethical requirements.

3.3.10 Choosing Interview participants

Several important decisions has to be made when choosing and using participants for the research. According to Bordens & Abbott (2014, ch.4) the important goal of research study is to be able to apply the result to a larger population based on the small sample of interview participants. The interviews seek to discover behaviours, issues, beliefs, practices that represented among the interviewees until the number of interviews sufficient enough to ensure a full coverage of issues (Galvin, 2015). The interviews have to discover saturation of issues that are important to the point when there is no more new information emerge out of the interviews (Galvin, 2015). The researcher decides based on all the issues involved in the research at how many participants necessary to interview (Galvin, 2015). Based on Galvin's (2015) paper the researcher also need to decide how much time to invest into data gathering, the interview format and the technical background in order to minimize bias.

According to Csurgo's (2017) stakeholder analysis in the Designing E-learning Platform for GLIA at Novo Nordisk study (p.11-13), the stakeholders are distinguished between primary, secondary and tertiary stakeholders depending on their job, roles and positions and involvement. In this study the focus is on the secondary stakeholders. Secondary stakeholders are those at NN who do not interact directly with the onboarding and learning system but give input or output to the system. Secondary stakeholders considered directors and managers who are key decision-makers in finance and business or provide technical assistance if necessary to sustain the system. Their influence on the current system is high because of their authority to make decisions with a high interest in the system to help benefit the company and new employees.

While primary stakeholders considered NN employees who are facilitators such as subject experts, designers, instructional designers, administrators and end users. Their involvement is inevitable and high in designing, developing, maintaining, using, and administering the system.

According to Galvin (2015) two interviews required to fulfil the criteria to gain knowledge that is represented in a population and relevant to the research. This is the required minimum number of participants that can give to a minimum degree a statistical confidence to the researcher and her beliefs. In order to discover all the issues the researcher decided to recruit secondary stakeholders a director and a manager, two NN employees who are working in the field of onboarding and e-learning. They considered as decision-makers with a deep knowledge of the current system and a significant influence on the system.

3.4 Data collection

The semi-structured lifeworld interview participants are two male NN employees, who are considered as secondary stakeholders in the study. Their roles and responsibilities is given by NN and strictly follows the company rules and regulations. The only requirements determined by the study researcher towards them are to be working with onboarding and e-learning and they must be decision makers in the field. The full interview transcription and meaning condensation can be found in Appendix 2.

Interview participant 1, Director of Employer Branding and Digital Acceleration with the responsibility for onboarding at Novo Nordisk.

He is the head of Employee Branding and Digital Acceleration, the life-changing career and communication platform with employee value proposition. He is in charge of digital activities tied to talent acquisition where his responsibility ranges from social media, external media and various forums to all of the global career sites. NN has 54 career sites all over the world, where he is responsible for managing and maintaining the recruitment system, onboarding and the candidate management relationship systems.

Analysis of interview 1

The interviewee expresses his view about the current onboarding situation at NN. The current onboarding system Inntro has three stages of onboarding and mainly focuses on the company onboarding where onboarding starts before the new employee enters the company and continues after the first day at work. For the Danish employees in Denmark the company arranges an event where they can meet with patients, hear their stories and meet face to face with the executive management. This has been very successful according to the interviewee. Inntro is basically a website where new employees start company onboarding. The platform is tracking the user's journey to see who is onboarding and to see different website activities. The collected data provide information on when and where users are onboarding, their entry and exit point and how long they stay on the website. All these information will be used to make changes on the platform according to data. The collected data will also be used to redesign the website to provide better user experience if necessary. The data collection activity does not include user feedback. The main focus is to detect trending patterns in the data and observe user behavior on the Inntro website.

The interviewee is concerned with a current onboarding system and he thinks that there is a bigger need "we have some initiatives, but I think we have a bigger need to what we catering right now", specially in the job onboarding area. He also expresses his view on the difficulty to create job onboarding modules due to different job roles and job curriculum at NN. Therefore, NN only provides a platform for the managers to create modules and choose which module the new employee needs, it is in a manner of speaking do-it-yourself and therefore, there is a need for a more flexible system with a personalized content.

Right now NN is trying to build on the recruitment system and tie the onboarding system to that system. They want to do so to provide a much improved and more seamless user experience. For example, when employees will enter personal information in one system, it will appears in the other system as well.

Besides Inntro, NN has two different Learning Management Systems (LMS). One is LearnIT LMS and the other one is ISOtrain LMS. These two platforms serve different purposes and build on different technologies. The interviewee mentions LearnIT as the potential platform to be tied into the onboarding context for a better user experience, however he is concerned the system has flaws that might prevent to fully commit to the system.

According to the interviewee the key challenges with the current onboarding system is in regards to the accountability and responsibility of onboarding. It is not clear who is in charge of onboarding. He thinks NN needs an onboarding partner who helps with the procedure but it is not as mature in the definition in the organizational setup as yet.

The standard procedure of onboarding besides the Inntro website is linked together with other best practices at NN. Having a buddy, meeting with influential people at an event organized by the company and hearing patients' stories are activities that are also part of the onboarding process. The interviewee considers that there is a need for many different ways of learning. However, he is concerned about e-learning due to old and heavy types of content like PDF's or long slides. He believes that there has to be a better fit between the time and the learning applied. He mentions micro-learning as a better match for short-term learning activities and easy application. Micro learning refers to a variety of learning models, concepts and processes. It is ideal in busy working environments and for diverse learning styles. At this moment there is a need for a job curriculum that could be attributed from one employee to the other one, but they have not done it yet due to the diversity of job roles.

Regarding the question about how an ideal e-learning system would look like in relation to onboarding, the interviewee's answer is "I think it is not one system, I think it is a combination of things" and he continues as "it is nice to have a place to go when you start, a stop shop where you have the most important stuff" to find the most important information at the beginning of the employment; it can be a website, and an onboarding day as well. What he sees trending among vendors is creating a heavy-duty suite with performance management, recruitment and onboarding implemented in. Then there are small vendors who create apps for onboarding. Due to the size of NN it is difficult to create one system because it is not just about learning, but

technology and IT and productivity. He believes that a review of the current situation is necessary to design a better targeted solution. He mentions that if Key Performance Indicator (KPI) would be defined by NN it would provide a clearer image of what really matters. Collecting metrics for a baseline would help to gather information before implementing anything new. It is important to understand the background before reinventing anything, he said.

Regarding personalized content the interviewee mentions that people expect more custommade modules, easy to use and intuitive to engage with. Those expectations are based on the new technology or the different applications the new employees have been using in their private life. He is concerned about the amount of information new employees are bombarded with at the beginning. He thinks it is impossible to remember all of it as it was just passing through. Creating better user experience would also be interesting to look into in the future.

According to him, what really matters in regards to onboarding is the accelerated performance, to get the new employee up and running as fast as possible. If the onboarding period can be shortened by a couple of months and the new employee is up and running, then this is beneficial for the company.

Interview participant 2, Product Supply Quality Training and Data Manager at Novo Nordisk.

He is the E-Learning Program Manager for the Good Manufacturing Practice (GMP) training. He is responsible for GMP onboarding and training. This means he works with different areas of NN, one would be Product Supply (PS) where they are governed by good manufacturing practices. He is responsible for onboarding people by a set of e-learnings covering different topics; his responsibility is to keep e-learning modules up-to-date. He also works with requirements in the GMP training from different authorities to continuously train and educate all employees who are working within GMP. His main focus is the creation of e-learning modules every year approximately 30-35 minutes, covering topics chosen by PS management, inspections office, internal audits and Quality Management System (QMS) coordinators across PS. He is involved in Business Consulting on E-Learning and digital learning experiences, mainly videos which are "the New Black" in NN in regards of this type of training. His educational background lays in Project management, Digital learning and instruction design and he also involved in content production and vendor interaction.

Analysis of interview 2

The interviewee mentions that there are two different e-learning LMS systems at NN. He believes that the two LMS: ISOTrain and LearnIT are too confusing for the user, therefore he thinks that a single LMS would be more beneficial. The two different LMS confuse the users about where to go, what kind of learning they would gain in the particular LMS or what these systems are useful for. According to him, the two systems are well defined by NN but the setup still seems an obstacle for the users. The two LMS are satisfying on their own and he is of the opinion that they both have advantages and disadvantages. LearnIT has a lot of potential but there is a lot of technicalities that prolong the period of work. In contrast to ISOTrain, ISOTrain can covers the basics, but is not able to execute different tasks or collect data that is important

for going forward. And because the company is a GMP-regulated company, meaning that Good Manufacturing Practice is to control the authorization and licensing and manufacturing pharmaceutical products, it is important to have a GMP-regulated system. The chosen LMS system has to show that the employee signed up for the training and there is a validation cycle that shows it can be trusted. Choosing the right system has to provide a validation cycle which can be costly, he assumes. Analyzing each system in depth and seeing if they match with the company's goals and requirements along with the usability aspect from the user's perspective and the administrative point of view is equally important.

According to the interviewee, tracking user engagement is possible with both systems, but LearnIT is not a validated system; therefore NN will not be able to use it for its GMP-regulated system. Thus, everything that has to do with e-learning needs to be in ISOTrain LMS. Usually the GMP e-learning materials are very long, it takes between 30 and 40 minutes to review each module and there are seven of them, which means roughly 3,5 hours of materials that new employees have to go through in the first 60 days of employment. The current e-learning setup does not support flexible learning or micro learning as it is linear and users are not able to moving back and forth in the module. He mentions that they are working on a more user-friendly module: instead of 30-minute material, it will be a 7-minute material, and 5 small modules where people can navigate fast around. He believes that this would create a more user-friendly navigation and support flexible learning module depend on the user needs. He says that system will be well received from a logistic point of view, but the module still will be designed to go through at once in a linear way.

According to him, user feedback is not collected based on the fact that the target group is around 16000 employees and harvesting data is difficult, but they do training effective checks. He is part of a training coordinator network in which he discusses different e-learning related topics with other training coordinators and use their input to create better modules.

Personalizing content is not in focus, but he would rather create a module adaptable for a specific topic. He means that users can navigate into the content based on their previous knowledge, but a generic platform for discuss GMP still necessary. He needs to investigate what would be the benefits of personalizing e-learning, but he agrees that the shorter e-learning modules would make sense if users want to learn more about what other colleagues are doing in the company, in order to understand the whole value chain of production for example.

He mentions a forum-like platform where people can discuss GMP. It is more of a pool where users can go and have a discussion if they feel like. Forums or discussion rooms only work with a full-time moderator, but it is out of budget. He mention blended learning as a most favorable learning mode where different content and platforms could give a chance to users to discuss and communicate with each other.

As stated by the interviewee, the content depends on the structure of the design. Previously the focus was on video and text content, but this time they had very little written text. The videos are

usually interviews and animated stories with implemented quizzes and small puzzles to create some interaction and keep users engaged. The reason for focusing more on the video content is to convey a lot of information into it in the given time. The text is mainly subtitles for the video.

For the future he would implement a Virtual Reality tool to train people in a septic working environment or show people who do not work there the experience of behavior in the environment. In the interviewee's opinion people at NN do not understand the full extent of how people work in production and as a global company with 8 different time zones, it would be interesting to show how they work globally. Virtual reality is in infant years he says, therefore it could be risky or expensive to be the first runner implementing the technology, but maybe in two years it will worth to try.

Summary of the two interviews

The aim of the interviews is to gain a deep understanding of the current situation of e-learning onboarding at NN. Both interview participants work with onboarding and e-learning but their field, focus, role and level of involvement are different in nature. However, to gain a comprehensive understanding of the current system it is important to investigate the onboarding situation from different perspectives. Table 1.shows the summary of problem found during the interviews and the requirements that apply to the system. The level of detail in the requirements depend on the scope of the project. Design principles and design solution will be added to show what can be done in order to foster good interaction between technology and humans (Dix et al., 2004, ch 7).

What is the problem	Requirements	Design principles	Design solution	
Current onboarding system is not ideal	Need a better system integrated with recruitment system	The platform should be designed in relation to the context	One system that linked with other systems	
There are two LMS systems for different reasons - confuse users	One LMS for e-learning	simplicity, clarity and findability	Integration of one system with the main LMS	
No user feedback collected in LMS	No requirements towards	Task conformance	Feedback pop up window	
User are not supported for micro- learning	It has to be better match between time and learning in the busy work environment	Familiarity and clarity	information divided into small sections	
Users are not supported for flexible learning environment	Jsers are not supported for lexible learning environment It has to be better match between time and learning in the busy work environment		information divided into small sections	
E-learning system	It has to be more flexible for better user experience	Familiarity and clarity	Clear navigation, simple interface,	
People are bombarded with information	Better user experience	Browsability and consistency	Consistent interface with search option	

Table 1. The summary of problem found during the interviews and the suggested requirements.

The current onboarding situation for the generic onboarding process starts before the new employee enters the company and continue after the first day at work. The system used for the company onboarding is called Inntro which basically is a website, where new employees read information about the company. He is concerned with the onboarding system as he believes that there is a different need to what they have now.

There are two LMS systems that catering e-learning modules at NN, but both serve different purposes and built on different technology.

The second interview participant believes that only one LMS is necessary, as the existence of two parallel systems confuse the users. Based on his responsibility and roles he prefers ISOtrain because the company is GMP-regulated and it is important to have a system that supports this requirement. On the other hand, interviewee 1 would look more into LearnIT as a potential platform to cater e-learning modules which can be tied together with the current onboarding activities.

Both of the interviewees mention that they do not collect user feedback. Interviewee 2 thinks that collecting feedback from 16000 employees and harvesting data is difficult, but they perform a training effective check. Interviewee 1 and his department focusing on collecting feedback on the website activities to see trending data and use the data to fine-tune the website.

Both interviewees agree that the current e-learning system does not support micro-learning or flexible learning environment. They think it has to be a better match between the time and the learning applied for diverse learning styles and the busy working environment. Interviewee 1's conception of the ideal e-learning module can be a combination of things eg. one-stop shop where new employees can find all the necessary information at the beginning of the employment. He believes that e-learning modules have to be more personalized and the e-learning system has to be more flexible for better user experience. For interviewee 2 personalizing content is not in focus, but he would be more interested in an adaptable learning module which means users can navigate into the content based on their prior knowledge and learn only what is necessary.

Discussion rooms and personal meetings are both important during onboarding. However, it is not part of the e-learning but it is equally important for the company and employees. According to interviewee 2, blended learning is the most favourable mode of learning. Besides the general onboarding material, he mentions the idea to create a platform where people can discuss GMP. It could be a forum or a discussion room, where people have a chance to interact with each other. To run a chat room or forum there should be a full-time moderator but that is out of the budget. Interviewee 1 believes there is a need for a different type of learning that would be a better match with different learning styles. Therefore, the standard onboarding procedure has been linked together with other best practices, like having a buddy, meeting influential colleagues during an event or hearing patients stories.

Accelerated performance is the most important goal for interviewee 1. His job is to get new employees up and running in the shortest time possible; the shorter the period, the better it is for the company. Interviewee 2's onboarding program takes 60 days to complete due to the e-learning material. In order to assign the new employees, they have to make sure he or she went through the whole learning material.

In the future, interviewee 2 would implement virtual reality to train people in a septic working environment or use the technology to introduce colleagues to how people work in production. Interviewee 1 would focus on creating a better user experience for the newcomers. He is concerned about the amount of information new employees bombarded with at the beginning. He believes the information is just passed through and impossible to remember.

4. LAB phase - Modelling the new solution

This chapter introduces the LAB Phase in the DBR model. The first section explains the chosen method, the Future Workshop, the second section introduces the data collection and the last part introduces the analysis of the data, the modelling of a solution and the development of a low fidelity prototype.

4.1 Future Workshop

The Future workshop (FW) as a problem-solving method was chosen for this thesis. The method is based on the democratic problem-solving approach and brings together people who all share an interest in a common problem. The method was first developed by the Austrians Jungk and Mullert in 1965. Since then it became a well-known method. The participants of the workshop become co-designers whose involvement help to create a desired solution.

The FW is an instrument for solving problems in collaboration, in workshops and social science studies. The method is good for dealing with complex problems where different views and opinions have to be fitted together. According to Jungk & Müllert, (1987) the most frequently voiced objection to the workshop is the participant's delude. They believe their opinion will not make any difference or never be put into effect. It has been proved by Jungk et al. (1987) that people learn that they can make a difference by joining the decision-making process. The participants gain confidence, become active and their imagination starts to flow. What matters in the workshop is that people come together and collectively search for a solution by discussing with each other and letting their imaginations run wildly (Jungk & Müllert, 1987). One of the critiques of the workshop approach is that everyday people will not be able to understand complex problems or create a good, applicable solution (Jungk & Müllert, 1987). The workshop offers an opportunity for those who wish to express their ideas and want to have an opportunity to change. As Jungk and Mullert (1987) said: "The future belongs to everybody."

In general, the approach of the method is divided into four phases: the preparatory phase and three workshop phases (Jungk & Müllert, 1987).

The preparatory phase aim is to get ready for the workshop. Organizing, planning and managing the workshop is the most crucial part of the method. A conveniently situated location, a cozy, informal and inspirational atmosphere are necessary to secure the success of the research. Materials such as pre-made questions, post-its are provided along with different brainstorming material. Food and beverages also need to be provided. Decide on who to invite, the length of the workshop and start recruiting the right participants. It is recommended to recruit 15 to 25 persons, but not more in order to give a chance to everyone to speak (Jungk & Müllert, 1987). The facilitator's role is important to secure the success of the workshop. The facilitator must insure the phases and she has to be familiar with the sequence of the event.

The first workshop phase is about to criticize the actual situation of the chosen research topic using a brainstorm technique. The objective of the phase is to draw out issues and problems in question. Participants start criticizing the current situation and use a visualized brainstorming technique where they collect critique points regarding the situation. This is a divergent process where activities help to come up with creative ideas to generate new ideas. The main focus is to learn and understand more about the theme, what is negative or positive, or what the participants like or dislike about it. The notes are collected and grouped and ideas combined. The findings are grouped and systematized later and visualized on a whiteboard. This process is the convergent process. The convergent process helps to narrow down possible solutions. At this point all of the ideas are grouped on the whiteboard. It is a great way to have an overview of what has been discussed and found. Next step is to categorize ideas as "to be definitely avoided", "to be avoided", "it cannot be avoided but find a way to deal with it". The convergent and divergent activities have to be in balance to ensure that the participants think creatively but are also able to narrow down to a suitable solution.

The next phase is when participants use their fantasy to come up with as many ideas as possible during the discussion. Here the participants have to go wild with ideas, imagine and communicate their dream scenarios. This phase is also divided into two steps: a divergent and convergent process. During the divergent process participants go further with creating the best scenario without trying to pull already known solutions in. Here the intuitive knowledge is required without restrictions. "Go crazy" and untraditional ideas are preferred. Creative tools such as storytelling are used to help participants in the creative process to help reflect or expand on ideas. The second step is to take the most suitable ideas out and prioritize them after analysis and evaluation.

The final phase is the realization phase, where participants have to organize, analyse and evaluate ideas that help to move from the actual situation towards the preferred one (Jungk & Müllert, 1987). In the phase the ideas need to be seen more from a realistic angle and what is possible to implement. This phase includes several steps. First, all the ideas need to be further discussed to the point where it seems possible to implement them. Next, participants formulate clearly the most promising ideas in form of a map.

This form of research involves active participation from the beginning of the workshop through the end, where participants are encouraged to find answer to their complaints during the workshop.

4.2 Future workshop participants

The aim of the workshop about to be described is to discover all the problems that the participants experienced during onboarding and discuss that in order to produce some kind of solution. Furthermore, the research aims to solve a problem focusing on designing a conceptual e-learning onboarding model that supports professional development in NN.Therefore, the nature of the research requires participants who works for NN with a personal experience of the onboarding and the elearning systems at the beginning of their employment. They have a good understanding of the current system, the issues with the system if there is any, and are willing to express their opinion. Furthermore, the research focuses on participants between ages of 18-29 who are internationals and work in Denmark. Representation of men and women is equal, two men and two women, so the result will not be affected by gender differences. The specific target group, millennials, was chosen due to their special characteristic.They were born and raised in a more digital world and therefore were exposed to and have a better understanding of digital solutions.

Based on the onboarding process at NN, participants have to take different e-learning courses and at the end of the course test their knowledge. Most of these modules are text-heavy and lack interaction or modern technology and the test score at the end places pressure on users. The participants are not expected to deliver a complex solution nor to fully design an onboarding system, but with the help of their involvement, the research can gain a deeper understanding of the phenomenon.

For the FW there are rules to follow when recruiting participants. Recruiting participants was difficult due to busy schedules at NN and the requirements of the FW. Consequences of difficulties with the organisation of the workshop drove the researcher to redesign the workshop to better fit with the participants' busy schedule, but still made sure it follows the rules that provides a result at the end. The researcher discussed the situation with the thesis supervisor and they made a decision based on the theme, the scope and the research method of the project. The workshop takes up three hours to complete and is divided into three phases where the four participants work together in the entire workshop.

4.3 During the workshop

Room layout has to support the creative thinking as conventional setting with rows facing one direction will not support that. The room has to be arranged in a semi-circle way so everyone can get up if they want to draw something to the whiteboard and see each other during discussion (Jungk & Müllert, 1987).

During the entire workshop the four participants work close together. The participants are student assistants who are working and studying at the same time. They are open to discussions and they are used to expressing their opinion. During the critique phase, they

brainstorm about the current situation, what they do not like about the current system. They generate critique points which are written down on colorful post-it notes. Everything that is said goes on post-it notes and is later transferred to the whiteboard so everyone can see what has been discussed.

During the fantasy phase the participants have to overcome their frustration of the system and think how they can change things for the better. They have to unleash their creativity and imagination to rethink problems and seek alternatives. In this phase participants have to be spontaneous and bring up new ideas during brainstorming without judging each others' ideas. Brainstorming helps to move ideas towards to the solution of the workshop problem.

In the implementation phase the participants have to choose between what they would like to see as a solution, what is possible and what is not. The group is working together on the implementation proposal. In the implementation phase, participants start drawing on the whiteboard to explore ideas and erase if necessary. Whiteboard drawing is more convenient as everyone can join in and to support group discussion and learning. It is also easy to see and follow the revelation of the whole idea. The storytelling technique is used to help each other imaging the idea and give a chance to discuss when necessary.

The success of the workshop is based on how comfortable participants feel to express their ideas and how working in group can affect their minds and behaviour (Jungk & Müllert, 1987). According to Jungk & Mullert (1987) at the end of the workshop participants feel empowered, they gained a sense of commitment and discovered that they can create surprising unforeseeable solutions. The workshop is not only a method but it can be seen as a tool turning participants into activists. Find the schedule of the day in Appendix 3.

4.4 Collecting data

The collected data serves the purpose of conceptualizing a solution and is to be analyzed the same way as the interviews. Two types of data are collected. One is an audio recording from the workshop and the other one is photos of the workshop. First the audio-recorded workshop is be transcribed. The transcribed document is treated with meaning condensation and later hermeneutic meaning interpretation. The reason is to gain a valid and common understanding of meaning. Photos are taken of the whiteboard and post-it notes (see Figure 4) to visualize the workshop progress. Photos are only taken from the material in order to protect the participants' privacy. At the end of the workshop, an analysis of the conceptual design proposal should emerge out of the data. The full transcription and meaning condensation can be found in Appendix 4.

4.5 Analysis of the workshop

The following section addresses the second phase of the DBR, the LAB phase when creating a prototype. The purpose of the chapter is to analyse data and to discuss the result of the prototype which was created during the implementation phase. The creation of the prototype

based on the workshop previous phases of the future workshop and the themes participants discussed during the workshop.

4.5.1 Analysis of the critique phase

One of the main topics that was brought up by the participants is the content provided during onboarding. The corporate culture and core values were repeated a lot, however other relevant information based on the newcomers needs, such as abbreviations was missing from the learning module. The information was necessary and would have helped the participants to better understand the rest of the learning content.

The participants felt like it would have helped them to understand the company and company values better if there had been more information about the products produced at NN, as well as information about business areas, functions and manufacturing, etc.

Specific knowledge for students was also missing. It would be preferable to make available an information package that is specific for students from the start.

The length of the learning material was also criticized. The participants agreed that some of the learning material took a whole day to complete. However, even if it was a very long module they felt that enough time was allocated to go through the material.

E-learning modules, which consist of video materials, were also criticized due to their length; moreover, their content was not engaging. This resulted in not remembering the subject matter of the video. One of the participants mentioned that she got an introductory meeting with colleagues, which she enjoyed, but she would have preferred to watch it on video. Participants generally prefer videos when it comes to learning, they also want to have full control over how to watch them with for example the possibility to adjust the speed, to turn off the sound and to read subtitles, or download the text if necessary.

After completing onboarding the participants had the impression that they had missed out on a lot of information that should be included in the starter onboarding package. They started to encounter information that they deemed would be beneficial to include in the onboarding module. They did not know where to look for information and how to find specific information. Therefore, they suggest to create a guide on how and where to find information, as well as a good summary after every learning module in order to easily review essential information.

As a new employee they felt like they were not supported enough when they wanted to learn more about the company. The e-learning modules are not organized in a way that make navigation easy among them. When searching for e-learning modules to gain additional knowledge about the company, they either could not find any specific for their job role, or they did not have access to it. They believe a cultural change is necessary for a better information availability at NN.

The participants mentioned that they were keen on finding more learning material to learn from but they found it impossible. Additionally, they expressed the wish to visit different departments

or functions at the company; virtual reality (VR) tours or video material would work as well to show production. They would like VR content especially about areas they have no access to. When going through onboarding materials, the preferred device to use for leaning is the laptop or PC. They mention that, it is more convenient as every new employee receives a laptop, but not everyone is allocated a mobile phone. They also find mobile phone distracting while learning.



Figure 4. Post-it notes collected during the critique phase by the workshop participants.

4.5.2 Analysis of Fantasy phase

In the fantasy phase participants agreed that VR would create an exciting learning material in opposite to long videos or long and tedious PDFs. VR learning material could be good for production where access is limited (see Figure 5). Participants considered personal meetings or learning through social interactions as a valuable way of learning. They mentioned the one-day event organized for the new Danish speaking employees where they can meet influential people and hear patients' stories; they like the idea to meet face-to-face, however they know it is not

closely related to the e-learning module. They also mention that the event could be livestreamed or recorded in a video format to be easily distributed all over NN.



Figure 5. VR learning material for virtually visiting different NN facilities

Having a quiz or a gamification element in the learning material would encourage participants to get a better result. The participants prefer to see their progress with a pie chart at the end of the learning module with their score presented in it.

Video content was a popular topic among the participants (see Figure 6). They underlined the need for a better way to find relevant videos. According to them, it is impossible to find videos, therefore they suggested that a better overview and better information architecture to support findability should be developed. When watching videos the system does not support any interaction such as going back or fast forwarding, the participants suggest a better control over the videos. They also mentioned that when they started watching a video, they had no idea about its duration nor if the video is interactive or not, how many questions are in the video. They suggest a summary for supporting a better overview.



Figure 6. Video control panel

They prefer a nicer platform for the onboarding system with synchronizing all the LMS in one system. Participants find it confusing that when they open one LMS system, they have to open other LMS systems for different learning modules. When asked how they imagine a platform that would work, they mentioned Coursera and EDx, both Massive Open Online Courses

platforms. They found those platforms user-friendly with a better interface and information architecture where everything is one click away (see Figure 7).

A forum or a place to reach out and ask questions is preferred by the participants. It could be a chat room, a discussion room or a forum. They would prefer to chat with other colleagues if there was a question they need to get an answer to when it is not related to their own roles.

Learning modules are planned and scheduled for the new employees before they enter the company. They are planned in a way that gives enough time for the new employees to complete them, but a little bit of planning is still necessary. The participants would prefer if they could see the schedules in their own calendar. They suggest to synchronize the two different schedules together to help them prepare for the learning module and make sure they allocate enough time to complete it.

Content such as abbreviations came back repeatedly in the discussion between the participants. They feel that a guide is necessary for a newcomer as it is difficult to go through the learning material without knowing any abbreviation or knowing where to find the abbreviation guide.



Figure 7. User Friendly interface

4.5.3 Analysis of Implementation phase

During the implementation phase, participants mention the quiz, as it has an unusual set up according to them. If you miss one answer you have to restart the whole quiz from the beginning, however you can attempt to complete the quiz hundreds of times. They like the quiz as it can give them a good feeling of achievement.

Participants feel that giving feedback is necessary and they would prefer it in a short questionnaire format with two questions. There is no feedback option in the current onboarding e-learning system which would help to improve modules or courses. Participants suggest a popup box where they get a chance to express their opinion.

For the better overview of the module or course, participants suggest to have a front page with every important link and information about it. The front page has to be welcoming with a personalized information on it and a welcome message. It should show the user name. It should have an easy and understandable interface where information is grouped together. According to the participants it creates a better overview, easy accessible information with a simple interface where they can find their way around. They prefer to get information on VR learning courses, who to contact, a link to LearnIT LMS, etc.

They mention a guide that is in electronic format but downloadable as a PDF or Word Doc to help them find information. The guide could include important information for newcomers. They prefer content to be organized and grouped together; in addition to this, they would like to have a module description, a short information about the length of the module, what the course includes, etc.

Showing learning progress is also preferred. They think it is nice to see how far they are in the module, how compliant they are. It is an important feature as it shows their learning progress and achievements.

A task reminder is also referred to in order to show how many modules or courses they have to take in a given period. They mention an option to give access to the manager or buddy to their onboarding profile to receive help from them if they need it during the onboarding. Participants would prefer to have access to a place where newcomers can store questions along the course to their managers. Participants like the progress bar to have a visual feedback on where they are in the process of completing the module, how long that activity will take and that indicate how close they are to completing the course or task. Showing completion of the task is also important. Furthermore, when completing the task or a module they prefer a clear overview of what comes next. A link to other pages or a clear overview of activities they can do is suggested.

A search option is the other important feature participants mention. They mention that searching for information usually provides unsuited results that is not relevant. They would like to have a well-functioning search function with a search bar.

Participants mention that it is good to have important information upfront on the front page so newcomers can see right away and get the feeling of what is NN. The system should also trigger newcomers to take further action based on their interest. It can be some kind of interactive element that provides an opening for taking further action.

The preferred way of choosing content is based on learning styles. They think some of the content is boring or too long in PDF format but can provide a better experience in video format. Sometimes they prefer to read instead of watching a video, or the other way around. They would like to choose the content type according to their preference. The result of the implementation phase can be seen in Figure 8.



Figure 8. Result of the implementation phase

Summary

Based on the future workshop outcome requirements are collected in order to design a system to meet primary stakeholders' needs. Requirements discovery is performed to transform the requests of the workshop participants into a detailed list of what the new system must do to provide the needed value to the business and the users (Dennis, Wixom & Roth, 2014, ch.3; Garrett, 2010, ch. 4). The requirements based on the users' need, what the onboarding system should do and characteristics the system should have (Dennis, Wixom & Roth, 2014, ch.3). The collected requirements are the base for the next phase the design phase (Dennis, Wixom & Roth, 2014, ch.3).

Collecting requirements are an important and necessary step in order to effectively design an onboarding experience (Bentley, Dittman & Whitten, 2007, ch.6). Summary of the requirements can be seen in Table 2.

Functional requirements towards the user interface of the onboarding system
Personalized front page
Welcome message
Easy navigation
Interactive elements

Good user experience

Simple interface

Consistency of user interface	
elements	

User requirements towards user interface elements and different components
Video
Discussion room
Calendar
Quiz
Feedback
Task reminder
Modules and description
Progress bar
Summary of learning modules
Search bar
Settings: Log in and out
Useful information: Operational guide
Nonfunctional requirements

Technical environment:PC/ Laptop
Performance: the system should be available 24/7 and be ready to use by 1000s of users



4.6 Modelling the new solution

The following section will introduce the first low fidelity prototype of the onboarding system. The outcome is a conceptual design of the onboarding system grounded in the literature review, design principles and in the analysis of the research data. The literature review resulted in discovering best practices, the interviews gave a good understanding of the current system and what would be an ideal system, while the output from the future workshop resulted in many proposals which are a good lead for future developments. The result of the data analysis will be

used to discuss how interviewees and workshop participants see the system and how they want to transform the onboarding experience in order to have a well-functioning system. This section includes a mock-up design to help visualize the model of the redesigned onboarding system. The presented mock-up is the first version of the redesigned system that later needs to go through several iterations of evaluations and redesigns until there is no more room for improvement (Dix, A. 2004, ch. 5). Using a low fidelity prototype in the process will help to discover most of the problems without using a lot of resources and give room for improvement according to Dix (2004, ch. 5).

The first section of the prototype can be seen on the drawing below (Figure. 9). The first hand drawings can be seen in Appendix 5. The design choices are based on the workshop participants suggestions, the interviews with secondary stakeholders and best practices discovered through the literature review. The conceptual structure begins to take shape according to the requirements and the front page structure of the onboarding system will be further defined by interface design, information architecture and navigation design (Garrett, 2010, ch. 5).

~ ~ \v (
Welcome to I	SOTrain Eleni!	(a search	Log out
MODULE 1	MODULE 2		
Course 1 Course 2 Course 3	Course 1 Course 2 Course 3 Course 4		You have done 35% percent of
Description: This module includes four courses	Description: This module includes four courses		your training
Due date: 10-11-2018	Due date: 10-12-2018		
Length: 30 min	Length: 345 min	Learn more	Guidance
Quiz: yes	Quiz: yes		
Format: text/video	Format: text/video	Learni I training	Abbreviation guide
START	START	Book a visit to Holbæk	Operational guide
		VR training	Novo Nordisk Student Network
Need help?	Discussion Room		Upcoming events
Reach out to your Buddy or Manager	Here you can reach out to different		FAQ
by sending them a message.	problems and issues.		
Buddy	☆ 1Type 1 disbetes		
Hi, James	comment here	₹ 8 M 7	NOVEMBER 2018
Manager	2. Early diabetes symptoms	28 29 30 4 5 6 11 12 13 18 19 20 25 26 27	31 1 2 3 7 8 9 10 14 15 16 17 21 22 23 24 78 79 30 1
Hi, Karen			Sync
send	Start a discussion Search for more topics		0)10

Figure 9. The front page of the prototype

Good information architecture (IA) has three components: the user, the context and the content (Morville, Rosenfeld & Arango, 2015, ch 2). The information ecology of IA composed of users, context and content are part of the dynamic and complex system where diversity of users and variety of content along with the context influence the IA design (Morville, Rosenfeld & Arango, 2015, chapter 2).

The context corresponds to the context phase in DBR model where the business domain was investigated. To clarify the first phase of the DBR model literature review and stakeholder interviews were collected.

The content is defined as documents and applications, images or videos that people need to use and find. The findability of information and usability is equally important in the content. Users who are using the system have needs, concerns and their involvement is important to investigate as they can judge the system (Morville, Rosenfeld & Arango, 2015, ch 2). Differences between users can translate into different information needs and information seeking behaviour that is important to investigate.

Front page

Organizing the content on the front page is necessary in a way that help users perceive and understand information (Morville, Rosenfeld & Arango, 2015, ch 4). Users got used to using technology with an interface that is easy to use and intuitive and the information structure tend to be similar on those competing sites to the onboarding system (Morville, Rosenfeld & Arango, 2015, ch 4). They expect the same experience when using different product or technology. They know how they should interact with the product and what they can expect in return. Therefore, organizing and categorizing the information on the page is important in order to make sense for the users (Morville, Rosenfeld & Arango, 2015, ch 6).

The local navigation system is implemented into the front page that enable users to explore the immediate area (Morville, Rosenfeld & Arango, 2015, ch 8). The local navigation system often provides access to a limited subset of information that is particular to a subject or a theme. The different components on the front page sometimes belongs to different groups of people who are responsible for maintaining the section in large organizations (Morville, Rosenfeld & Arango, 2015, ch 8).

Labeling information on the page present an information behind. Due to the big amount of information, the label corresponds to the categorization of the presented information (Morville, Rosenfeld & Arango, 2015, ch 7). According to Morville, Rosenfeld & Arango (2015) labels are the most obvious way to show the organization and navigation schemes to the user. The labels have to speak the same language as the users to minimize confusion (Morville, Rosenfeld & Arango, 2015, ch 8). Contextual links and headings were used in the prototype. Contextual links are hyperlinks which take the user to another page or location by clicking on them, while the heading describes the content that follows them (Morville, Rosenfeld & Arango, 2015, ch 8).

The created prototype's aim is to onboard new users into NN. The front page is divided into sections to support simple interface, easy navigation and findable information on the page. The clarity of the interface helps users to recognize what the page is about, helps them find information on it and drives them to take further actions. Simple design elements follows consistency, where elements behaving in the same manner look the same. The screen elements are organized in a way that helps users understand the interface.

The prototype shows the front page with a personalized profile and personalized message to the newcomer. The front page contains the most important and useful information that would give an opportunity for the newcomers to learn about the company and settle in their role as fast as possible. The downloadable operational guide and useful information section are added to the front page.

Until now the interface of the front page is very basic without any personalized information on it. No information nor having information that would help newcomers to settle in their roles. To fulfil the wish of the workshop participants the interface of the front page is simple, with only necessary information and elements with clear labeling and language is designed.

Content on the front page of the onboarding system includes a welcome message with a personalized title; a description of the page; it shows the different modules with detailed information on them; there is a get help section; a discussion room section; a progress pie chart; a learn more section; a guidance section; a calendar; settings; reminder and the search bar. All these features were collected during the interviews and the future workshop.

Video components

Video content was a popular topic among the participants (Figure 10). The feedback based on the fact that when participants were watching videos during onboarding the system did not support any interaction between the video control and the user. The control panel does not support going back and forth or fast forwarding, therefore the participants suggest a better control over the videos. When a user starts a video, the video appears on the right side of the page. The figure shows how the control panel should be with all the control buttons added to the video control panel. Besides having a full control over the video, the participants would like to have a description of the course, the duration of the video, an indication of if the video contains a quiz element or if it is interactive or not, have subtitles or not. After every single module workshop participants suggest a summary that should be a condensed version of the course that can be used for supporting a better overview or different learning needs.



Figure 10. Video component

Discussion room

Discussion rooms were found to be important for both the workshop participants and the interview participants. The discussion room can be a place where employees can come and search for topics based on their interest or start a conversation according to their need for information. Different topics can be found there which are listed according to the date they were posted. The popularity or engagement level also can be seen with a little arrow indicator, if the topic is becoming popular or not. Everyone who joins can start a conversation or search for topics. Since the discussion room component is placed on the onboarding module, those who have access to it are only the persons responsible to maintain the module or are subject experts in different topics, have previously created a topic or onboarding. The discussion room gives a space where people have a chance to interact with each other. No moderator is involved, so nice conversation and tone is expected from the users. The group members can not only interact but learn from each other in this way. The concept is called community of practice where group members share concerns and passion for something they are interested in and want to learn to do it better (Wenger, 1998). The concept was introduced by Etienne Wenger and Jean Lave in the book Situated Learning (1991). The members share common interest in a topic and are

willing to express their opinion to discuss, share information and help each other. The shared information can be stories, tools, topics of interest. The discussion room members are not in closed group settings but part of the big organization, the company. The group members' profiles are diverse in terms of skills and knowledge and come together to create a new knowledge in an informal learning setting.



Figure 11. Discussion room

Feedback

Participants prefer to give and get feedback. The preferred way for giving feedback would be a short questionnaire, perhaps with two questions. Right now there is no feedback option in the current onboarding e-learning system. Participants suggest a pop-up box where they get a chance to express their opinion (Figure 12). After finishing the module the feedback window pops up automatically. The collected feedback could help the employees responsible for onboarding to see if there is room for improvement. Actively listening to the users and implementing a user feedback would help to improve the page for a better user experience.

You are done with Modul 1.	
Rate your experience	
\odot	
Chose topic	
Experience 🗸	
Share your opinion	
I like	
Submit	

Figure 12. Feedback

Calendar

The modules are scheduled even before the new employee enter the company. It is part of the manager's role to set up the necessary learning material for the newcomers. The learning material normally stretches out into a three-month period or even longer. To remember the exact deadline for the course is difficult due to the stretched time schedule, therefore participants would prefer if they could see the schedules in their own calendar. They suggest to synchronize the two different calendars together to help them see when they have to take the next exam. The calendar has a synchronize button which automatically sync all the dates that appear in the onboarding calendar.

•			NOVEMBE	R 2018			►
S	М	T	W	T	F	S	
				1	2	3	
4	5	6	7	8	9	10	
11	12	13	14	15	16	17	
18	19	20	21	22	23	24	
25	26	27	28	29	30	1	
2	1	4	5		7		
							VDO
						3	ync

Figure 13. Calendar

Task reminder

A visual symbol of task reminder placed on the right top corner of the page. It is grouped together with other important features. It is simply done in order to catch the attention about upcoming events, deadlines or received messages.

Modules and description

The participants mentioned that learning modules are long, some of them took a whole day to get through. Participants prefer to see what the module consists of. The description of the module should include a detailed information about how many courses the module consists of, when is the deadline for completion, the length of the module and if the module has a quiz element or what format is the content. All this in order to provide a better user experience on the page. It would greatly help the new employees to plan their onboarding activity according to the time they have.

MODULE 1	MODULE 2
Course 1 🗸	Course 1
Course 2	Course 2
Course 3	Course 3
Course 4	Course 4
Description:	Description:
This module includes	This module includes
four courses	four courses
Due date: 10-11-2018	Due date: 10-12-2018
Length: 30 min	Length: 345 min
Quiz: yes	Quiz: yes
Format: text/video	Format: text/video
START	START

Figure 14. Modules and descriptions

Search bar

People are searching for information constantly, therefore, it is crucial to design an IA that meets user needs. The search bar was requested by the workshop participants due to their previous experience for searching for information was disappointing as the search produced no result or different result then they looked for.

There are different types of information needs: the know-item seeking when they know where to find information; exploratory seeking, when the user is not sure what he or she is looking for; exhaustive search, when the user is looking for a specific topic with all the details and finally refinding when the user tries to find the information he or she has found already (Morville, Rosenfeld & Arango, 2015, ch 3).

The workshop participants wish to have a Google-like search engine that result in the wished information, instead of going through many iterations to find the right information.

Learn more and Guidance

Organization of information environment is a determining factor to the way information is found and understood (Morville, Rosenfeld & Arango, 2015, ch 6). The labels of categories play a significant role in finding the right information and define the content of these categories. Ambiguous organizational schemes are used to divide information into categories. The content in the two components: Learn More and Guidance grouped together in a meaningful way that is useful when people do not know the exact name of the label (Figure 15). The grouping of related items supports the learning process where the users can make new connections and find the right information (Morville, Rosenfeld & Arango, 2015, ch 6).



Figure 15. Learn more and Guidance

The organization scheme is based on the subject: Learn more and Guidance (Morville, Rosenfeld & Arango, 2015, ch 6). The Learn More section is in regards to learning material that can be useful for newcomers while Guidance is meant to help with useful links and extra information to help newcomers finding their way around in the company. In both of the containers the items are hyperlinks; when users click on a link it takes them to another page where they can read the chosen information or book a visit. The structure and order of the links in both containers follow the hierarchy of importance and the topical organization scheme, not so much of an alphabetical order. To make sure the list of links is understandable for the users, rigorous user testing is essential (Morville, Rosenfeld & Arango, 2015, ch 6). In most cases classifying new items and modifying the list is necessary to reflect on industry changes (Morville, Rosenfeld & Arango, 2015, ch 6).

Progress bar

The users wish to have a progress bar implemented into the e-learning course (Figure 16.). The goal of the progress bar is to provide feedback to the user about what is happening with the system. Anytime they are waiting for a file to download or a process to complete they prefer to see their progress. It indicates the time they have spend or the time they have to wait to get the result (Nielsen Norman Group, 2014). By giving feedback on the progress the interface insures that the user understands that their input is processing.

MODULE 1
Course 1
Course 2
Course 3
Course 4
Description:
This module includes
four courses
Due date: 10-11-2018
Length: 30 min
Quiz: yes
Format: text/video
START Watch video Download text

Figure 16. Progress bar

Need Help

The help section is for the newcomers to be able to reach out to the buddy or the manager in case of a question or a need for assistance. They have access to the newcomers' onboarding page and are able to monitor the activities closely. When the newcomer has questions or wants to discuss a topic, he or she can send a message either to the buddy or the manager. The messaging system is linked together with the mentioned email address so they get a notification when a message arrives. The interface is simple and easy to understand.

Need help?	
Reach out to your Buddy or Manager by sending them a message.	
Buddy	
Hi, James	
	send
Manager	
Hi, Karen	
	send

Figure 17. Get help

5. Limitations of the study

The scope was the main limitation of the thesis. Due to the number of research participants, two interviews and four future workshop participants, the results cannot be generalized. That means the gained knowledge through data collection cannot necessarily be transferred to a similar research.

The participants, four student assistants at NN, took part in the workshop. They were selected to participate in order to fulfill the special criteria of the study. Before the day of the workshop they received an email explaining the workshop as a method, what was expected from them during the different phases and the time schedule.

In the criticizing phase participants started discussing the current situation, what they like or dislike. The researcher tried to drive the direction of the conversation to a more critical approach to the problems but the participants' focus was more on what they liked and very little is stated about what they did not like about the onboarding system. Participants generally agreed with each other about what is good instead of discussing what is not good. During the fantasy phase participants worked on organizing the post-it notes on the whiteboard and tried to expand on the ideas. They also used storytelling to express situations that they have experienced during onboarding. Moreover, participants still discussed what they liked without positively engaging in a creative thinking process. There was one person in the group whose way of thinking seemed "conservative" and it might have influenced other participants. The participant's reasoning was based on the fact that if there were fun elements implemented in the learning materials, learning would be pushed out of balance. According to the participant:

"if you adopt or implement more fun aspects of the learning, it could count to the purpose a little bit by moving the whole idea about learning. It is important to prioritize that there are the certain thing we need to understand at the end of the learning. If it is really fun or interactive, you might risk at pushing it out of balance. The scope might not be as clear, or the end goal, it is very elusive and blurry".

The workshop facilitator found it difficult to deal with this type of person who rather kept his ideas to what is normal during the fantasy phase.

During the Implantation phase participants worked on creating the whole system by using the pre-organized post-it notes. It helped them remember all the features they prefer to have in the onboarding e-learning system. Participants worked close together and discussed every single step they took.

Based on the workshop experience the researcher thinks that the workshop's results could have been different if the original method had been fully implemented. The reduced number of participants and shorter time schedule affected the discussion during the phases and outcome of the workshop. The researcher thinks the participants either did not have time to loosen up to the task, the task was too big for the scheduled time, or they kept their opinion on a minimum level, which means that they might not have shared every problem they faced during onboarding. The workshop phases were not fully utilized and topics were not fully discussed. Based on the experience, during the workshop it might have been more beneficial if the participants had focused more on creating scenarios during the fantasy phase rather than discussing. The visual presentation of the ideas could have triggered a better understanding among them and encouraged them to get engaged.

The diversity of a bigger group of participants would have provided a different result. There is a chance to have more creative or more active people in the bigger group who is willing to share more ideas. The researcher had to get engaged during the workshop to keep the flow running. However, the original workshop method was not fully implemented, the result of the workshop is considered relevant based on the four participants' ideas and participation.

6. Discussion

The aim of this thesis was to investigate how the current onboarding system at NN and to redesign the system based on the end-users' needs. The topic was chosen based on the researcher's interest by the time she was working at the company. Qualitative research approach was chosen based on its exploratory characteristic to gain an understanding of underlying reasons, opinions, and motivations about the e-learning activities during onboarding. The chosen research's approach helped to learn more about the problem that was used to develop an idea as the result of the research.

One of the characteristics of the qualitative research is that it helps uncover trends and opinions and drive deep into the problem. During the literature review a vast of research has been found that helped position and understand the current situation about the research topic. Semistructured interviews and future workshop were the main data collection methods that helped to learn more about the stakeholders' idea about the current system and what the ideal system should be.

The chosen research approach is a design research that can be located within the pragmatic grounds. As Godkhul states (2012) pragmatism has influenced the research with its action, intervention and constructive knowledge where understanding the perspective arises out of situations and consequences. Pragmatism considered a mixed method approach but it was used in the study due to the fact that it can also be used successfully in a qualitative study where the chosen method matches the research question with the purpose of the study (Mackenzie & Knipe, 2006).

Pragmatism was paired with a phenomenological approach in order to learn about the research participants' experience. The phenomenological approach's emphasizes the experience of the research participants, which can be a complex concept due to their different perspectives or understanding of the topic (Englander, 2012). The user involvement and experience giving an understanding of the problem are the essence of identifying needs. It is necessary to mention

that to keep subjectivity during the research was challenging for the researcher because the research findings can be influenced by the researcher's opinion or prior knowledge or what is important or relevant. With the epistemological approach the user experience and user involvement are the essence of understanding the problem. Without the user involvement, it would be difficult if not impossible to investigate what the user needs in order to design a right onboarding system for them.

The empirical result of the data collection and the results of the literature review can be seen as overlapping, because of NN and its current onboarding system is consistent with the best practices and trends found in the literature review. However, there is still place to improve based on the workshop participants' feedback.

DBR was chosen to drive the design development and structure the design process. The model has an iterative nature where knowledge arises in every integrations. The model consist of four phases but in the thesis work the researcher only used the first two phase the Context and the LAB phase. Due to the participant's busy schedule the Intervention and Reflection phase was not adopted. However, to fully exploit the DBR method the prototype has to go through interactions. The process would follow iterative fashion: testing, evaluating, analyzing and redesigning until it fully satisfy the users and their needs.

As mentioned in the Limitation section the scope was the main limitation of the thesis. Due to small number of research participants the results cannot be generalized. The result of the future workshop could have been different if the workshop method was used in full capacity. The diversity of a bigger group of participants would have provided a different result along with a time provided for the workshop.

7. Conclusion

The conclusion of the thesis work will contribute to the knowledge about the e-leaning activities during onboarding at NN and knowledge about applying user-centered method to redesign a current system.

The question of the problem statement is the following:

How to create a conceptual model for a corporate learning environment to support the onboarding process into a personalized learning experience on a global scale?

In order to create a conceptual model for the onboarding system the redesign of the platform was necessary. Users with international background were selected in order to secure the model's intention of using it on a global scale. With the help of the participant's through the usercentered approach the model was designed in order to support personalized leaning experience. Here the personalized experience focus is on the welcoming page, where users can see a personalized message and their name throughout the e-Learning platform. Furthermore, according to the learning preference the users have a chance to choose the type of content they prefer either text or video based and the content divided into smaller sections to support micro-learning.

The following research questions will help to answer the problem statement:

1. How to maximize the eLearning-onboarding ecosystem that supports personalized learning experience for new employees?

To maximize the eco system of the onboarding process, the system has to be synchronized together with a two different LMS systems. In the design proposal the users indicated that INNtro and ISOtrain LMS need to be in one platform due to the importance of them. These two systems have been frequently used by the newcomers. INNtro and its different sessions are web based but has to be linked together with the main onboarding system that is placed on the ISOtrain LMS.

The third system, LearnIT can be an addition to the "learn more" section where the users can freely chose to use it or not. The new eco system provide a better overview and a structured interface where users are able to find information according to their learning needs.

2. How can end users' needs be met and addressed effectively for a Global audience?

To answer this question the research recruited participant with international background to design a solution that could be a good fit a global audience. The participants were millennials who relocated to Denmark for work and study. They background were diverse, language, age and sex were also divers. According to the data collected during the workshop their learning preference end learning style were very similar if not the same.

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