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DATA DRIVEN DECISION MAKING IN RECRUITMENT

Master's thesis

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I declare that I have compiled the paper independently
and all works, important standpoints and data by other authors
have been properly referenced and the same paper
has not been previously been presented for grading.
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ABSTRACT

Many business functions are using data driven decision making to improve their performance. Recently recruitment has followed the same footsteps and slowly but surely many organisations are becoming more data driven in their recruitment processes as well.

The aim of the master thesis is to understand how Estonian startups and companies, who are using data driven decision-making approach, have improved their results while tracking and analysing metrics during recruitment process.

Qualitative research with semi-structured interviews is conducted to get answers to the research question: how data driven decision making has helped recruiters to make their processes more efficient. The interviews are analysed with content and cross-case analysis on the basis of recruitment process steps that are outlined at the end of the theory part.

The main finding is that companies, who have made data driven decision making their recruitment strategy, have made improvements in their recruitment processes. The most tracked recruitment step is creating job advertisement and choosing channels. The main metric measured there is source of candidates as finding great candidates is a common pain point for the companies. Yet most significant examples of improvement come from tracking candidate pipeline conversion metric in the interview stage. Successful tracking and analysis have lead companies to hire better quality candidates many times faster.

As a conclusion, it can be said that companies who have taken more systematic and strategic approach to data driven decision making in recruitment, show great improvements in their processes. It is suggested for other companies to follow this approach to become more efficient in recruitment.

Keywords: data driven, metrics, recruitment, lean

INTRODUCTION

Data driven or evidence-based decision making has affected many different fields from private enterprises to medicine (Baba, HakemZadeh 2012) to even education (Mandinach 2012) and within these fields different professions as well. Recruitment as a function has changed in non-traditional companies. For example, recruitment is one of the core functions in startups, while it used to be a support function to traditional companies. That means more responsibility and bigger workload for recruitment team. To succeed in it, it is important to make the recruitment processes as efficient as possible. Applying lean principles to recruitment is one way of doing it.

The aim of this thesis is to understand how data driven decision making can be beneficial for HR and more precisely for recruitment. It has been argued, that overall HR should move towards data driven decision making to be competitive (e.g. Rousseau, Barends 2011; Van der Togt, Rasmussen 2017; Marler, Fisher 2013).

Recruitment uses and handles a lot of data every day. The current thesis will be looking into what can be defined as recruitment data, for example, data related to identifying hiring needs, interview process, candidate feedback surveys and data relating to job postings and so on. To stay competitive in the job market, organizations need to start utilising the information that is in recruiters' hands and make the best use out of it. Using the data correctly allows recruiters and the whole organisation to make a better decision. For example where to post a job, what to improve in the hiring process to have a better and faster success rate for filling a position, how to improve planning process etc.

As data driven decision making has become widely discussed and based on author's personal experience, it is becoming more popular among companies in Estonia, then the topic seemed relevant to look into. At the moment, there have not been any studies on data driven recruitment in Estonia.

This thesis is going deeper into recruitment decision making in different steps within recruitment process and tries to understand how data driven decision making helps high growth companies in Estonia to recruit better.

The research question that the author is looking to get an answer to is how data driven decision making has helped recruiters to make their processes more efficient. To get the answer, exploratory qualitative research was conducted with content and cross-case analysis. 12 Estonian companies were interviewed for this research. As an outcome of the thesis, a recruitment process is outlined together with metrics that can be measured in each step. Also, practical knowledge and best practices are brought out.

In the first part of the thesis, a theoretical framework of data driven evolution is described. Firstly, it gives an overview of the history of how data driven approach has evolved including related concepts like lean manufacturing and lean startups. This leads to recruitment processes and how to use data in recruitment to become more efficient. The second part of the thesis concentrates on the research. At first, the methodology is laid out, including forming the sample group and course of the research as well as analysis methods. Secondly, the research outcomes are presented. The third part of the thesis consists of the results and discussions.

1. THEORETICAL OVERVIEW

1.1. Background

1.1.1. History

To understand what it means to be data driven, it is important first to understand how being data driven began and had evolved.

Using data to make better business decisions has been around for more than a century by now. At first, this approach was used in manufacturing industries, such as automobile and steel.

Even though data driven sounds like a relatively new concept, then actually companies have been data driven for a long time. Starting from Taylor in the 1880s and continuing with companies like Toyota in 1960s invented just-in-time manufacturing based on using data to understand exactly when something was needed. And companies like GE started using six sigma in the 1980s which puts data front-and-centre.

Frederick Taylor is known as one of the pioneers to try and tie science with processes as well as management to improve economic efficiency. When Taylor was a foreman, he noticed that workers tried to do as little as possible during their working hours. He was the one who suggested that work should be divided into smaller tasks and introduced "A Piece-Rate System" to motivate workers to work more in a given time and that managers should be the ones overlooking the job done. (Scientific… 2009) Taylor has contributed to being data driven by introducing measurable goals into management that helps maximising the work efficiency.

After Taylor introduced scientific management to manufacturing, there have been many followers for this idea; the next significant one was Just In Time manufacturing. In 1960s Japan, Toyota implemented Just In Time (JIT) production with the help of Taichi Ohno, Kiichiro Doyota and Shigeo Shingo. It was first called Toyota Production System (TPS) (Ramnath et al. 2009, 13). JIT focuses on changing the manufacturing process step by step to make the manufacturing faster and

smoothen the flow of materials from suppliers to customers. Like Cheng and Podolsky mentioned (1996) "Just-In-Time (JIT) manufacturing is a Japanese management philosophy applied in manufacturing which involves having the right items of the right quality and quantity in the right place and the right time". Ever since Toyota started using JIT production model, it has become fairly popular approach among other companies as well.

The contribution of JIT in data driven approach lies in the fact that data was used to eliminate waste and unnecessary tasks so as to increase efficiency and add value. For example, there was no need for storing materials and products in warehouses because nothing was produced without customers' needs. This meant that no materials were ordered before an order was placed by the client and as soon as the product was ready, it was shipped to the customer. This reduced the warehousing and transportation costs as well as the need to pay extra workforce to carry out these tasks.

Another example that companies have been using data for a long time now to make their processes more effective is an example of Motorola. Bill Smith introduced Six Sigma approach to General Electric (GE) in the 1980s. "Six Sigma is a comprehensive and flexible system for achieving, sustaining and maximizing business success ... is uniquely driven by close understanding of customer needs, disciplined use of facts, data, and statistical analysis, and diligent attention to managing, improving, and reinventing business processes." (Pande et al. 2000, 11)
Six sigma added to data driven approach by using and analysing data and understanding customer needs to improve processes.

In 1990s Lean Manufacturing became a popular management philosophy which originates from JIT (Womack et al. 1990). The meaning of lean and JIT is the same and is focusing on eliminating waste. (*Ibid.,* 91, 141)

Hallgreen and Olhager (2009) as well as Olesen and others (2015) noted that Womack and Jones (1996) mentioned five lean principles: value, the value stream, flow, pull, and perfection, described in Figure 1:
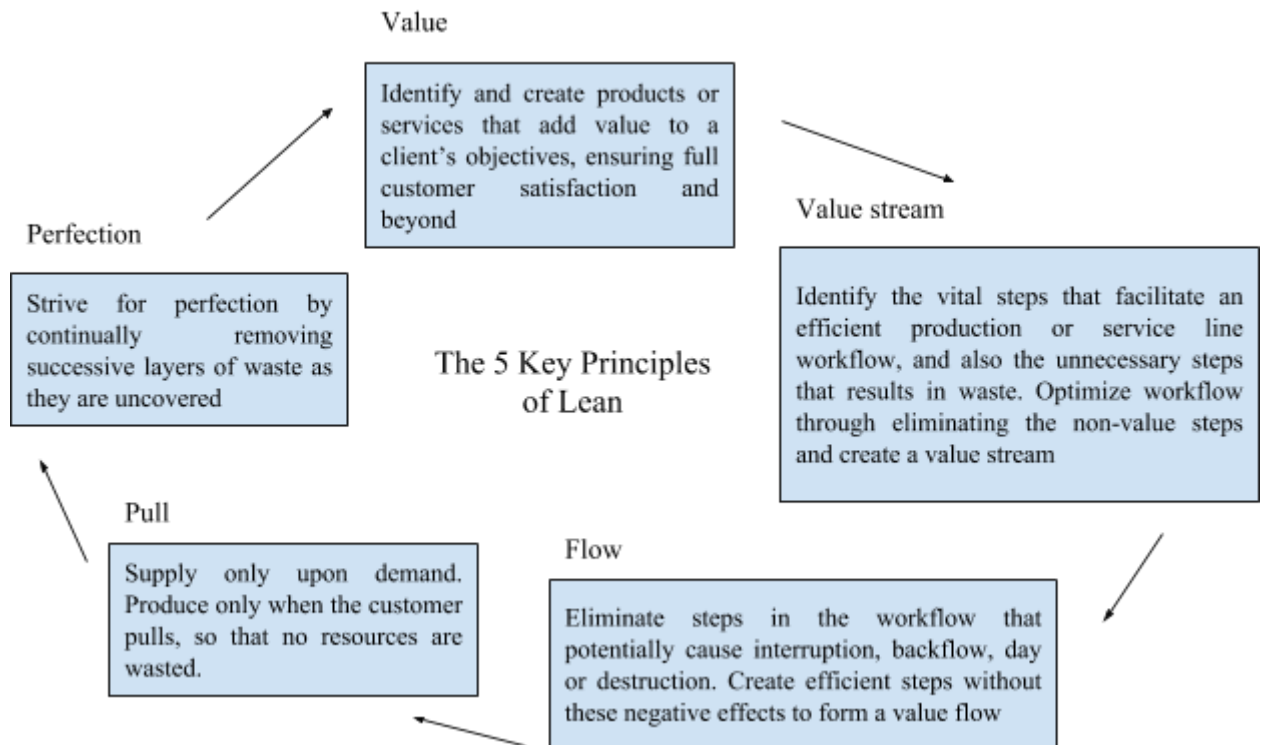
Figure 1. Lean Principles
Source: Olesen et al. (2015)

All in all, even though data driven decision making has been mentioned in studies and articles only recently, companies have been using data to make their processes more effective as described above in the example of JIT, Six Sigma and Lean Manufacturing.

1.1.2. Traditional organisations vs Startups

Organisations have changed, and this part of the theory brings out the differences between traditional organisations and startups. It is relevant because the research part is focusing mostly on startups.

Traditionally organisations had to be established and making a profit to survive and be successful businesses. Nowadays, especially with digitalisation and new emerging technologies, the form of organisations have changed. Entrepreneurs can start their organisations with no money and ask venture capitalists to invest in their newly formed startups. Startups can become successful even if no profit has been made within the first years of operation. According to a definition by Steve Blank, who is a Silicon Valley serial-entrepreneur and academician (2010), "A startup is an organization formed to search for a repeatable and scalable business model". In a startup stage,

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entrepreneurs validate their ideas and might even change them in a search for a sustainable business model which later on will be changed into sustainable businesses. (Spender at al. 2017) One of the main differences between traditional business and a startup is that traditional companies operate according to their business model while the startup is operating to find it's business model (Blank 2013).

Traditionally, one of the main tasks for managers of organisations has been making decisions. Often though due to the time pressure and too little information available, managers make decisions based on their intuition or previous experience. Those blindly made decisions may cause harm to organisations due to waste of resources and can even badly influence the future of the business. (Pfeffer, Sutton 2006 referenced in Baba and HakemZadeh 2012, 832)

Together with changes in organisations, there have been changes in organisational structure. For example, compared with traditional organisations' hierarchical structure, it is becoming more popular that young companies and startups have a flat structure. As mentioned by Powell (2002), many companies have shifted their direction from hierarchical structures toward flat company structure with a benefit of faster decision making, bigger employee empowerment and better teamwork. In companies with a flat structure, not only managers, but their subordinates need to make decisions in their everyday job. Thus, frameworks, that can lead people who do not have a particularly long experience in the field to make better choices, prove to be useful.

As a result of the changes in organisations, decision making has been changed as well. Not only managers have the right and obligation to make business decisions, but also everyone in the company.

1.2. Data driven decision making

In the previous section, the historical evolution of data driven approach was examined as well as the changes in organisations. This part is looking more deeply into data driven approach today and how it can be beneficial for organisational success. Many case studies have been brought out to support the theory.

Some academics use the term data driven decision making (e.g. Mandinach 2012), others call it evidence-based decision making (e.g. Rousseau, Barends 2011; Baba, HakemZadeh 2012). All in all, it means the same thing - using evidence and data together with critical thinking in order to make the best decision possible, not only use one's gut feeling.

Many authors have argued that evidence-based or data driven decision making in today's business is needed to guide the company to the right direction and keep the competitive edge (e.g Baba, HakemZadeh 2012; Mandinach E. B., 2012). Data driven decision making is an approach that tries to improve the quality of decisions made by using systematic and external research (Rousseau 2006, referenced in Baba, HakemZadeh 2012, 837). On the other hand, some authors (Reay et al. 2009 referenced in Baba, HakemZadeh 2012, 837; Rasmussen, Ulrich 2015) argued that there is no evidence, that better decisions are made due to data driven decision making approach. Yet, today there have been many types of research that prove the positive results of data driven approach (e.g. PwC's … 2017).

1.2.1. Data science and big data

Data driven decision making term comes from data science. The term "science" implies that knowledge comes from systematic study. Data Science focuses besides regular data also on statistics, a systematic study on organisations and analysis of data role on implications. The reason, why it is called data science, not statistics, is that the data analysed consists of many different "raw materials", structured and unstructured. For example text, images, videos, which needs to be combined to analyse them. Since data science has become more important in these days, it is important that organisational managers shift more into data driven decision making to replace obsolete practices to be competitive in this data ruled world. (Dhar 2013, 64 - 70) Data driven is often defined as something that is based on data and facts instead of intuition or personal experience (McAfee, Brynjolfsson 2012; Rasmussen, Ulrich 2015).

Being data driven by using big data plays an important role in the success stories of many companies. Even though HR does not have big data to analyse, then HR data has many similarities with big data, and that is why it has been looked into.

As described by Sagiroglu and Sinanc (2013) "Big data is a term for massive data sets having large, more varied and complex structure with the difficulties of storing, analyzing and visualizing for further processes or results."

With the support of the right technology and sufficient skills, organizations can benefit from big data's most prominent characteristics, i.e. its velocity, volume and variety. The analysis of streaming data allows organizations to take immediate actions, adapt business processes and improve customer experiences (Watson, Marjanovic 2013; Intezari, Gressel 2017, 73)

Coming back to the three big data characteristics.

Velocity does not only mean how fast data is reached and stored but also how fast it has been analysed. The faster data is being reached as well as analysed, the bigger competitive advantage can be. The data received shows the situation of the current moment, so it needs to be utilized as soon as possible because not too much later, the situation under attention might be totally different. (e.g., Sagiroglu, Sinanc 2013; McAfee, Brynjolfsson 2012; Zikopoulos et al. 2012, 3-8)

Volume of data has exponentially increased, for example, these days every second adds more data to the internet than was created all together until 1992. Of course, not all the data is useful and needed, but the selection process is difficult. (*Ibid.*)

Variety of big-data consists of traditional structured data as well as raw semi- or unstructured data. Many streams of data have just recently appeared with the development of technology like mobile devices. (*Ibid.*)

HR data is similar to big data in regards to variety and velocity. However, volume wise HR does not process millions of sets of data each day. HR is dealing with data that comes in different forms and from many different channels. Hence, it is difficult to store it in one place and analyse it. Academics keep suggesting that to keep a competitive edge in this everchanging digital era, companies have to change the way they do business (e.g. Loebbecke, Picot 2015; Mandinach 2012; Rousseau, Barends 2011; Sorescu 2017 etc.).

Think With Google website has published many useful case studies and ideas about how to make data work for all companies. For example, in December 2016, an article was written called "3 tips to make your data work harder" where a case study was described. It was discussed that all businesses have access to data and it is a huge asset for all. However, only those who use data to make better business decisions, biggest business growth is guaranteed. There are three important factors when managing data: accumulate and integrate, understand what insights really matter and turn data into action. For example, old insurance company, Progressive, started using data, which was a difficult task as the data was coming in from different sources, was stored in different places

and formats and therefore hard to manage. However, Progressive managed to gather, integrate and secure the data correctly and together with using analytical tools it has managed to get good information on how to improve customer experience and save the brand as well as save money and time for their customers. (3 tips … 2016)

It was noted that companies, who use right tools to find the useful data from all data available, are being successful. For example, Progressive used Google analytics to identify themes and patterns. When Progressive launched their mobile app that offered users to only get a quote at first, then analysing the data of user behaviour it showed that users wanted to buy insurance straight from the app, so they added in-App purchasing opportunity. So it is important to use the right tools to analyse data. (Ibid.) According to PwC research (2017), organisations who are highly data driven are three times more likely than others report considerable improvement in decision making (PwC's … 2017).

MIT, "How Analytics and Machine Learning Help Organizations Reap Competitive Advantage", gives more insight how companies are using data and making, therefore, better decisions. As an example, it was brought out that Uber uses algorithms to monitor real-time traffic and trip durations to balance demand and supply for rides and also to balance fees accordingly. (How analytics … 2016)

1.2.2. Lean Methodology

Lean Six Sigma

As mentioned before, the difference between traditional companies and startups is the way they operate - startup is operating to find it's business model while a regular company has the business model first and operates according to it (Blank 2013). The same startup approach applies to operations within all the teams in the company, including recruitment. Startups operate in lean concept. It was briefly discussed that lean manufacturing together with Six Sigma, and JIT were predecessors to data driven decision making. Now it is necessary to look further into the lean concept in startups.

Lean Six Sigma approach is used not only to make products and processes better but instead to strive for better products, services and operations through innovation (Byrne et al. 2007). As proven by many startups, innovation in products and services can lead to business hypergrowth. This, however, means that processes within all the departments and teams should be lean as well.

If the business grows at a rapid speed, then more employees are needed in regards to keeping the momentum going. To get more people on board, HR and recruitment have a difficult task to undertake. How to attract smart people, who are needed to grow this business, and get them on board. Instead of multiplying the recruitment team, a better approach would be to fully utilise Lean Six Sigma and data driven decision making in the recruitment process to optimise the recruitment team effort - hire faster, smarter, with a smaller cost, and build a stronger employer brand at the same time.

As mentioned earlier, Lean and Six Sigma were different concepts. "While Lean is all about speed and efficiency, Six Sigma is about precision and accuracy: Lean ensures resources are working on the right activities while Six Sigma ensures things are done right the first time" (Laureani et al. 2010). Lean Six Sigma is the combination of the two concepts, using the best practices of both of the methodologies: increasing speed and accuracy (Mader 2008).

The Lean Startup

An American entrepreneur, Eric Ries, was the first one putting the lean startup concept to a paper. He wrote about it in 2008. As lean startup concept focuses on being data driven, then it is relevant to describe it in more detail here. There are few academic papers and researches conducted on lean startup concept, but many entrepreneurs have been writing about it.

As described by Wade Roush (2011), an editor at Xconomy (business, life sciences, and technology news), Ries came up with the main idea of a lean startup: build, measure, learn concepts. Ries took away from the lean manufacturing idea that it is important only to build things that customers will pay for and eliminate all processes that do not create value. Before companies and startups used to build the whole product and then after releasing to the audience found out if people would even use it. Due to this many startups failed because they spent a lot of time, effort and resources building something in the hope that once it is ready, people will start paying for it and startup will bring revenue. Quite often it did not happen. Ries' idea was revolutionary, instead of building the whole product in perfection, only a minimum viable product (MVP) was built that was full of bugs and built with minimal effort just to test the idea with customers. The imperfect MVP was sold to customers, and user tests were conducted to understand if people would purchase the product and how they would use it. To measure the success of the newly formed product, different metrics were used. It is important to use metrics to understand what exactly customers are thinking. After the analysis of the metrics and results of the user tests and behaviour, the product was adjusted and

improved. If, however, it came out that the product is not useful for customers and it will not be used, then it was either abandoned totally, or the startup made a pivot. (Roush 2011)

1.2.3. Metrics used in data driven approach

Using metrics to improve business processes is one of the key factors of being data driven. This section is looking into metrics that are being used in data driven approach.

Ash Maurya, the author of "Running Lean" and the creator of the one-page business modelling tool Lean Canvas, described in 2010 in his blog post that "An actionable metric is one that ties specific and repeatable actions to observed results." (Maurya 2010) Besides actionable metrics, there are also vanity metrics. Vanity metrics give an overview of a current state, like how many customers visited the website during the observed day, but it does not give a good understanding how this result was achieved and how to predict future from it (*Ibid*.). Therefore it is important to take a closer look at actionable metrics. The difference between actionable and vanity metrics is the way they are measured (*Ibid*.). Maurya shared three rules to measure actionable metrics: "Measure the right Macro... create simple reports...metrics are people too". Measure the right macro means that even though there are many different things that can be measured, identifying the right one is important (*Ibid*.). Dave McClure, an entrepreneur and angel investor, has identified 5 important metrics for startups: acquisition, activation, retention, revenue, referral (McClure 2011). Getting the data for the metrics are not only important. It is also important to visualize the data, so it is good to create reports and analyse them. Besides that, it is important to remember, that users themselves can add quality to the metrics, especially if a startup does not have too many users so that it would be able to get reliable quantitative validations. (Maurya 2010)

Coming back to Eric Ries, as he is the first person talking about lean startups and did a guest post to Tim Ferriss blog, the host of #1 business podcast on all of iTunes, in May 2009 where he explained in further details why actionable metrics are important. Actionable metrics provide data which gives useful information to make better decisions while most of the data that is provided off-the-shelf analytics packages do not provide sufficient information and therefore is called vanity metrics. Ries explains that most of the time when PR or marketing talk about something (new customer etc.) it is vanity metric as it gives little insight to what was made by the company that these new customers came on board. At the same time, when releasing a new feature in A/B testing, so that 50% customers see the new feature and 50% does not, and then a few days later look at the results of both test groups. That will give insight if the new feature is something customers actually

want and are willing to pay for as well. (Ferriss 2009) Therefore actionable metrics are important in order to understand the real information behind the data.

One example of data driven decision making comes from pCloud, a file security product, marketing team. Their marketing team released a campaign and a month after releasing it they started optimizing. The team created a funnel to monitor each step a user takes and noticed that in one particular step, many people dropped out of conversion. Due to this data, pCloud marketing team figured out a way how to avoid that particular step where users were leaving the conversion, and the results were far better than the team could have expected. Next week, the team noticed 135% rise in conversion rate and 124% rise in conversions and the weekly budget dropped 6%. (Puri 2017)

Ries suggest some tips to get more actionable data. For example split-tests, per-customer metric, funnel metrics and cohort analysis and keyword Search Engine Marketing (SEM) and Search Engine Optimization (SEO) metrics. Overall A/B tests are the best actionable metrics as they can either override or confirm any hypothesis one can have. Also, breaking down data per-customer or per-segment can bring valuable information. Funnel metrics and cohort analysis are important to visualise the data by groups to find the differences over time and make relevant conclusions. (SEM/SEO) metrics are influential to differentiate the different customer groups. It can give a good insight into what groups of customers are bringing in most value, so this information can be used to direct for example marketing campaign. (Ferriss 2009)

1.3. Data driven recruitment

As discussed earlier, digitalisation has changed the way businesses operate and make decisions. Also, modern companies and startups with flat structure have changed the positions within companies. It is getting widely practised that not only business manager has to make decisions, but also all the specialist are empowered to make business decisions, and data driven approach is a helpful tool for that. It is almost inevitable that industries, institutions and even job, as we know them today, will change radically due to digitization and big data analytics and data science (Loebbecke, Picot 2015).

As Krista Jensen-Eriksen noted in her thesis, Human Resource Management is also striving to move more towards data driven approach and become a strategic partner in the company instead of continuing to be an administrative function (Jensen-Eriksen 2016, 2). Using data alone is not good enough. To predict future, not only describe the past, it is important to start with a business challenge not just justify HR decisions with data. Data analytics helps to transform real-time big data into knowledge that can be used to help in decision making process for business challenges (Rasmussen, Ulrich 2015).

For example, one of the most prestigious companies, Google, have used data driven approach for a long time now. In an article by technology journalist Ciara Byrne, written in 2011, it was noted that Google uses data throughout the whole company, and just as well in HR. All the decisions in HR from compensation to hiring have been made by analysing data. For example, their "people's analytics" team forecasted the company's future structure based on the current hiring. It turned out that if Google keeps on hiring the same way, soon the company will be "fat in the middle", meaning there will be a lot of middle-ranking employees in the company which leaves junior employees with little chances to move up in their career ladder. Due to this data, it was decided to start hiring more junior employees so that they also have some room for development. (Byrne 2011)

As we have seen, data can be helpful in many ways. The examples of Progressive and Uber showed how businesses could use big data, Machine Learning and Artificial Intelligence to generate useful information that business can benefit from. From the case studies about Google, Progressive and pCloud, which have been looked into before, it can be clearly seen that all of those companies have benefited from data driven approach and as a hypothesis, the same approach can also be deployed to recruitment. For example, Applicant Tracking Systems (ATS) can be used to gather data that will be analysed. A good ATS is the one that allows recruiters to segregate data and get good reports out of it. To use available data, it is inevitable that data is collected, sorted and stored deliberately. We learned from lean startup model that there are some useful, actionable metrics to provide teams with insightful information: split-tests, per-customer metric, funnel metrics and cohort analysis and keyword (SEM)/(SEO) metrics. These metrics can actually be used by different teams, not only by the product team. In recruitment, split tests can be used for advertising or writing different job posts for the same opening to see which one attracts more relevant candidates. The per-customer metric can be looked as a per-candidate metric - for example, the author suggests that it can be useful if recruiters find out what are similarities in candidates, who tend to be more successful in hiring and after that who are successful in the company. That can

give a good insight on what to focus one's attention on when reading through all the candidate's CVs and interviewing as well. Funnel metrics and cohort analysis can be viewed as candidate pipeline metrics - how long candidates are spending in each stage and then try to go even more granular - is there something to do with any specific interviewers or the nature of the interview stage etc. and then try to fix it. It can be viewed separately for each job opening as usually the process of hiring people with different profiles can vary a lot. Keyword (SEM/SEO) metrics can be helpful learning where candidates find out about this company and the job so that recruiters can focus more on advertising on these channels.

1.3.1. Recruitment

Recruitment means finding a diverse applicant pool with required qualifications and potential and communicating employment opportunities to them (Raghavi, Gopinathan 2013, 301). Usually, companies receive a big number of applicants and selecting out suitable applicants can take a lot of time and effort. Even if recruitment is perceived as an administrative job by many, meaning that recruiters will post the available job and then manage candidates within the pipeline, then actually strategic recruitment is much more than that. It is important that recruiters and HR managers know the field they are working in, to promote the employer brand as well as to be able to effectively evaluate the success of the recruitment. (Stoilkovska et al. 2015, 284)

Often recruitment and selection process are addressed as one but actually in Human Resources' practice they are two different things (Taylor, 2005, 166). Recruitment is understood as a process, in which course of activities is carried out with the aim of attracting suitable candidates for the vacant position. Recruitment process starts with identifying the need for a new employee and ends when a candidate has applied for the vacancy. (Sule 2012, 21) On the other hand, during the selection process it will be decided which candidate is most suitable for the vacant position (Armstrong, Taylor 2014, 226).

Armstrong's Handbook of Human Resource Management 11th edition brought out the following stages for recruitment and selection: defining requirements, planning recruitment campaigns, attracting candidates and selecting candidates. (Armstrong 2009, 515)

In author's opinion, the planning stage what Armstrong suggests can be divided into two: planning and creating job advertisement and choosing channels. The author proposes that the recruitment process looks like in Figue 2:
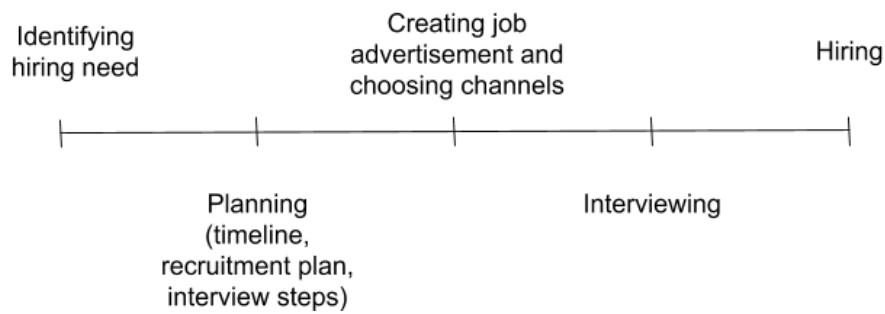
```
Identifying          Creating job
hiring need       advertisement and                    Hiring
                  choosing channels

├─────────────┼──────────────┼──────────────┼─────────────┤

            Planning                      Interviewing
            (timeline,
         recruitment plan,
          interview steps)
```

Figure 2. Recruitment process
Source: Author's figure (2018)

Already more than 20 years ago, Richard Lee noted in his article Recruitment in Context, that people are becoming more important in organizations than other resources like hardware, software, books etc. Building an organization with skilled people takes tremendous effort due to the availability of resources and technology. Lee also mentioned that due to the constant change, all recruited people must be ever more skilled and adaptable to provide the level of service needed. (Lee 1994) Since 1994, when Lee wrote about it in his article, this point of view has escalated even more.

As Ian Cook, an expert on statistical analysis and HR metrics, wrote in his article (2017), companies are struggling with hiring speed to keep up with hiring demands and competition is heavy for people who are in key positions in coming up with innovative ideas and provide value to customers. In Ian's opinion, data driven recruitment is the key to enable recruiters to make good hiring decisions and attract and keep the right talent needed. (Cook 2017) "The recruitment process is a treasure trove of data that — when mined carefully — reveals important information on whether or not a candidate will be the high performing employee your organization is looking for. It is the difference between making decisions on gut feeling and making them based on facts." (*Ibid.*)

Cook brought out (2017) some of the factors why recruiters cannot use data effectively at the moment. In his opinion, firstly, the technology does not allow recruiters to collect all the relevant and needed data from one place. Even though Applicant Tracking System (ATS) can provide some good data to improve time to hire or cost per hire, then it is not enough to make deliberate decisions about long-term success for candidates. For example, Cook noted that portion of important data is stored in a different system than ATS to make the best decision considering all the important data.

Secondly, the data used by recruiters are siloed. It is connected with technology as the useful data is stored in many different systems. It is time-consuming and takes a lot of effort to organise the data and make use of it. Thirdly, recruiters do not have a clear headcount plan – once again it is connected with data being stored in many different programs.

1.3.2. Recruitment metrics

Eric Ries has clearly stated in his lean startup concept that one of the important things about being data driven is using actionable metrics. In addition to that, Lermusiaux (2005) has mentioned in his article that HR overall should be focusing on metrics characteristics that include besides being actionable also being aligned with business strategy, consistency, time trackable and external benchmark. Alignment with overall business strategy is important for HR to understand what direction the business is planning to go and accordingly choose the HR tactics. Consistency is important so that comparison would be possible. It means that data in the metric used, should be consistent and always the same to compare the metrics throughout the time and make sufficient conclusions. Also, a good metric is time trackable, meaning that the metric should be tracked over time to see trends. Depending on the metric, it usually can be tracked weekly, monthly or quarterly. External benchmarking means peer comparison. If a metric is being used, then the results should be compared with the results of another group. Another group can be either another business unit within the same company or with a different company that has similarities with your own company. If a metric is only viewed internally, then the need for improvement might not be as obvious if the same metric is also benchmarked externally. (Lermusiaux 2005)

Thus, metrics that recruitment should be using are coming from business needs and are actionable, meaning that the used data will tell a story and based on that a clear picture will be formed on what action should be taken. The metrics should be time trackable, meaning that the same data can be compared over a longer period. Also, they have to me benchmarked externally to put context to one's own data.

For example, Hello Talent, a company that provides Candidate Relationship Management (CRM) and Recruiting tool, suggest four most basic metrics recruitment can track: Time to fill, qualified candidate ratio, the effectiveness of sourcing channels and hiring success rate. Time to fill shows how much time does it take to fill a position once it is opened. It can help to plan recruitment better in the future and also manage expectations of hiring teams. Qualified candidate ratio means how many qualified candidates were actually considered to fill the vacancy. The effectiveness of

sourcing channels shows what channels bring more and better candidates. It will help recruitment to allocate sourcing cost in the future. Hiring success rate measures success of the new hire once he/she has been onboarded to the team. (Robinson 2017)

Based on the previous theory, the author is suggesting what metrics to use in each recruitment step.

Identifying hiring needs

The first step is identifying hiring needs. Hiring needs can come from backfilling left employees, growing the current team or expanding the operation to other fields. This information usually comes from the business needs, and therefore it is important for recruitment to cooperate with hiring managers and well as the company management. Useful metrics to help in this case can be employee turnover rate, time to hire, time to fill.

Employee turnover rate is useful to try to foresee how many backfills are needed. If a company has collected turnover data across different positions over time with their HR system, then some relevant conclusions might be drawn. For example: what is the average time spent in the company in customer support team. If the data shows that in average customer support people stay in the company for 2 years and during summer period more people are moving away, then this can be considered when looking into the data for how many people in customer support team 2 years are coming closer and specifically when summer period is getting closer. Based on this information companies can decide whether to open the position beforehand or want to wait until the actual need comes.

Time to hire a specific position is useful for the relevant parties to understand how long it has usually taken to fill such position so that the management knows how to plan ahead. This data can be collected with ATS. If the company has not hired to the similar position before as needed in the future, it is harder to make specific plans, then market research can be conducted, but it is hard to find any metrics to measure for that. Time to fill on the other hand gives an idea of what is the overall time to find a suitable candidate for the vacant position.

Planning

Next step is recruitment planning. Once the hiring needs are identified, then recruitment team should plan their actions. Things to consider are timeline and recruitment plan. If hiring needs are known in advance, then recruitment can decide when the job post should go out to hire a person

for the right time. Recruitment plan should consist of the responsibilities of each party involved, job description and interview process. Metrics that can be helpful in this stage are time to hire and time to fill which might have been covered on the previous stage, candidate pipeline conversion, candidate NPS and feedback.

As mentioned before, time to hire can give an indicator of how long it has previously taken to fill such position and is there something that can be done to improve it. That gives an idea of when to start advertising the role. Data for this can be found from ATS.

Candidate pipeline conversion rate gives the recruiter an idea of how many people should apply for this job to get one successful hire. It can also be looked into how many people proceeded into the next interview round, and there might be some things to change as well to save interviewers' time to get one successful hire. For example, if a company is looking for product engineers and the interview process consists of prescreening interview, product interview, technical interview and final interview. Moreover, if the pipeline conversion shows that 80% of the candidates are falling out of the process in the technical interview, then it is a clear sign that a lot of time and energy is wasted on prescreening and product interviews. Then it is time to evaluate how to revamp the process so it can be identified earlier who does not succeed the product interview. Perhaps already before the prescreening interview, the candidates can be asked to do a technical task to eliminate those candidates who are not technically strong to pass technical interview anyway. This can save a lot of time for recruiters and also for team members who are interviewing. Candidate pipeline conversion rates can also be taken from ATS.

Candidate NPS and feedback is a good metric to track to understand how satisfied candidates have been with the interview process. Feedback is qualitative information while NPS can give a numeral value to it. Candidate feedback can give recruiters good insight on how to improve their process so that candidates are more satisfied with it. This information can be tracked with some ATS's and also survey tools.

Creating a job advertisement and choosing the channels
The third stage is creating a job advertisement and choosing the channels to advertise. As there are many new companies and job boards coming to the market all the time, then it is important to stand out with the job advertisement amongst others who are looking for similar talent. Also, to reach the right candidate pool, it is needed to choose right channels to advertise and source from.

Metrics used to make this stage more efficient are for example also candidate and coworker feedback, the source of candidates and response rate of headhunted candidates.

Candidate feedback can be collected via ATS or survey tools to understand what they liked about the job ad and what not, what else would they have liked to see in there to make the job ad more appealing. This information, of course, should come from previous experience and if to start looking for a position that has been hired before, then the candidate feedback from before can be taken into account. Also, feedback from coworkers can be collected when preparing a job ad, this can be either collected with a survey tool or personally.

Source of candidates is a good metric to look into when start choosing channels. First of all, all channels usually cost money and understanding which channels are effective is part of cost optimization. Besides cost, it is also time-consuming to advertise in many different channels. This metric can be also tracked with ATS used. Many job boards, however, do not have integration with ATS's and therefore it requires manual work. Channels might or might not convert good candidates. So, before advertising, it would be useful to look into historical data to see which channels have proven to be most successful when hiring a certain position.

Next metric – a response rate of headhunted candidates. Headhunting is a common practice to fill hard to find roles. To make headhunting more successful, one can track candidates' response rate and optimize it towards the maximum. As mentioned before, one aspect of being data driven is making hypothesis and learning point. With headhunting messages response rate one hypothesis might be that when the messages being sent to relevant people are changed, then the response rate will increase. A way to evaluate this hypothesis is to do A/B testing with the messages and then compare the results between each study group. The more respondents one can get, the higher the chance to get a good hire from these people.

Interviewing

The fourth stage in the recruitment process is interviewing. Once the hiring need is identified, recruitment process planned and job advertisement and channels are chosen and jobs posted, then it is time to interview the qualified candidates. Some metrics that can be measured at this stage are also candidate pipeline conversion, time to hire and candidate feedback and NPS – all of them have been explained previously.

Hiring

Final, the fifth step, is hiring the suitable candidate. This means making an offer and candidate accepting the offer as well. A useful metrics here to track are candidate feedback as well as rejection reasons.

Candidate feedback about the offers previously made as well as rejection reason can give valuable insight on what is important to candidates and if the rejection rate is high, then most likely it is time to look into what are the reasons that candidates did not accept the offer. Some recurring themes might come up, and then it can be decided whether or not these are something the company can improve. Rejection reasons can be tracked with ATS.

2. RESEARCH

In this chapter, the author is presenting the description of the empirical data collection and analysis in more detail. The structure is built up so that at first, the research approach is looked more closely. After that, the research design is described and also the data collection is presented.

As confirmed in the literature part, there have been few studies about data driven recruitment. There are, however, many non-academical materials and blog posts written about it. In this thesis, a pilot study was conducted within fast-growing companies and startups in Estonia as well as in one big corporation and in one recruitment agency to get additional comparable information. The aim of the study was to understand how companies are collecting and using data to make better recruitment decisions and improve their hiring efficiency.

Before going into the details of the research, it is important to highlight some principles that make teams data driven: team gathers actionable metrics and learns from the data.

Firstly, data driven teams to focus on actionable metrics in oppose to vanity metrics. As we learned before, vanity metrics can give us an overview of the current state of the observed metric – but it does not provide any information what was driving the result, and it can not be relied on to predict the future. So in this research, we have to understand if recruiters are focusing on actionable metrics.

Another principle that makes a team data driven is learning aspect. This means that teams are supposed to make a hypothesis to generate learning aspect when trying to change something. Based on the interviews and research, the author of the thesis tries to understand how teams, who are more data driven, have improved their processes.

2.1. Methodology

In current thesis, exploratory qualitative research was conducted. The base of qualitative research is to describe the real life. First of all, it seeks to find and present facts to the public instead of proving already existing (truth) allegations (Hirsjärvi et al 2005, 152 referenced in Õunapuu 2014, 53). The data collected with the qualitative research enables to understand if data driven recruitment is important for startups in Estonia and how it has helped the teams to make better decisions. The research question, that the author is looking to get answer to, is how data driven decision has helped recruiters to make their processes more efficient.

In the research part, 12 recruiters were interviewed to understand if they are using data driven decision making in their recruitment process. First of all, the author wanted to understand if they think that they are data driven and then, based on the interview it was evaluated if they actually are data driven. The evaluation was based on the theory written in the first section of the thesis. If the recruitment teams were data driven, then it was looked into more details how the metrics that are important for these teams have changed over time. This is to understand if decisions made based on data and evidence are actually bringing desired results.

2.1.1. Sample group

The sample group of this thesis consists of 12 recruiters and HR managers from 12 different companies: fast-growing startups, slowly growing startups, big enterprises and a recruitment agency. The main focus was on startups but to get some comparison, then one big enterprise and one small recruitment agency were added to the sample group.

The selection of the sample group was based on the theoretical selection strategy, taking into account the convenience criteria, meaning that the sample was created of people who were found most easily at the time of the survey in view of the above criteria (Laherand 2012, 71). The interviewees were found through different channels, five of them were acquaintances of the author and others were reached personally via LinkedIn. Two interviewees were reached out in a HR conference.

To get relevant insight, the companies within the sample group vary from size and age. The employee numbers of the companies interviewed who are doing in-house recruitment varied from 16 to over 2000. One large corporation interviewed, had more than 2000 employees, rest of them had mostly between 60-1000. A recruitment agency interviewed had two employees. The companies interviewed also varied from the location of the business, one was local Estonian company, and others were international companies. Due to the non-importance of the company identity, it was agreed with the interviewees that they would remain autonomous. Information that can identify the companies will not be mentioned in this thesis. Overview of the sample can be found from Appendix 1. The company age, size and number of hired people are not exact but divided into groups. Company age is divided into being younger or older than 1 year, or older than 3, 5 or 10 years. The size is divided into more or less than 15 people, more than 50, 100, 200 or 2000. People hired are divided into more than 10, 20, 50, 100 and 200. That being said, some of the companies have hired around 300-500 people. To keep them anonymous, it is not being brought out.

2.1.2. The course of the research and data collection

12 semi-structured interviews were carried out with recruiters and HR managers from 12 different companies. The interviews were conducted within the timeframe from March 10th 2018 until March 31st, 2018. All the interviewees were given a choice to do the interview face to face or via Skype. Most people chose to interview via Skype call. One interview was also conducted face to face, and one was done over email conversation because the interviewee had a busy work schedule and could not find time to call. Semi-structured interview form was chosen to give interviewees a chance to describe their thoughts and experiences more freely, and it included 10 questions. Interview questions were created by the author on the basis of a theoretical framework. The interviews were conducted in Estonian with Estonians and in English with non-Estonians. Most of the questions expected the interviewees to be data driven. If turned out that some of the interviewees were not data driven then their thoughts about it were asked.

The interviews were held in a quiet environment in to make sure the interviewees can talk without interruption. The interview lengths varied from 28 minutes to 44 minutes as can be seen from Appendix 1. The main reason was the fact that some interviewees did not have as much to share than others about being data driven. Questions asked from the interviewees can be found from Appendix 2.

2.1.3. Analysis method

The interviews were recorded with the consent of the respondents to the voice recorder. All the conversations were transcribed into MS Word documents. The transcription was done automatically at first, using Veebipõhine kõnetuvastus (http://bark.phon.ioc.ee/webtrans/) and then corrected manually.

In this thesis, the qualitative content analysis was conducted, and cross-case analysis technique was used. The relevance of this analysis method is that several case studies are considered at the same time to find recurring topics, similarities and differences. The analysis of the interviews was done manually, and no software was used.

Taking into account that the topic of this master thesis has not been studied in Estonia before, and the theoretical information is mostly absent, then it was decided to combine deductive and inductive approach. Theory part still greatly supports the research, but inductive content analysis helps to bring out facts that previous theory did not cover (Kalmus et al. 2015). The data was coded based on which recruitment process was addressed. Codes were divided into five categories: identifying hiring needs, planning, creating job advertisement and choosing channels, interviewing and hiring.

On the basis of the theory part of this master thesis, the author is suggesting a table in Appendix 3 that brings out the recruitment steps together with metrics that can be tracked as well as databases for tracking. The table is the basis of the whole analysis.

The results and analysis of the research are presented in the next part of the thesis. The direct quotes of the respondents start from the indent. Behind the citation, the number of the owner of the citation is written in brackets together with the year, e.g. (No 6 2018). The cropped part of the text is indicated by the symbol /.../.

2.2. Research outcomes and analysis

In this part, the findings from the interviews are reflected, and interview answers analysed. The analysis of interview outcomes has been structured on the basis of the recruitment process steps. It has been analysed how many companies are tracking metrics on each recruitment step and what

are the metrics being tracked. Also, examples of how the insight of the data has improved the recruitment process for the companies. Overview of metrics used by each company can be seen from Appendix 4.

2.2.1. Identifying hiring needs

It came out from the interviews that only 4 companies out of 12 are tracking something in regards to identifying hiring needs. Company No 1 mentioned that they would track time to hire and employee turnover rate. However, at the moment they are too young and does not have any relevant data in regards to it. They are using an ATS with good reporting to track this data.

A well-established company No 8 who has been in the market for more than 10 years now with more than 2000 employees and also has well-established recruitment team, said that hiring needs comes from Manager and HR partners who are working together with recruitment team. They are tracking how many people dropped out before probation period and how many dropped out before one year. This data is used to understand what to improve to make people stay or attract candidates who are more likely to stay. They are keeping and tracking this data in excel sheet. (No 8 2018) As a suggestion, this data can also be used to forecast the future hiring needs.

Company No 6 said that they started looking for attrition to understand what it has been historically to understand if it is possible to forecast the turnover in the future. This data is tracked in Looker – an analytical tool which gets its data from HR system or from ATS. They are also tracking the number of hires via their ATS – how many people were hired according to plan and how many we hired off the plan. This makes it easier to understand how many hired people were not foreseen. That information is shared with hiring managers. This can help the hiring managers to take into account how many people each quarter they have hired without knowing the need before and take it into account when start hiring again to make plans more realistic for their own team as well as for recruitment team.

> *"Well, at one point we tried tracking attrition, what it has been historically, alright? To understand if it's possible to forecast how many people are leaving the team, for example. We did not get too far with it."* (No 6 2018)

> *"Another thing we've been trying to track, if the hires are on plan or off plan to understand how many are those hires that we can not plan /.../ so that together we can plan, yes.. these*

are the hires we know what we need but perhaps, as historically each quarter has been 3 hires who have came from who-knows where, then we know how to forecast better." (No 6 2018)

It was mentioned by the recruiter of company No 6, that even though the company has data, there is still no good outcome of it because the company growth rate is still unknown and there are still a lot of people hired off the plan. As the company itself does not know how fast it is growing and who is needed, so recruitment team is always behind planning their own need to hire for recruitment team.

Company No 10 said that they are tracking employee turnover rate, but it is done to keep an eye on it and make conclusions. The data is taken from ATS but is being tracked in excel sheet. It is not something they are trying to fix. When asked about why they are tracking turnover rate and what information does it provide, then the answer was:

"Interesting questions, right. Why do I track it? I guess I want it to be as low percentage as possible. /.../ It's good to keep an eye on it and make summaries. Can I forecast something or make things better based on that? Good question. Perhaps it should be done in a smarter way." (No 10 2018)

Company No 7, who has been starting to track more data now but so far has not been really data driven as it has been hard to track, said that it is hard to identify hiring needs as they are reactive because plans are not certain. Everything depends on the projects that are coming in. Even top management does not know exactly what are the needs for the next two quarters.

"We are rather reactive than proactive. We're hiring where needed. /.../ Cannot forecast too long ahead. /.../ right now field managers nor top management can say what are the plans for the next two quarters." (No 7 2018)

Also, many companies said that they are not tracking turnover as there have not been many people leaving and therefore there has been no need for it (e.g. No 4 2018, No 5 2018, No 7 2018, No 9 2018). Two companies (No 1 2018, No 11 2018) do not have any data yet, even though they think it is important to track it. Company No 1 is less than a year old and Company No 11, has been just

tracking it since a new recruiter started a couple of months before the interview. Headhunting agency No 12 is also not tracking it because it is not relevant for them (No 12 2018).

All the interviewees confirmed that it is hard to identify hiring needs as business needs are constantly changing, and it is hard for the management to foresee the hiring need. Even so, some companies are trying to track turnover rate and time to hire, but non of the companies had a good example how they have managed to make this step more efficient relying on data.

One highlight here is that the number of hires seems like vanity metric at first. However, looking at the comments of Company No 6 about why they are tracking the number of hires, then it actually proves that it is an actionable metric.

Highlight:
- 4 out of 12 companies are tracking data at this stage;
- Data being tracked does not lead current companies to be more efficient;
- A number of hires proved to me most useful out of these interviews.

2.2.2. Planning

It turned out that 8 out of 12 companies said that they are tracking metrics for planning. All of those eight companies were tracking time to hire, five companies were also tracking time to fill, and one company was also tracking pipeline conversion.

Company No 3 is tracking time to fill and time to hire metrics for planning interviewing and besides that pipeline conversion via ATS. They have improved the interview process throughout the year a lot. For example, a couple of times a year recruiter is meeting with the hiring manager to look into interview process – how long it takes to fill a role, how many applicants went into each step and analysed how to make it better. They analyse the candidate's pipeline conversion. For example, they look into the results of the tests candidates have to take and decide if the test task is suitable or should it be changed based on the number of applicants who proceed to the next stage and who drop out. They also analyse if they can do something to cut out some of the candidates more at the beginning of the process to not waste time on interviewing not suitable candidates. (No 3 2018)

Two of the main KPIs of the company No 6 are time to hire and time to fill, and it is tracked via ATS and analysed in Looker.

> *"We're trying to understand how fast we can put candidates throughout the interview process and the other one is how long does it take us to work with one role to forecast in the future. Okay, it takes us, well, about 70 day to find that person, then we know that in the future we have to start looking for this position at least 70 days before we want them to start."* (No 6 2018)

> *"Okay, pipeline, where are the bottlenecks. People are coming in very fast /.../ and somehow they also pass phone screening and then suddenly they will stop on the 1st interview stage. Is it because we can not get feedback or availability or what is happening."* (No 6 2018)

A recruiter from company No 11, said that in her previous job they knew that some areas have bigger movement and turnover, so they were more proactive. For example with junior positions. It is known timeframe when juniors are graduating from school, and there is a pattern of availability that the company can keep in mind, e.g. hire juniors during summer time after graduation. (No 11 2018)

Time to hire is a good metric to track because it can give an overview what has the length of the hiring process been historically, once the candidate submits the application, and is there something that can be improved to shorten the time. Time to fill is also a metric to track because it can give an overview of how long has the overall process been, from opening the position to hiring someone to fill the vacancy.

Highlight:
- 8 out of 12 companies are tracking metrics in this stage;
- Time to hire and pipeline conversion seemed to be most useful metrics for the companies;
- Based on previous hiring numbers, it can be improved upcoming hiring.

2.2.3. Creating job advertisement and choosing channels

The third stage, creating job advertisement and choosing channels, is somewhat tracked by most of the companies. All companies, being actual data driven or not, are tracking what channels

perform better to understand where to post jobs and what channels to use to get more qualified candidates. It is related to cost as well. Choosing wrong channels can become costly for the company. Of course, the sources will vary depending on the role, but conclusions can be drawn already during the first hiring process. Besides this metric, two companies are also tracking response rate for headhunted candidates, and one company is also tracking from clicks to the application in their job advertisements.

For example, the company No 1, who is still young and has not been hiring too many people yet but will expand its team by approximately 30 people this year, said that they are already looking into the source of the candidates amongst other metrics that are being tracked. This information allows them to make better hiring decisions. The data shows which sources are effective and which are not. With this information, they know where to advertise more and what channels to drop. The recruiter said that they will win time and when not having to post and manage jobs in places which are not performing and they can spend on places through what they can actually get good candidates. This data is being tracked with ATS that provides good reporting.

> *"For example, we advertised in India, and we spent a lot of time reviewing and interviewing those candidates but they were not successful, so we decided to drop targeting this country."* (No 1 2018)

Also company No 2, who is fast growing startup and has been in the international market for many years now, said that they are not measuring anything else at the moment but are looking into the source of the candidates. They said that active sourcing for candidates had been proven to be the most successful especially in those roles that are high demand, for example, IT talents. As this is the best way to find qualifying candidates, then they are focusing on this source. They are trying out A/B testing of reach-out emails. One email is sent to one sample group, and another kind is sent to another sample group. Then the results will be compared, and better performing message will be taken as a starting point for a new A/B testing. So far, company No 2 has learned that the response rate on personalised messages is 41% while on the generic message it is 23%. In both cases, 20% of the responded people were interested in the position. (No 2 2018) It turns out that attracting people is important to get bigger response rate because it also means that more people will be interested in the position.

Company No 5 who is only tracking the source of candidates said the following:

"We are indeed looking at source of hires, for example, we're not using CV online anymore because the candidates' quality was very poor. Well, we're pushing referrals as this has proven to work best and also sourcing from LinkedIn works well for us." (No 5 2018)

Company No 7 said that they are not tracking the source of candidates yet, but previous experience of the recruiter has shown what channels are performing well and what not. They will start tracking with their new ATS which will give them a better overview of the sources of candidates, as well as other metrics they start, will start tracking. For job description, they are already using textio and copywriters to write more appealing job advertisements. Textio gives an indicator what words to use and what not. This is not data driven approach however they also ask feedback from their own employees on the job descriptions and based on the feedback they are improving it.

One good example was given by Company No 10 about the job advertisements. They are analysing what works and what does not. As an example, they said:

"Once we started recruiting for a new position and we wrote the job ad based on our need and the job analysis that we did. As a result most of the candidates who applied were overqualified and they applied from all over the world. We however actually needed someone who has approximately 3 years of experience and who is willing to learn fast from local market but we did not receive such candidates. So, we closed the position and rewrote the job ad with new and more relevant requirements and did not advertise in LinkedIn." (No 10 2018)

They did not ask any feedback from candidates nor other people as they saw that they wrote the job ad to attract wrong people. Recruiter sat down together with the hiring manager and analysed the people they attracted to the previous job post and whom they are actually looking for. After rewriting the job ad and advertising only in the local market, they received more qualified candidates and hired one.

Another good example of writing job advertisement came from Company No 6. They said they have started tracking why people are joining. In their application form, they are asking following questions: why do you want to join and how did you hear about us. Based on the results they redid their job ads and put more information in it about the things that candidates care most about to

attract them more. Also, the questions about where candidates hear about the company will give them an idea of what to do more, for example, write more blog posts or talk in events. Besides that, company No 6 is also tracking how many people out of those, who click on the job advertisement, actually also applied. This data is available via their ATS. Tracking this can give them information how their job applications have improved. It can either prove or disprove their hypothesis' about making certain adjustments in their job ad in a belief to attract more candidates.

As can be seen, the source of hires is the most tracked metric by the companies, even by those who do not track anything else. It can give information where to turn one's attention and money to get most qualified candidates. Also, as headhunting becomes more important to get good hires, some companies are showing a good example how tracking response rate and doing A/B testing can be useful.

Highlights:
- 12 out of 12 companies are tracking data in this stage;
- Source of candidates is the most tracked metric by all companies; probably because it is hard for everyone to find good IT talent;
- Another useful metric tracked by some companies is response rate of headhunted candidates.

2.2.4. Interviewing

50% of the companies interviewed are also tracking metrics in their interviewing stage. Metrics mostly tracked in this stage are candidate feedback/satisfaction and NPS, which is tracked by five companies and pipeline conversion, which is also tracked by five companies. Also, time to hire and time to fill has been track not only for planning purposes but also for interviewing purposes. The number of companies who track them for this stage is smaller than the number of companies who track it for planning purposes. Time to hire is tracked by five companies and time to fill is tracked by four companies.

Company No 6 said that one of their main KPIs includes time from application to offer and time from role open to close. Each recruiter also looks into candidate pipeline conversion to identify bottlenecks in which stage candidates stops moving within the interview process and analyse it and then try to fix it to make the process faster. This metric is relevant for this company in interviewing stage, as they have the roles constantly open and as a result of looking into the data,

the interview process can improve. The data for this metric comes from ATS. For example, in their hiring process of one similar role, at first they did not have a unified process for it. Each hiring manager had their own process for the same role. They saw a problem there because interviewers were not exactly sure what they should evaluate in their interviews and candidates had different processes for the same role based on who was the hiring manager. They started fixing it. All the hiring managers came together and had a meeting with their recruiter and made universal interview process for all interviews and currently, everyone understands what the process is and who is responsible for evaluating what in each interview step. Since then, interviewers have become more confident in their decisions. It also made hiring easier.

> *"I, as a recruiter, could tell the candidates what is the process and candidate did not drop out anymore. All product managers also could understand themselves what's going on /.../ what was evaluated in each interview process /.../."* (No 6 2018)

An example how this improved the hiring is the following example. Before the unified process, they hired one person for this role per quarter, and now they are hiring on average six people for the role per quarter. Everyone was involved, and the hiring process was more clear and faster.

Besides that, company No 6 is also asking candidate NPS and feedback as candidate experience is important to them, and it also gives a good insight on what to keep on doing in their interview process and what to improve. Company No 6 is using a good ATS that lets them collect and analyse candidates' feedback as well as other metrics.

Company No 7 has not tracked anything so far, but they start tracking candidate pipeline conversion, time to hire and time to fill and interviewer quality as soon as they have changed into a better ATS that enables them to get reports about the metrics. The recruiter knows that hiring managers who are faster in filling in feedback forms after interviews are hiring more people. When it is tracked with ATS, it can also be shown in the paper to others, that data shows that interviewers who fill in scorecards faster are also hiring faster, so it is important to improve their speed in giving feedback.

> *"We have 30 Hiring managers./.../I can see myself, that those hiring managers who are faster have managed to hire 4 people here within three months. But those who are just*

vegetating and who does not deal with this matter can not hire anyone. So, then they tell me that this team needs people, but I can say that it does not stand behind me. Then I can show it based on data that okay, the bottleneck is certainly there." (No 7 2018)

In the future, they also want to start tracking candidate feedback, but at the moment they do not find it to be a priority.

Company No 8, said that only recently they have started collecting candidate's satisfaction, but do not have any results yet.

Company No 9 said that they are trying to be very fast in their interview process and therefore does not track any metrics. The fastest they have hired a person is less than a week. They are asking feedback about the interviews from the people they have hired personally but do not track it systematically.

Company No 10 is tracking time to fill and time to hire also pipeline conversion and candidate feedback from candidates who have done at least one interview round with them. All the data coming in from these metrics will be analysed in excel and looked into how to improve. As an example, they looked over the candidate pipeline for one role and changed the interview process. At first, they did the first interview before and then proceeded with the test, but many candidates did not pass it, and they also did not have any hires. Then they changed the process so the test comes first and that already excluded many candidates who otherwise would have gone through the interview process. That saved a lot of time as those who do not qualify after test were not even interviewed. The result on the example above was the following. At first, they received 78 candidates, 29 of them did the first interview but no-one was hired so they wasted time interviewing these candidates. After that, they started all over again. Then they received 42 candidates, 7 received home tests, and all of them went to the screening, technical interview and some proceeded to the final interview. After that, they hired one person. (No 10 2018) That can clearly show how modifying interview process can save time and also bring better results.

A recruiter from company No 11 also said that previously has tracked and will start tracking in current company time to hire, time to fill, time spent on each stage as well as candidate feedback. The recruiter said that when looking into the data received, it can be analysed and interview process can also be improved.

It can be clearly seen from these examples, that looking into and analysing data can lead to modifying interview processes and can lead to better results as proven by the examples of company No 6 and company No 10. As proven by company No 7, data can also be useful to show the reasons for failing in hiring to relevant parties so that it can be seen from paper and then, hopefully, it can lead to improvement.

Highlights:
- 6 out of 12 companies are tracking data at this stage;
- Metrics being tracked in this stage could have been tracked in other stages as well. Like time to hire could have been tracked in the planning stage. However, the need to track it depends on whether the company keeps roles open for a long time to fill many positions or are they only looking to fill one position;
- Candidate pipeline conversion, candidate satisfaction and time to hire are most tracked and useful at this stage.

2.2.5. Hiring

Only 3 companies out of 12 are tracking some metrics in the offer stage. Two companies are tracking offer rejection reasons, and one company is tracking time to offer.

Company No 1 is tracking rejection reason via ATS. However, it is too early to draw any conclusions. Company No 6 is also tracking rejection reasons and how long does it take to close people meaning how long are people in offer stage. ATS gives them all the data needed.

> *"Last quarter, for example, 8 engineers did not accept offer, because /.../ the salary was not high enough. Then you can already go to the hiring manager and say: "I don't know if we have a problem with salaries but we should talk about it".* (No 6 2018)

After talking to the hiring manager, they can already decide what can be done about it.

Company No 10 also asks candidates the reason why the offer was rejected but does not collect it systematically. Company No 11 said it is something worth tracking but so far does not have data yet.

Highlights:

- 3 out of 12 companies are tracking data at this stage;
- Only a few metrics can be tracked at this stage;
- Candidate rejection reason seemed to add the most value to recruitment at this stage.

3. RESULTS AND DISCUSSION

In current part of the master thesis, it is looked into the main results and conclusions of the study and answers will be given to the set research questions.

General

Overall, it came out that 50% if the interviewed companies thought of themselves as being data driven. It means that they are tracking data for at least in 3 recruitment process steps. Based on the theory and being looked into the meaning of being data driven, the author of the thesis found that only 25% of the interviewed companies are actually data driven. The main reason for the difference is the fact that companies also tracked many vanity metrics. A table with conclusion what companies are actually being data driven can be found from Appendix 5. Some companies, e.g. No 7 said that they would start looking into data, but did not have the process ready yet, so it was concluded that so far they have not been data driven. Appendix 6. Shows how many companies said that they were data driven at each stage and how many actually are.

Only 3 of the companies have been tracking data for long enough to have time to make any conclusions and start improving the processes to improve their Key Performance Indicators (KPIs) and metrics.

Other 50% of the interviewed companies said that they are measuring some data but are not really data driven overall. It was brought out by many companies, that at the moment they do not see value in it. One reason that was brought out by some companies (e.g. company No 4 and No 9) who are not being data driven is that it is because the recruitment team consist of one person and therefore they are storing the knowledge and data in their heads. However, they both agreed that they see value in it if the team grows.

It also came out that most of the companies are being reactive in their recruitment process as even leadership often does not have a clear understanding of the hiring needs for the next year or even quarter. It was said many times that it is good if recruiters can get one-quarter notice in regards to

hiring needs. This was not only relevant to the fast-growing startups but also for the companies who are hiring more slowly.

In regards to databases used to collect and analyse data, it turned out that most of the companies are still using Excel and Google sheets to track metrics. Many companies are using some sort of ATS, but not good enough to allow reporting. Only 4 companies are using a good ATS that can also be used to track different metrics. One company is also using Looker – an analytical tool to analyse data besides an ATS. It was interesting finding that some companies who are hiring more than 200 people a year are not using a good ATS, which can actually help them to track more easily without putting too much effort in it. It was discovered that companies who are using Greenhouse and Lever ATS could get good reporting from it and therefore tracking and analysing data is not difficult. On the other hand, companies who are using other ATS's like Easycruit, Recruiterbox and Workable, have to use Excel and Google sheets as an extra to track and analyse data. However, they are not good enough to allow efficient reporting to analyse better.

It can be inferred that companies who have become to an understanding that data is important to them and it actually can help them to be more efficient in their processes have also chosen to use an ATS that helps with it. At the same time, it can be other way around, if companies have chosen the ATS first and then learn that it also provides good reporting, only then they start looking into the data and start seeing patterns and pain points that need to be dealt with.

From all the interviews it came out that the need to track metrics are not coming from the company side, but rather it has been an initiative of the recruiters themselves. Only one recruiter said that management could sometimes give an indicator of what to start tracking. It was an interesting finding because mostly the companies who were interviewed were startups. However, startups are data driven in all aspects, meaning they have to track customer conversion, marketing campaign results etc. As being data driven should be written in startup's DNA, then it is surprising, that management in many companies has not thought of expanding it to also recruitment team. Especially because recruitment plays an important role in the growth and development of the company. However, the fact that recruiters themselves have found it to be useful and needed proved the theory that in startups the structure is indeed flat and teams are autonomous. So it is the recruitment team's responsibility to come up with strategy and improve their processes.

Recruitment process and metrics

The study revealed that those companies who are intentionally tracking data have only chosen some metrics to track. The interviewees had not made a strategic plan for improving all the steps of the recruitment process. Even though from the analysis it came out that 3 companies are tracking metrics for each recruitment step, then it was not their initial intention. One of those companies have just started tracking metrics, and this decision was made since the very beginning of their recruitment process. Moreover, due to that, also a relevant ATS was chosen. However, this company has operated too little time for them to have any concrete examples of how data has helped them to improve their recruitment process. The other two companies who have been systematically tracking data for some years already have found the need from the pain points they have had. The same goes for other companies as well, everyone said that the need to measure something comes from the pain points in the process. As many companies are not measuring many things, then perhaps they are satisfied with the current process and have not thought that perhaps it still can be improved.

It was found, that identifying hiring needs is the second least measured step in recruitment process but actually the least improved one. Even if some companies are measuring something, it was not clear to them why they measured it, or it did not lead to any result. For example, company No 6 was struggling with hiring the number of people needed, and therefore they started tracking attrition and also people who have been hired on-plan and off-plan. Unfortunately, their effort on tracking attrition did not lead to any success. It seems that to have any success in tracing employee turnover or other metrics for identifying hiring needs, the company growth should stabilise. Because if companies cannot even forecast what their growth rate will be or what positions are needed, then focusing on turnover perhaps does not seem like a priority.

It can be concluded that even though there are some metrics that in theory can help recruitment and management to identify hiring needs, then it is hard for fast-growing startups to foresee it. Even if data is collected, then it is hard to draw any conclusions. A good suggestion came from company No 6. Even if it is hard to know the hiring need for the future, then companies can make tentative hiring plan. Moreover, when tracked people who were hired on-plan and off-plan, then it can give some insight how many extra hires should be added to the hiring plan to get more realistic numbers. This can help the company in many ways. For example, this can help recruitment team to plan their own working time and headcount. Moreover, that can lead to smoother and faster

hiring process for the hiring team. If there are as little surprises as possible, then recruitment team can work more effectively and provide better results.

Half of the companies interviewed found it important to track some metrics for planning purposes. All the pre-proposed metrics were tracked by one or another company except for candidate feedback and NPS. Mostly recruiters found that it is important to track time to hire. Time to hire is a good metric to track because it can give an overview what has the length of the hiring process been historically once the candidate submits the application, and is there something that can be improved to shorten the time. Also, time to fill is a metric that many tracks. It can give an overview of how long has the overall process been, from opening the position to hiring someone to fill it. Candidate pipeline conversion has been tracked by some companies to plan better, but it would be suggested for more companies to track it for planning. However many companies are actually tracking candidate pipeline conversion, but they are tracking it for the interview stage. The common theme for that can be the fact that many companies do not even close the roles and are hiring continuously. Therefore there is not much planning to do. The same goes for candidate feedback about the interviews. Some companies are asking it, but it is mainly in the interview step to get quick feedback and improve the process while it is already in process. Yet the same conclusion can be drawn that due to recruitment team being more reactive than proactive, then it is also not easy to track metrics for planning purposes.

The most measured metric was source of hires in the step of creating job advertisement and choosing channels. As mentioned before, recruiters are tracking what seems to be the biggest pain point for them. It is understood that attracting talent is becoming more challenging every day and at the same time recruitment is costly for the company. To advertise in right channels, it is important to understand what channels convert. That can save recruiters' time and money for the company as well as lead to better hiring quality. Yet another good example of how this stage has been improved by companies came from company No 10 and company No 6. They described how analysing job posts and data that came from candidates gave them better results.

Most useful metrics tracked in interviewing stage has been time to hire, candidates pipeline conversion and candidate feedback. Company No 6 brought a good example how their time to hire improved for one specific role after the interview process was improved. Also company No 10 changed their interview process after reviewing candidate pipeline conversion, and as a result, they did not spend so much time on interviewing not qualified candidates and also received a better

result. Offer stage is very little tracked, yet example brought by the company No 6 shows that tracking rejection reason can give a good insight on what to improve. It can be clearly seen that tracking these metrics and analysing them can be beneficial for the company, yet not many companies are actually measuring them. Once again, perhaps this step has not been a pain point for those, who are not measuring any metrics at this stage.

Overall it can be concluded that being data driven is important to some companies and it has become more important in recent years. Many companies told during the interview that they have thought of becoming more data driven but have not done so yet. As one of the aims of the research was to identify how data driven Estonian companies are, then from the interviews can be concluded that some companies are data driven and others not so much. It seems though that the trend is raising.

Another aim of this research was to get an answer to the question how the companies who are data driven, have become more efficient. It came out that there have been very good examples how companies have improved their processes when looking into and analysing data. In author's opinion, the most data driven company interviewed was company No 6, they also confirmed that it had been their recruitment strategy for almost two years now. As they said, the main KPIs they are tracking company-wide are number of hires (who were hired as on-plan and off-plan), candidate satisfaction, time to hire and time to fill to show how they have improved, then the following table (Table 1) is illustrative, how these KPIs are correlated with each other.

Table 1. Company performance within the last 1.5 years

	Number of hires	Candidate satisfaction	Time to hire	Time to fill
23rd Sept 16- 22nd March 17	132	73%	46 days	70 days
23rd March 17- 22nd Sept 17	284	78%	45 days	50 days
23rd Sept 17- 22nd March 18	317	82%	36 days	46 days

Source: No 6 2018

As can be seen, all the KPIs have improved with almost the same number of recruiters in a team. Even though the number of hires has grown, which means the workload is higher, then the quality of the interviews have risen as candidates are more satisfied with the process. Also, time to hire and time to fill have dropped. Other metrics that the company is tracking has helped to improve those KPIs, like source of candidates, candidate pipeline conversion and offer rejection reasons. It can be clearly seen that if data driven recruitment becomes a strategy, then it can lead to the more efficient recruitment process.

> *"You should be aware of what you're doing and data is the best way of being aware."* (No 6 2018)

CONCLUSION

The aim of the current thesis was to investigate, how Estonian fast-growing startups and companies have used data driven decision making and how it has improved their recruitment process.

The theoretical framework of current thesis lays out the evolution of data driven approach. It starts out with giving an overview of the history of how data driven approach has evolved which then leads to recruitment processes and how to use data in recruitment to become more efficient.

As the empirical research, 12 semi-structured interviews were carried out with 12 recruiters from Estonian fast-growing startups and companies. The research question, the author wanted to get an answer to, is how recruiters from Estonian companies have used data to make calculated decisions and how it has affected their recruitment process. 5 recruitment process steps that were proposed by the author at the end of the theory part were the basis for analysing how data driven companies are and what metrics are used to make these steps more efficient.

The study revealed that 50% if the interviewed companies thought of themselves as being data driven, meaning they are tracking data for at least in 3 recruitment process steps. When analysing the answers on the basis of the theory – what actually being data driven means, it was found that only 25% of the interviewed companies are actually data driven.

The most data driven recruitment step among companies was creating job advertisement and choosing channels. As all the companies are hiring IT talent, then their common pain point was to get quality candidates into pipeline fast and therefore knowing what channels to use to attract talent was measured most.

Second most measured recruitment steps were planning and interviewing – yet only 33.3% of the companies were tracking metrics in these steps. In the planning stage, the most measured metrics was time to hire. That shows how long candidate spends in the process before being hired. When analysing the whole time as well as time spent on each interview stage, recruiters can make adjustments to make the process faster as well as this information can be used to plan the next hiring round. In the interviewing stage, the most measured metrics were candidate satisfaction and NPS, candidate pipeline conversion and once again, time to hire. Candidate satisfaction and NPS gives an input of what candidates thought of the recruitment process, and it can be modified based

on their feedback. Candidate pipeline conversion shows granularly how many candidates move within the pipeline. It can be analysed, for example, what is the percentage of people passing each interview step. If it is found that a big number of candidates drop out in one certain stage, then it can be looked into, how to improve the interview process to identify not successful candidates sooner.

The least measured steps were identifying hiring needs, and hiring stage - only 25% of the companies were data driven in these steps. It was confirmed by interviewees, that it is hard to identify hiring needs as the companies are growing fast, so even leadership does not know who is needed to be hired in the future. Yet, companies tried tracking employee turnover rate but without any action taken, because the data did not provide them with any actionable information. The only useful metric used in this stage was time to hire. This was tracked for on-plan hires and off-plan hires to understand how many hires cannot be foreseen and adjust the hiring based on this data. In offer stage the useful metric tracked was offered rejection reasons. This gives the company insight on what candidates want and to improve in their offers if possible.

The main finding was that companies, who have made data driven decision making their strategy, are being more successful and they had made good improvements in their recruitment processes. For example company No 6 hired six times more people with same time and resources or company No 10 eliminating not qualified candidates earlier in the process. It was figured, that it takes a long time to collect data to start improving processes on a larger scale. However, even short-term data can be useful in some cases. For good data collection, a good ATS is needed that allows granular reporting. The most data driven companies have been data driven for years now and can clearly demonstrate improvements in their processes while companies who have recently started tracking data are more vague about it. The commonality in the most data driven startups is that they have been on the market for over 6 years and are hiring at a fast pace.

Based on the research outcomes, the author suggests all companies make strategic data driven plans for their recruitment no matter how fast their company is growing. That allows them to become proactive instead of being reactive in their processes. To get good data, it is important to use a good ATS that allows effortlessly pull reports and analyse them.

Author finds that there are many possibilities for further researches. For example, it can be researched different metrics and possibilities within them more gradually. Also, research can be

expanded to hired candidates quality. How to use data to identify high performers early in the process etc. There are countless opportunities for further research on data driven decision making in recruitment.

KOKKUVÕTE

ANDMEPÕHINE OTSUSTE TEGEMINE VÄRBAMISEL

Liisi Eenmaa

Viimaste kümnendite jooksul on tavaliseks saanud idufirmad, mis oma ambitsioonidega konkureerivad tihti mitte ainult kohalikul turul, vaid ka üle maailma. Konkurentsivõime säilitamise eesmärgil on muutunud ka ettevõtte struktuur. Lameda struktuuriga ettevõtetes ei ole ainult juhid need, kes otsuseid langetatavad, vaid valdkondi esindavad meeskonnad. Selline lähenemine toob kaasa rohkem lojaalseid ja vastutust võtvaid töötajaid.

Tarkade, kalkuleeritud otsuste tegemiseks, mis võivad viia äri eduni, on vaja tugineda andmetele, mitte ainult intuitsioonile. Andmepõhiste otsustuste tegemist kasutatakse tänapäeval palju, eriti just idufirmades, aga ka väikestes kiiresti arenevates agiilsetes ettevõtetes. Praeguseks on juba mitmed valdkonnad saanud kasu andmepõhisest otsuste tegemisest, alustades toote arendamisest kuni turunduseni. Kuna värbamine mängib kesket rolli ettevõtte talentidega varustamises, hakkavad tasapisi ka paljude organisatsioonide värbamismeeskonnad otsuseid andmepõhiselt langetama. Kuna ettevõtted võitlevad talentide nimel kogu maailmas, siis on oluline, et värbamisprotsess oleks võimalikult tõhus, eriti kui värbamise vajadus on suur. See võimaldab ettevõtetel värvata arukamalt ja kiiremini − saada rohkem ja paremaid kandidaate tööle vähema aja ja jõupingutustega.

Uurimuse teema on asjakohane, sest andmepõhine otsuste tegemine kogub Eesti ettevõtete seas autori arvates populaarsust. Praeguse hetkeni ei ole Eestis tehtud uuringuid andmepõhise värbamise kohta.

Antud töös uuris autor, kuidas erinevates värbamisprotsessi etappides otsuseid tehakse, ja selgitas, mismoodi andmepõhine otsuste tegemine aitab Eesti kiiresti kasvavatel ettevõtetel värbamist efektiivsemaks muuta.

Uurimisküsimus on, kuidas andmepõhine otsuste tegemine on aidanud ettevõtetel oma värbamisprotsesse tõhusamaks muuta. Vastuse saamiseks viis autor läbi avastusliku kvalitatiivse uuringu ning tegi kvalitatiivse sisu- ja juhtumipõhise analüüsi. Uuringu tarvis intervjueeriti Eesti ettevõtete 12 värbajat.

Lõputöö esimeses osas kirjeldab autor andmepõhisuse teoreetilist raamistikku ja arengut. See hõlmab ülevaadet ajaloost, andmepõhise lähenemisviisi arengust ja selgitab mõisteid, nagu "lean manufacturing" ja "lean startups". Teoreetilisele osale järgneb värbamisprotsessi ülevaade ning selgitus, kuidas värbamist andmepõhist otsustamist kasutades tõhusamaks muuta.

Magistritöö teine osa keskendub uurimistööle. See hõlmab metoodika kirjeldust, mis käsitleb valimi moodustamist, uuringute läbiviimist ja analüüsimeetodeid. Teiseks esitatakse uurimustulemused. Kolmas osa on tulemused ja arutelud.

Uuringu tulemustest selgus, et 50%, intervjueeritud firmadest arvasid, et nad kasutavad andmepõhist otsustamist, mis tähendab, et nad jälgivad andmeid vähemalt kolmel värbamisprotsessi etapil. Analüüsides vastuseid teooriale tuginedes ning arvestades seda, mida andmepõhisus tegelikult tähendab, leidis autor, et ainult 25% intervjueeritud ettevõtetest on oma värbamisotsustes andmepõhised.

Kõige andmepõhisem värbamisetapp ettevõtete seas oli töökuulutuse loomine ja kanalite valimine. Kuna kõik ettevõtted otsivad ITtalente, siis oli nende jaoks suurim valupunkt kiiresti kvaliteetsete kandidaatide leidmine. Seega on oluline teada, milliseid kanaleid talentide ligitõmbamiseks kasutada.

Järgmisteks mõõdetavateks värbamisetappideks olid planeerimine ja intervjueerimine − 33,3% ettevõtetest jälgis nendel etappidel mõõdikuid. Planeerimisetapis oli kõige jälgitavam mõõdik värbamise aeg. See näitab, kui kaua veedab kandidaat aega protsessis enne, kui ta tööle võetakse. Analüüsides nii tervet protsessi aega kui ka iga intervjuuetapi aega, saavad värbajad teha muudatusi protsessi kiiremaks muutmiseks. Intervjueerimisetapis olid kõige mõõdetumad

mõõdikud kandidaadi rahulolu ja NPS mõõdik, kandidaatide lehter ja samuti töölevõtmise aeg. Kandidaadi rahulolu ja NPS annavad teada, mida kandidaadid värbamisprotsessist arvasid ning intervjuu protsessi saab vastavalt tagasisidele muuta. Kandidaatide lehter näitab detailselt, kui paljud kandidaadid liiguvad igas intervjuuetapis edasi. Kui näiteks leitakse, et suur hulk kandidaate langeb ühes konkreetses etapis välja, siis saab uurida, kuidas parandada intervjuu protsessi, et mitteedukaid kandidaate varem tuvastada.

Uuringu peamise tulemusena selgus, et ettevõtted, kes on teinud andmepõhise otsustamise oma strateegiaks, on oma värbamisprotsessi muutnud oluliselt efektiivsemaks. Näiteks ettevõtte nr 6 palkas kuus korda rohkem inimesi sama aja ja ressurssidega pärast andmepõhist otsustamist. Ettevõtte nr 10 kõrvaldas mittekvalifitseeritud kandidaadid protsessi alguses, säästes intervjuudele kulutatavat aega. Firmades leiti, et andmete kogumiseks kulub palju aega selleks, et saada head ülevaadet olukorrast ja sellest tulenevalt hakata muudatusi tegema. Hea andmekogumise jaoks on vaja head ATSi (*applicant tracking system*), mis võimaldab üksikasjalikku aruandlust. Uuring näitas, et kõige paremad tulemused olid neil ettevõtetel, kes olid andmepõhist otsustamist praktiseerinud mitmeid aastaid.

Uurimistulemuste põhjal soovitab autor kõikidel ettevõtetel teha strateegilisi andmepõhiseid värbamisplaane, olenemata sellest, kui kiire on nende ettevõtete kasv. See aitab ettevõtetel muutuda värbamisel proaktiivseks. Selleks, et andmetest kasu oleks, on vaja palju andmeid, mida saab koguda pikema ajaperioodi vältel. Kasulike andmete saamiseks on oluline kasutada head ATS-i, mis võimaldab kerget aruandlust ja analüüsi.

Autor leiab, et edasiste uuringute jaoks on palju võimalusi. Näiteks saab uurida erinevaid mõõdikuid ja nende võimalusi rohkem granulaarselt. Samuti võib uurimistööd laiendada palgatud kandidaatide kvaliteedi mõõtmisele − kuidas kasutada andmeid, et tuvastada efektiivsemad töötajad värbamisprotsessi alguses jne. Täiendavate uuringute tegemiseks on arvukalt võimalusi.

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APPENDICES

Appendix 1. The organisation data and interview length

Company	Organization	Company age	Size	People hired last year	Interview length
No 1	International Startup	< 1 year	> 15	> 10	31:34
No 2	International Startup	> 3 years	> 200	> 200	29:23
No 3	International Startup	> 5 years	> 200	> 100	34:46
No 4	International Startup	> 10 years	> 50	> 20	28:19
No 5	Local Startup	> 5 years	> 50	> 10	23:54
No 6	International Startup	> 5 years	> 200	> 200	42:13
No 7	International Startup	> 3 years	> 200	> 100	34:18
No 8	International Corporation	> 10 years	> 2000	> 200	44:29
No 9	International Startup	> 3 years	> 100	> 50	34:42
No 10	International Startup	> 10 years	> 50	> 10	35:23
No 11	International Startup	> 5 years	> 50	> 10	34:52
No 12	International recruitment agency	> 1 year	< 15	> 20	Email interview

Appendix 2. Interview questions

1. How old is your company?
2. How many people do you currently have?
3. How many people did you hire last year?
4. How many people do you plan to hire this year?
5. What metrics do you measure and what is the database you are using for them?
6. What do you do with the input you get from the data?
7. Can you bring examples when you have made decisions based on the data?
8. What was the impact of the decisions and how the metrics have been improved over time since you start tracking them?
9. How do you know what is a good thing to measure?
10. Can you give an example how the metrics have changed since you started using data to make decisions?

Appendix 3. Recruitment process together with metrics and databases

Step	What metrics can be measured	Databases to track the metrics
Identifying hiring needs and planning	Time to hire	ATS
	Time to fill	ATS
	Employee turnover rate	HR systems (Navision, Directo)
	Candidate pipeline conversion	ATS
Planning (timeline, recruitment plan, interview steps - depending on the hiring needs - backfill, expansion, etc.)	Time to hire	ATS
	Time to fill	ATS
	Candidate pipeline	ATS
	Candidate NPS and feedback	ATS/Survey tools like (Surveymonkey)
Creating job advertisement and choosing channels	Feedback from candidates and coworkers	ATS/survey tools like (Surveymonkey)
	Source of candidates	ATS
	Headhunted messages response rate	ATS/LinkedIn
Interviewing	Candidate pipeline conversion	ATS
	Time to hire	ATS
	Candidate NPS and feedback	ATS/survey tools like (Surveymonkey)
Hiring	Candidate feedback and NPS	ATS/survey tools like (Surveymonkey)
	Offer rejection reasons	ATS

Appendix 4. Metrics used by recruiters in each recruitment stage

Recruitment step / Company	Identifying hiring needs	Planning	Creating job ad and choosing channels	Interviewing	Hiring
No 1	Time to hire Employee turnover rate	Time to hire	Source of candidates	Candidate feedback (NPS) Pipeline conversion Time to hire	Rejection reasons
No 2	-	-	Source of candidates Response rate	-	-
No 3	-	Time to fill Time to hire Pipeline conversion	Source of candidates	-	-
No 4	-	-	Source of candidates	-	-
No 5	-	-	Source of candidates	-	-
No 6	Employee turnover rate Number of hires	Time to hire Time to fill	Source of candidate From click to application	Candidate feedback Pipeline conversion Time to hire	Rejection reasons
No 7	-	- Will start tracking: Time to hire Time to fill	Employee feedback on the job advertisements Also will start tracking: Source of candidates	- Will start tracking: Time to hire Interviewer Quality	- Will start tracking: Rejection reasons

Recruitment step / Company	Identifying hiring needs	Planning	Creating job ad and choosing channels	Interviewing	Hiring
No 8	Turnover rate before probation\n\nTurnover before 1st year	Time to hire	Source of candidates	Candidate feedback	-
No 9	-	Time to hire	Source of candidates	-	-
No 10	Employee turnover rate	Time to fill\n\nTime to hire	Job description analysis\n\nSource of candidates\n\nResponse rate	Pipeline and conversion\n\nCandidate feedback\n\nTime to hire	Time to offer
No 11	-	Time to hire\n\nTime to fill	Source of candidates	Pipeline conversion\n\nCandidate feedback\n\nTime to hire	-
No 12	-	Time to hire\n\nTime to fill	Source of candidates	Pipeline conversion\n\nTime to hire	-

Appendix 5. In which recruitment steps companies are being data driven

Recruitment step Company	Identifying hiring needs	Planning	Creating job ad and choosing channels	Interviewing	Hiring
No 1	YES	YES	YES	YES	YES
No 2			YES		
No 3		YES	YES		
No 4			YES		
No 5			YES		
No 6	YES	YES	YES	YES	YES
No 7					
No 8	YES		YES		
No 9					
No 10		YES	YES	YES	YES
No 11					
No 12			YES	YES	
% of companies being data driven	**25%**	**33,3%**	**91,6%**	**33,3%**	**25%**

Appendix 6. How many companies are being data driven versus how many thought are data driven in each step

Step:	Identifying hiring needs	Planning	Creating job ad and choosing channels	Interviewing	Hiring
Companies who though are being data driven	4	8	12	6	3
Companies who actually are data driven	3	4	11	4	3