



# DATA MANAGEMENT PROCESS FOR FAST-GROWING COMPANIES

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<p>Abstract:</p> <p>This thesis aims to describe how fast-growing companies can benefit from working with the data management process. This Thesis will as well aim to describe how the fast-growing companies currently work with the Data Management Process. The theoretical approach is to research prior studies done within the topic. This Thesis will aim to describe how the Data Management Process was created and the purpose of the process. The research is done by using a qualitative method, with a focus on the following three research questions.</p> <p>This Thesis is limited to the data management process and the respondent for the research has been selected from a need for collecting data for their external reporting.</p> <p>The results showed that the Data Management process, can save companies time and create cost savings, from manual work. According to the research, financial data is relatively easy to use for data management. But customer-related data seems to be more challenging. Due to legislation and data governance, that as well impact the possibility of sharing and storing the data.</p> <p>The Open Data concept has been effectively implemented in other industries. According to the research there is a common interest, to increase the way of working with data as an ecosystem. How companies can share and handle data in a compliant way. So that it can create a more efficient way to store and share data, so it is done according to the legislations.</p>	
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# 1 INTRODUCTION

The thesis research topic is focused on the data management process. How the data management process, can support the fast-growing companies within the growth and reporting for their stakeholders. Data can provide insight and statistics about the performance. As consumers, we can relate to the fast development within technology. Consumers are used to ongoing innovations driving new technological solutions. This same phenomenon is visible within data management, this can be seen in the usability of data and the legal compliance within regulations of handling this data. There are uncertainties in what data directions apply and how to collect data in a compliant way. Still, the world is currently developing into more global and digital, which offers certain possibilities for companies. There have also been changes in the regulation of how to collect data and store the data, that impacts the companies processes.

This research is studying the topic of determining the challenges and advantages within fast-growing companies data management process. The research will also bench-mark most common solutions, used by growing companies within their data management process. The concept of studying data has historically been more common within research and big corporates. But since the movement of Open Data in 2014, has led to the development of data tools and enterprises have become more interested in using and collecting data. Many companies may fail with an outcome of bankruptcy if they are not able to make the right decision in time. The market has developed and there has been an increase the competition. When a company starts to grow, there can be fast changes in their business and they need to act and optimize their cash flow. Data may provide companies the number, in a cost-effective manner. Data can provide companies insight into their economic development and data may provide them support for decision making.

## 1.2 The background of data process management

Every day there are many transactions made on the internet, this transaction transforms into data. From this data, companies can make analyses and receive valuable information from the data. Companies started to realize the value of using Open Data, to be able to make decisions based on data. This as well developed the companies processes into ways to work with the data management process. All the amount of data can cause challenges regarding the storage and usability of the data. As the amount of data has increased, the Open Data has transformed into Big Data, which is requiring different kinds of processes. The perspective started to become more relevant in the year 2008 when the financial crisis impacted the financial market. “The near-collapse of the world financial market 2008 “(Gurin.J. 2014, p.210) lead to” investors, business analyst and corporation demanding greater transparency from the companies they invest in. “(Gurin.J.2014,p.210)This has also lead to “government agencies have mandated financial and operational transparency”. (Gurin .J.2014, p .210)

The criteria’s of successful implementations are “ the volume and variety of data, the data management challenges and the wide range in the scale of datasets”(Gurin.J.2014, p.210) This has” established the need of new methods to control a large amount of data. “(Gurin.J.2014,p.210) The amount of Open Data, lead to many companies trying to find methods, how to use the data? More and more companies started to open their interfaces and share algorithms, that cost the data flow and business cases which was built from the use of data. From the point of” the data-revolution has created new business models and investment strategies allowing companies to monetize their existing data and to create new Big Data solutions” (Sedkaoui. S.2018, p.36)

When the amount of data increased, then the companies began to use this data for various business reasons. The amount of Open Data created a volume of Big Data, this created the definition of Big Data. Big Data created the challenge to interpret and analyze the context. The amount of data created challenges it to a more reasoned form. “Big data’s basic logic is to gather and analyze enormous quantities of data and then to use it for many different purposes” (Bendiek.A & Römer.M 2019, p.38)

Soraya Sedkaoui defined “Big data is a natural crop of the advanced digital artifacts and their applications.” (Sedkaoui.S, 2018, p.35) According to Sedkaoui the information, as well as Big Data was ” revolutionizing how intelligence is stored and informative analysis can be drawn. “ (Sedkaoui.S. 2018, p35) The data collection is a process, that consists of collecting the data and transaction. This is done by “sensors, mobiles and social media networks are examples of modern digital technologies that have permeated our daily lives. “ (Sedkaoui.S. 2018, p.35)

There are multiple ways to collect the data and various sources to collect it from. The data collection requires access to the tools and software that can collect it. There is “a large amount of digital data is being generated every day SME is usually close to its customers and clients and knows the source of data, the needs for data and the value of data. On the other hand, SME has disadvantages in dealing with Big Data.” (Wang.S. &Wang.H. 2020, p.882) Since the amount of data is increasing and the requirement for handling the data is developing. It is creating challenges for companies to adapt to the changes. These challenges can be caused the “cost pressure, and regulatory and customer requirement demand changes and cost reductions” (Groot.M 2017,p.228) For growing companies this can be challenging to choose the right method and tools, how to adapt their processes into a rapidly changing environment.

### **1.2.1 Aim**

The study aims to answer the question, how fast-growing companies can use the data management process for supporting their operational business? This is important because usually, fast-growing companies struggle with optimizing cost. If some risks occur, then the companies are highly fragile for liquidity and cash management risks. The aim is to bench-mark the most common data process solutions used by expanding and growing companies? Research what kind of economical and operational difficulties fast-growing companies now have and how the data management process could support fast-growing companies, to optimize their operations?

## **1.2.2 Limitations**

This study has been limited to companies that are currently growing and looking for sources of equity. The research is narrowed down to the data management process that has been selected, with the need for collecting data for an external entity. The research limitation will be to describe how the data management and the way to handle data, has changed from Open Data to Big Data. This research focuses on companies operational growth and current developments, impact on their data management. Since the access of data has been internationalized and it can be used for companies to find related data for their growth. These companies usually struggle with operative challenges within growing their business. To a previous study from, Financing small and medium enterprises in Asia and the Pacific Masato Abe the limitation of the studied companies was based of “(1) number of employees; (2) turnover of business; and (3) capital investments.”(Masato. A. 2013,p.3) “ This study is limited to companies with a certain “ maturity level.” (Coleman S. et al.2016,p.10) The maturity level is defined to a certain stage in their data process. Due to start-up companies may not have the same amount of transactional data and amount of data. The company needs to have a certain maturity level in the business.

## **1.2.3 Research Questions**

The heart of a qualitative study is the quality of the research questions used for the research. According to Dennis A. Gioia, Kevin G. Corley and Aimee L. Hamilton refer to the research questions as “We also pay extraordinary attention to the initial interview protocol, to make sure that it is focused on the research question(s), that it is thorough.”(Corley.G &Hamilton.A. 2013, p.19) Structuring the questions and forming them for the participants, is a mandatory process, to be able to prove the validity of the research. One method can be to do measures and to analyse the answers, by collecting the repeating schemes. The thesis focuses on the descriptive aim to answer the question of how companies consider the data management process and how are the companies currently working with the process? Does a good data management process improve the companies process and reporting for its stakeholders? Does a good data management process improve the companies processes?



## 2 LITTERATURE REVIEW

### 2.1. From Open Data to Big Data

This literature review begins by defining different kinds of data and how the amount of data has impacted the companies, as well as how it is impacting the companies? It can be reasoned, there is a lot of information available and there is a lot of information available. The problem is in finding it, or using it in a correct matter? This is a common problem, that consumers and corporates can relate to. According to S. Coleman. “business have just utilized data from the point of view of recording and monitoring transactions.”( Coleman S. et al.2016, p.4) From the point of Open Data was realized, the amount of data that needed to be monitored increased, impacting the datasets. “As the size of the datasets to be processed increases, they will take more time to analyze.” (Sedkaoui.S.2018,p.38)

In general, it is easy to find previous studies regarding the topic and there can be seen a rapid development within this researched topic. This thesis is based on reviewing articles and literature, based on earlier studies of the topic. In this research similar methods can be adopted and used for growing companies, by studying earlier studies done on the large corporation and data process management. The amount of data has made it more challenging to understand the data and to be able to interpret it, by making business decisions based upon it. Data can be both “structured and unstructured” (Sedkaoui.S. 2018,p.37) In the beginning most data was unstructured, but as the amount increased and regulations changed, companies had to structure the data. The unstructured data can create challenges in managing the data and interpreting it. When the data is being structured it can be divided into different categories. The first category is Metadata. Metadata is often referred to as “data about the data an accurate but not particularly useful definition on its own.”( McGrilly. D 2008, p.50)

The “Metadata can be found in physical data contained in software and other media..” (McGrilly.D. 2008,p.50) The “Reference data are sets of values or classification schemas

that are referred to by systems.”(McGrilly.D. 2008.p,48) After the company has structured their data, it is important to identify the Master Data, that can consist “, mandatory info: every bond must have a field coupon rate populated.”( Groot,M. 2017, p.186) this is an example of master data and it consists of the original data. The second group is “ Transactional data, restrictions customer of the certain category cannot trade certain products.” ( Groot.M. 2017, p.186) This is the more customer transactional data including transactional information.

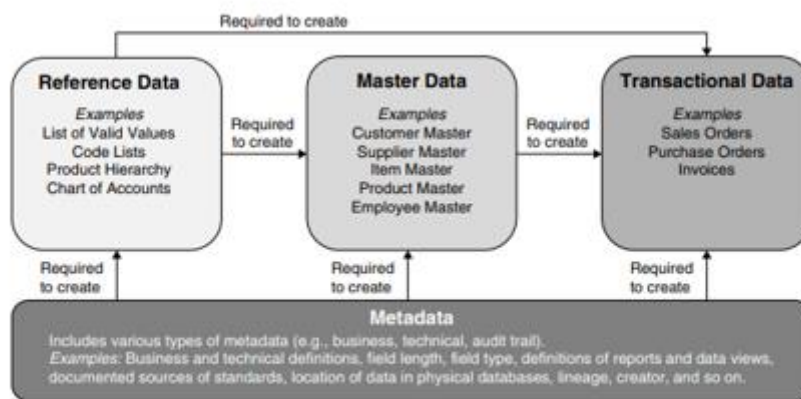


Figure. 1 The different types of data, by McGrilly. D 2008, p.44

According to Gurin, there are two requirements for solving problems and how to commercialize the use of data. Those he specified as “access to data and a network for collaboration.” (Gurin.J. 2014, p.158) Therefore “Open Data sharing as a condition of funding” is common within Medical research and innovations. But this happens as well within the more commercial industries. Gurin described the movement as ” Instead of trying to keep all this data secret, the new thinking goes, lets set it free.”(Gurin J. 2014 p 178) This is visible in media and journalism, where “journalist has learned how to analyse data to detect fraud, reveal government spending patterns, track demographic trends and more.”(Gurin J. 2014,p.199) According to Gurin, Open Data is divided into” seven key criteria for government Open Data.” (Gurin.J. 2014, p.21) The first criteria is “ Public, adapting a presumption of openness.”(Gurin.J..2014,p.215) The second criteria “

accessible, so it conveniently retrieved and searched.” (Gurin J 2014, p.215). The third criteria are “described that helps users apply the data is” the fourth criteria is “re usable under an open license.” (Gurin.J.2014.p,215) The criteria “complete, releasing the primary data. (Gurin.J.2014.p,215-216)

The “timely, as quickly as is practical” (Guirn.J. 2014,p.216) is a criterion for the release time for data. The last criteria is “managed post-release, meaning that there must be a point of contact.” (Guirn.J. 2014,p.216) that means it is necessary, there is a contact person” to help people use each dataset after it.”(Gurin .J.2014, p.216) In the year 2014 Gurin considered it “would do well to prepare ahead for this informational sea change” (Gurin.J.2014,p.103) In a scientific perspective, “access to data and a network for collaboration” (Gurin.J.2014,p.158) are the two main components in the industry development of data. The model is defined as “open innovations through collaboration.” (Gurin. J. 2014. p, 141) This has been used as a forum “to solve an important problem or set of problems.” (Gurin .J. 2014.p,141)

From the collaboration model, many business ventures and software developers started a more transparent way to collaborate. The aim was in giving value to the end-user which is companies, or private persons. The “broader awareness of the analytical value of data has been gaining ground in recent years and is reflected by the growing interest in business analytics. “(Coleman.S.etal.2016 ,p.4) The concept is used to understand datasets and it refers to” denotes the totality of data-based inference methodology used for the respondents of analysing, predicting and controlling processes in business and industry.” (Coleman .S.et al.2016,p.1)

One of the earliest methods of understanding data, was done by using Open Data from social media. The technology that was used for interpreting the data, was done by using Sentiment analysis to understand the context in the data. According to Gurin “sentiment analysis has the potential to turn social media into useful Open Data that can be analysed for more important marketing insight.” (Gurin .J. 2014,p.138) In these cases it could be used for “figuring when a tweet is straight forward and when it is sarcastic”(Gurin.J.2014,

p.137) Sentiment analysis has been as well used for security to “ detect potential terrorist activity.” (Gurin .J. 2014, p.138)

Social media started to build the amount of data and it started to be a way to use data. Many companies preferred data from social media, and it gave companies the possibility to use “diversified data can be collected by using social media. “ (Wang.S. &Wang.H. 2020,p.884) Still there are difficulties in accessing and analysing data.” There are many challenges of the use of social media data including highly unstructured data, noise, uncertain data sources and others.” (Wang.S. & Wang.H.2020,p.884) The amount of data gave companies more selection to data sources. They “ can either access data available freely on the internet or access mostly structured databases at a charge.” (Reinhold.M. &Reinhold.S. 2014, p.58)

As the amount of information increase and “ development of the web and the multiplication of data sources have generated a quantitative explosion of digitally created and shared data.” (Hassani.A. 2017, p.742) The amount of data started to increase and become more challenging to analyse, “The business environment represents a large space where large amounts of information are added every minute. This evolution gives birth to a new paradigm called Big Data.”(Hassani.A. 2017,p.742) As the amount of transactions, information and data is increasing, due to the amount of data. “Big Data challenges cover not only the storage and management of a massive amount of data, but also the extraction of consistent knowledge from such data.”( Hassani.A et al.2017,p.743)

## 2.2 The Data Management Process

As the world is continuously developing, so are the technological solutions and the amount of Open Data that has been formed to Big Data. Big Data requires a more analytical approach to interpret. It also forms a legal matter, which needs to be considered. “ A good data management process begins with an understanding of the constraints on the data in terms of security, content licensing, retention requirements and privacy.”(Groot.M 2017,p. 181) According to the Finnish ministry” *Datan hallinta ja jakaminen yritysten kesken edellyttää tyypillisesti sopimuksellisia ratkaisuja* ” To manage and to distribute data between companies requires a contract related solution.”(Authors own translation. Paavola.H, Seppänen M, Eloranta.V 2021,p.160) Within data, there has been occurring development within legislation and technological solutions. As these variables are changing companies need to adapt to these changes as rapidly, as the changes occur.

This chapter will aim to explain, how companies define a process and how growing companies can be perceived to handle a process. The Finnish Ministry describes data relevance to be “Data on tulevaisuudessa yhä tärkeämpi raaka-aine taloudelliselle kasvulle.” Data will in the future be even a more important ingredient for the economic growth.” (Authors own translation.Paavola.H, Seppänen M, Eloranta.V.2021, p.19) This as well means companies need to be more aware of the process and have a strategy for managing data. As data is relevant for business operations, companies need to adapt to a changing business environment. When the technology is developing at a quicker frequency, it forces the companies to have a strategy and a process for data management.

Gurin described “the data management challenges and the wide range in the scale of datasets will open room for innovators” (Gurin .J. 2014, p.70) That innovations were the start of data solutions and commercialization of data. The data management process has been changing from the year 2014 to the present. The technological development and changing regulations, require larger enterprises to adapt to changes and consider how to adapt to new technological solutions in a compliant way. One factor has been moving from hardware to a completely digital environment. “When we move from hardware to

operating system, to file system to databases to application software, you get increasingly closer to business processes.”(Groot. M .2017,p.128) This is also becoming important for fast-growing companies, where the number of transactions is increasing. It requires the fast-growing companies to have a similar process and a strategy for data process management. From this perspective, it is considered “ data must be used to continue the execution of the business, as well as provide suitable knowledge to adjust processes with their business requirements and improve the overall business efficiency” (Hassani.A. 2017,p.744)

A large amount of data needs to be processed within the organization and it also needs to be implemented on a strategical and operational level. According to Hassani the data management process consists of data “generation, acquisition, storage and analysis” (Hassani.A.2017, p.744) Lila Rao-Graham was studying the process of how SME companies adapt to the changes, according to Rao-Graham “ For SMEs to survive and compete globally with larger, more well-resourced organizations, business agility is an essential capability. SMEs have an opportunity to combine agility with their natural flexibility as a distinctive competitive advantage.”(Rao-Graham, Maurice . McNaughton, &Mansingh 2019,p.6) According to Muryjas “Moreover, just like large companies, SMBs have to create their own business strategies, and then determine the level of their realization.” (Muryjas.P.2014,p.470) Handling such operative decision” requires defining and continuous measuring the metrics and key performance indicators, that will be the basis for future decision.”(Muryjas.P.2014, p,470) As data is relevant for companies decision-making, the companies need to have efficient methods for their data management process.

This is important because companies can react and form the right kind of strategies based on relevant information and for selecting the most suitable tools for the process. According to S.Coleman definition ”strategic decisions need to be made at an earlier stage, to operationalize the initiative and define the organizational model to be implemented.”( Coleman.S. et al.2016,p.10)

According to Coleman, the timing for the implementations of data management is necessary for the success of adapting to a new technical solution. S Coleman refers to “The maturity level of a company depends on its ability to effectively address and overcome the problems and challenges referred”( Coleman S. et al.2016,p.10) When the company develops into the appropriate maturity level, the company needs to evaluate its process for implementation of a suitable data management process. This” decision should be made regarding the degree of centralization of analytics activities in support of business processes.”( Coleman S. et al.2016,p.10)

According to Setmenharju, technology is a part of the companies success, in business development. “SMEs need to be innovative flexible and efficient and ideally IT innovation should contribute to that goal.” (Setmeharju R.2014, p.479) This as well provides challenges within their processes to choose the right software for their business model. “ SMEs, therefore have to carefully evaluate the fit between their processes and the process embedded in the software and make a decision to adopt.” (Setmeharju R 2014, p.479) The same element of technology is having an impact on the companies business processes. According to Klaus Schwab“ Agility has its roots in the software development discipline” (Schwab.K 2020,p.2) but nowadays it has increased and is more well know within “modern Human resource practitioners” (Schwab. K.2020,p.2) and can be more generalized within the different size of companies. Especially among companies who consider it as “ Encouraging a fail-last, learn fast culture”(Schwab.K.2020, p.2)

This process impacts the companies decision-making within software investments and IT Infrastructure. According to Seetmenraju “SMEs need to be innovative, flexible and efficient and ideally IT innovation should contribute to the goal”(Seetmrāju.R 2014, p .480) This also creates the companies a challenge to determine, the most appropriate IT-strategy. Since the “ strategy of an SME should define end-user computing policies, IT ethics code, intellectual property ownerships and approaches to protecting the firm and customer information. “(Wang.S & Wang.H 2020,p.883) This may require a lot of resources, which can be hard to resource in a growing phase.

But for the company's development, the structure needs to be considered so the companies can quickly react and make the right business decisions based on data. Since innovations have a consequence on companies processes and it impacts their decision making, Coleman recognized the possibility for smaller companies to be able to adopt the large corporations methods in data management. Coleman considered "the open innovation concept offers an information exchange framework that can complement the SME's organizational model. "(Coleman S. et al.2016 ,p.10)

This ideally can provide a better structure for the companies development. As the technology is becoming more centric for companies "it is clear that the learning curve and the ease of use of software tools as well as technological infrastructure should be carefully evaluated." (Coleman.S. et al.2016, p.7) But the right IT- infrastructure also requires personal, with the right kind of knowledge and skills to implement it within the organization. According to Barberis, J., & Chishti, Small and medium-sized companies

" talent pools are shallower and their needs less complex than large enterprises, so they rely on outsourcing expertise. They are willing to try new tools that will have a tangible impact on their business."(Barberis. J.& Chishti, S. 2016, p.123)

The authors mention agility and cash-flow management to be a centric part of the success within SME companies, that are growing. According to the authors "Good financial advice can make or break an SME" (Barberis, J., & Chishti, S.2016, p.124) According to Barberis & Chisti " A typical factor in companies, that are phasing large changes, is the relation to resourcing. This is visible in companies, phasing large changes" (Barberis, J., & Chishti, S. 2016, p.124)" In typical SMB the same employees are often engaged in many business activities. They have limited abilities to play a wide variety of business functions and do different jobs at the same time." (Muryjas.P.2014,p.471)

This can have an impact on resources as well as reflect the principles of how companies collect and use the data. According to Coleman, there is a challenge in " the process of producing valuable information for end-users." (Coleman S. et al.2016, p.4) This has an



impact on the business process of “information transformation cycle that is, capturing data, analysing information, aggregating and integrating data, using insights to guide future strategy and disseminating information and insights.”( Coleman S. et al..2016,p.4)

## **2.3 Choosing the right strategy for Data Management Process**

As we are moving towards a more digital era, the form of data and the process of handling data on an international level has changed. Companies need to consider and select a suitable data management process, which can support them in scaling their business abroad. As the number of transactions will increase, the transactions need to be monitored in a legal matter. Agility is mostly associated with SME companies, but since the current market is continuously changing, agility can be adapted to other sized companies as well. According to Lia Graham SME companies adopted the definition agility for “ they have begun to make extensive use of these techniques to ensure the kind of agility that will endow them with the organizational capability to sense and respond to opportunities and threats in an increasingly dynamic business environment.”(Graham.L 2020, p.13)

Since the dynamic business environment is becoming more a global term. It requires companies to use agile methods, to implement new development. Traditionally, as most companies start to grow, the choice of the right strategy becomes important. As earlier mentioned, agility is a definition used by most SME companies, but now common within growth companies. The options which can be proceeding in expanding internationally varies a lot between the companies model and vision. The methods to expand can be by listing to the stock market or looking for finance from venture-capitalist, or other financiers. To be able to address investors, it requires transparent and easily used reporting based on data. Data can also be used for following the development and profitability of sub-diaries. Data can as well be used for insight into a new market and the market share, which can be market analysis data.

One element that impacts scaling domestically, is the current situation in the market and the competition within it. This can prevent companies from becoming too dominant in their market and it may prevent them from merging into similar companies on the domestic market. “Competition policy may, however, in some situations also be seen as a barrier or impediment to internationalization.”(Sliwinski.R & Sliwiska.M 2016, p.7) Companies must therefore adjust their actions to” internationalization or growth in foreign markets to existing antitrust laws”( Sliwinski.R & Sliwiska.M 2016, p.16) , While growing their market share and finding new potential markets “their product and technology must be concluded as the most important factors( Sliwinski.R,& Sliwiska.M 2016, p.16) While looking for new potential markets, companies need data to give them information about the new market and to analyze their options.

There may also be other reasons leading them to expand their business. Reasons as “activities of a domestic client, either a local firm or a subsidiary, led to rapid internationalization because of existing relationships with affiliated subsidiary in other countries or other clients/ supplier network.” (Nummela, N. 2010, p.186) This can be noticed within “International growth of small and medium enterprises” (Nummela, N. 2010, p.185) From a data perspective, there is a legal perspective to be considered in processing data. “Conflicts on international data protection occur across the Atlantic, between the two biggest economies and trading partners of the world (Bendiek.A & Römer.M. 2019, p.33) This is one perspective, that needs to be considered in international expansion. From a data perspective, this is relevant in “exchanged by digitally networked products, such as fridges and thermostats, on the Internet of Things requires free international exchange. “(Bendiek.A & Römer.M.2019, p.34) These laws are being harmonized, but this is a matter which needs to be addressed in international expansion. If the process is not done correctly, the company can phase security and legal issues in processing the data.

The American and European governments are working to improve this process, especially in the European Unions. The government is working on“international agreements to ensure that EU customers’ data is also protected when processed abroad, outside of its own jurisdiction” (Bendiek.A & Römer.M.2019,p.36) As we are moving towards a more

digital era, from the era of handling and trading goods. This legislation of international trade is being implemented in “Many aspects of trade in digital services touch on questions of data protection in dimensions that were inconceivable.” (Bendiek.A a & Römer.M. 2019, p.39)

When a company expands, they are required to recruit the right skill for their expansion. The personal and financial resources can be limited and challenging due to resources among smaller companies. The larger corporations have resources and are “acquiring their skills by buying up smaller analytic and data handling firms or are forming strong alliances with these organizations.” (Coleman.S. et al.2016,p.10). From a data perspective, this is efficient if the local provider already has their data protection legislation and knowledge. There decisions that can be made based on data patterns and it can give the company insight for better judgment. As the world is becoming more digital and the amount of data and transactions are increasing.

There is a need for a transparent way to handle and collected the data efficiently. The data management process can be a valuable method for this process. By saving current resources and supporting decision-making in the company. If the companies are expanding internationally, they need to consider the most suitable data management process and to consider the local data governance.

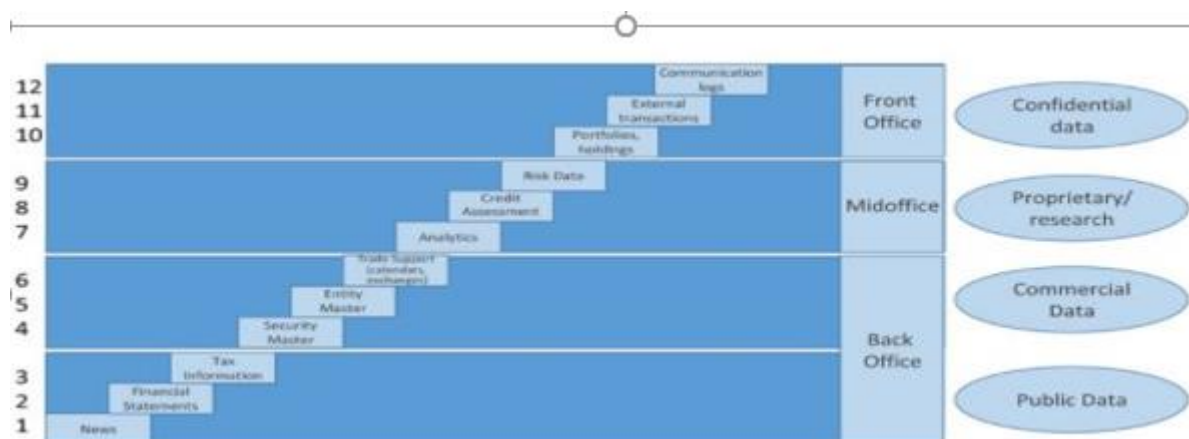
## **2.4 Data Governance**

As the amount of data transformed to Big Data, regulations form a certain criterion in the data process management. From storing the data to collecting and securing it. According to Sedkaoui, S “Managing large and rapidly increasing volumes of data has been a challenging issue for many decades.”(Sedkaoui, S. 2018,p.38) As digital solutions and technology are rapidly developing, it can be difficult for companies to asses’ rights methods of storing information and how to implement new solutions. As the amount of data grew, it developed a Data Governance method to ensure the quality of the process, with the purpose to “ensure all relevant stakeholders to present business, operation, IT, risks and finance to share joint resources.” ( Groot.M 2017, p.229)

The process consists of “setup and configuration to database administration and management. “(Coleman S. et al.2016,p.8) According to Groot, the “data governance means putting functionality in place within the existing organization hierarchy. “(Groot.M. 2017,p.290) When it has been established “ the goal is the optimal use of data assets through a shared understanding.”(Groot.M.2017,p.291) There are several different departments and persons involved in the data management process, it needs resources and personal to administrate it and qualify it. According to the Finnish Ministerie research.

” *Nykyinen lainsäädäntö ja regulaatio tavoittavat datatalouden ilmiöt huonosti, mutta yksinkertaisia tai suoraviivaisia ratkaisuja niiden kehittämiseksi ei voida antaa.* The current legislation and regulations implements poorly the data economical phenomens, but it simplifies but it can not get more strict solutions for developing it”( Authors own translation.Nummela. N. 2021, p.182)

The figure below demonstrates different departments, which are involved or can be involved in the data management process.



*Figure 2 The departments involved in the Data Process management Groot. M 2017 The Data types.*

The larger enterprises have been using data management systems for a longer period. The main function of the data management system is “to feed business users and applications with timely quality data to make them optimally productive. (Groot.M. 2017,p, 250) The “Enterprise data management is the practice that overlays the storage technologies with a data sourcing, quality management and controller distribution process” (Groot.M. 2017, p.5) As the solutions can differ in accordance to the companies internal policies, the “best value for money operating model that serves the best cost-effectively “ (Groot.M. 2017,p.292) Smaller companies may not have the same amount of internal resources to invest in a similar process.

This kind of solutions “should be given to software solutions that do not require special skills to put them to work. “Coleman S. et al.2016,p.8) This has caused similar problems for larger companies as well, due to “issues related to scalability, heterogeneity, quality, timeliness, security and privacy” (Sedkaoui, S. 2018,p.37) From a legal perspective, “due to regulatory interventions, there is a larger awareness of operational risks and the potential for fraud that poor data

management creates.” (Groot.M.2017,p.228) The issues impacting the implementations were variables costing of “IT, data analytic intelligence, organizational structure, managerial models, capital structure and requirements, consulting, labor market, data security and legal aspects.” (Coleman S. et al.2016 ,p.12)

These costs will impact how companies do their governance of data. The problem” of acquiring, integrating, cleansing, storing and publishing processed data has led to an enormous cost and poor service to end-users” (Grott.M. 2017,p.227) The problems can be separated into software and personal resources. These resources can require large financial investments, that smaller companies “cannot afford large teams, and hence, these skills should be guaranteed by.” (Coleman S. et al.2016,p.8-9) Secondary there be difficulties regarding the budget, due to the estimates are mostly tailored made, this lead

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to it being “ difficult to estimate the effects of different potential configurations on task and computation time.” (Coleman S. et al.2016,p.8)

It can lead to problems of implementing the systems since most “SMEs, which work with limited budgets and expertise.”(Coleman.S. et al.2016,p.8) This could lead to “undercapitalization is a common problem of SME. “( Wang.S.&Wang.H.2020,p.882) Impacting the quality of the solution due to” SME often have insufficient IT resources for data collection and data analysis. “(Wang.S. and Wang.H, 2020,p.882) After the systems are in use, the following process with the data, is to collect and store it. From the amount of data, it will become challenging to interrupt the data and to obtain the quality of data. Since the amount of data has increased, it needs to be modified for use and sorted in a logical matter. According to Michael Reinhold, Stephan Reinhold the growing companies need to collect the data as well. In some of the cases Small and medium-sized companies “ database of past and ongoing transactions is usually considerably smaller than the ones of larger corporations” (Reinhold.M, &Reinhold.S. 2014,p.55)

#### **2.4.1 Methods to storage data**

When companies start to collect data it is important to consider “ a challenge relative to the availability of data”(Coleman S. et al.2016,p.8) and what kind of data can be used. According to Gurin “ researchers are using data hives to work with massive amount of Open Data and learn what it can tell us”(Gurin J.2014,p.149) “The “ data hive model engages volunteers to improve the quality of Open Data or process it.”(Gurin. J. 2014. p,148) One problem that occurs is “SMEs often do not have well-organized databases or data warehouses themselves” (Härting .R .2019,p. 1538) So there raises concerns of how to store and implement data solutions. According to Rick Sherman, one main goal within data warehousing is “centralizing data in what would years later be referred to as the single version of truth” (Sherman.R 2014, p.109)

From the concept of Data Warehousing “The next era was the rise of data marts. Data marts promised to be quicker and cheaper to build“ (Sherman.R. 2014, p.110), but as the “Business people started debating the numbers in meetings and spent increasing amounts

of time reconciling the data between reports that were generated from different independent data marts.” (Sherman.R.2014, p.113) The challenge was, that most companies needed more centralized methods, for storing the data and able to access the data. The” Operational Data Store -ODS .”(Reinhold. M &Reinhold.S. 2014,p.113)The ODS was developed for the purpose to centralize the data it “ was to bring data together from multiple source systems on as close to a real-time basis as possible to enable specific business processing or operational reporting.” (Reinhold.M.&Reinhold.S. 2014, p.113-114)

Reinhold considers it to be tempting for companies to” mine-free, unstructured data themselves” that can also be defined as Open Data. But “the necessary software and hardware infrastructure required to discover meaningful patterns in large data volumes are too costly” (Reinhold.M.& Reinhold.S 2014,p.58) The companies need to invest in a system capable to manage the dataset. The challenge behind this is according to Setmenharju article “ a potential concern for SMEs is that the data and system is completely stored and managed by the SaaS ERP software.” (Seetmhamraju R 2014, p.478) According to Seethamraju “managing this risk is a challenge for many SMEs” (Seetmhamraju R. 2014, p.478) One of the main risks can be” Data security is a major issue that is particularly related to the adoption of cloud infrastructures.”(Coleman S. et al. 2016,p.7) There is as well an issue relating access” it may be difficult for the user organization to check effectively the data handling practices of the provider.” (Seetmhamraju.R. 2014 ,p.478)

”security and technology-related factors such as data security, privacy of data system reliability, lock-ins, scalability, fear of service disruptions, ongoing service support, difficulties of integrating with other existing applications, poor internet bandwidth in certain areas and inadequate supporting of IT infrastructure are key factors, that could limit the adaption and use of cloud services in general” (Seetmhamraju R 2014, p.479)

This may also depend on “ IT infrastructure and the readiness of the firm do not appear to be significant factors influencing the adaption decision”( Seetmhamraju R 2014,p. 479) This variable still have a big impact on the adaption of systems and according to S.Coleman et al “Providing solutions to such issues can remove the technological barriers and leverage the adoption of Big Data analytics in the SME. “(Coleman S. et al.2016,p.7)

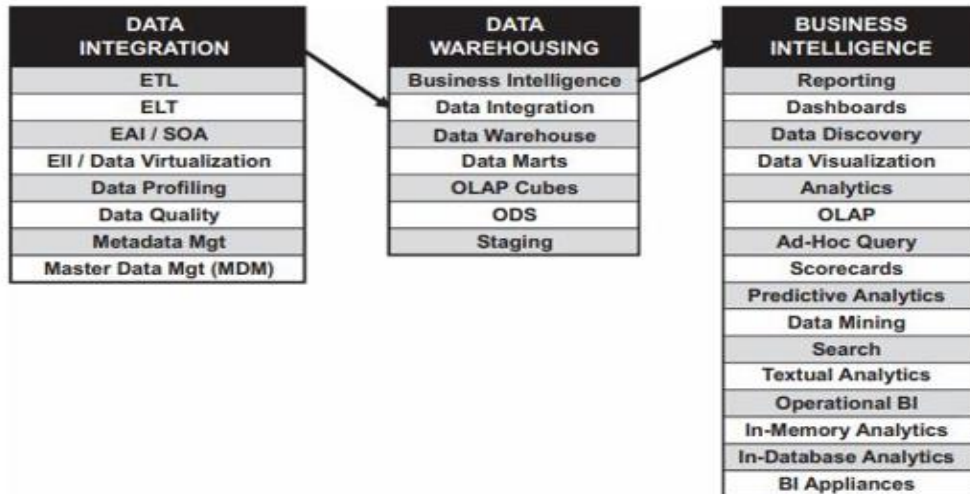


Figure 3. The process behind Data Integrations. Rick Sherman, *Business Intelligence Guidebook : From Data Integration to Analytics How BI, DW and DI fit together . 2014*Page 15.

There is a legal perspective to be considered in data use and the protection of the data. This shall always be defined in agreements regarding data use. According to a journal by Digital Policy, Regulation and governance “the growth of the internet has enormously expanded the importance of data transfer and the trade in services involving data protection” (Bendiek.A & Römer.M 2018, p.34) As previously noted, data warehousing and storage the data, is defined as one part of the process within the use of data. There are still parts that according to the journal, can be argued to need more clarification “ Today, the coordination of the various national data storage regimes is rudimentary or non-existent, and their relationship to international trade law is unclarified.” (Bendiek.A & Römer.M. 2018 ,p .39) The concern most companies have is data breaches of their owned data. " Proprietary data transferred to external storage systems can be a concern, especially when the data contain sensitive information. (Coleman.S. et al.2016 ,p.7)

According to the journal “New data protection and security requirements will promote IT products whose technological configuration facilitates the protection of private data,” (Bendiek.A & Römer.M.2018, p.37) Legally, this is an ongoing process hence” Every four years, the Commission must re-evaluate the agreements, ensuring that protection levels have remained adequate. (Coleman S. et al. 2016, p. 3) In a longer period, this may



also create large costs for companies and ongoing software costs and updates. According to Seetmenharju “failures and high initial and ongoing cost, small and medium-sized enterprises” (Seetmenharju.R.2014,p.475) In the previous research Seetmenharju already stated that “dramatic changes in the technologies and competition forcing many SMEs to adopt better technology.” ( Seetmenharju. R. 2014,p.477) Big Data is continuously driving companies to implement better technology.

## **2. Data management solutions**

The process of data collection, is a important stage in the data management process. Data plays an important role in organizational systems. “Nowadays, the technological environment involves the interaction between several external and internal information systems” (Hassania.A & Gahnouch .S. 2017, p.742). After the data have been collected, the usability of it improves. The way how to understand the data is done by analyzing it and categorizing it. The “data analysis is a process that transforms a mass of information into structured information allowing decision-making. “(Hassania.A &Gahnouch.S 2017, p.743)‘The first subcategory is “descriptive analytics summarise, condense and aggregate data in a way to make big and complex data sets more easily accessible” (Coleman. S. Göb.R, Manco.G. Pievatolo.A., Tort-Martorelle.X and Reis. M 2016, p.1.) The second way is to use the data for the future, by “enable forecasts of future effects based on historical data.”(Coleman.S. et al 2016, p. 2) After the data has been modified to be understandable, then it can be used for business decisions, by modifying it.

It is required to have a solution to analyses it, the ” prescriptive analytics transforms the results of descriptive analytics and predictive analytics into business decisions” (Coleman S. et al.2016,p.2) The sources of data may nowadays vary a lot, S.Coleman et al, lifted some data sources” human-sourced “representing records of human experience such as e.g., social network data. “ (Coleman S. et al.2016, p.9) This data can be produced by open sources. By a system can be produced “process-mediated coming from traditional business systems, such as, e.g., medical records or commercial transactions.” (Coleman

.S. et al.2016,p.9) The last source mentioned is “ machine-generated representing measures and events from the physical world. “(Coleman S. et al.2016, p. 9) This can be collected from more operational systems as ERP and then modified by Business Intelligence software. When companies use different solutions to understand data, it “ means that consolidation over multiple sources of reference data is a matter of comparison” (Groot.M. 2017,p.72) The situation has caused multiple sources to collect data from and a more centralized source for data, so companies have multiple software and sources to collect data from. According to Coleman. “Market studies expect an annual growth rate of the global SME Big Data market by 42% over the period of 2013 until 2018.”( Coleman S. et al. 2106, p, 2)

This amount has been increasing, over the years” however, because they are starting from a drastically low level, Big Data adoption in SMEs will continue to lag behind the evolution in large companies.“(Coleman S. et al.2106, p.2) One of the objects studied in this research, is what the most common systems are within the field of data and how the companies use these systems? The technological development modifies the service models for companies, to fit their needs. “ Software as a service allows an SME to have complete business applications in the cloud.” (Wang.S &Wang.H 2020, p.885) The “Platform as a service can provide development tools for SME to develop special apps and to deal with Big Data in the cloud. ” (Wang.S & Wang. H. 2020, p.885)

The last model, which reflects more to the companies business process and strategy is “Infrastructure as a service allows an SME to build a system, including hardware, servers, data storage and networking components.” (Wang.S & WangH.2020, p.885) This model still needs the data, as a fuel to feed the service models. When a company begins to grow, it as well requires a system that collects this data. Michael Reinhold, Stephan Reinhold year 2014, made a study regarding the most common systems used by Small and medium-sized companies. One of the findings Reinhold & Reinhold made in their study is “ systems thrive on large databases of past transactions.”(Reinhold.M.&Reinhold.S 2014,p.53)

So most companies used historical data and it is a natural source of collecting the data. Since companies collect a lot of data, the value can consist of history data, which enables them to predict. Since the development of integrations and the more common use of open sources, company integrations are one variable. The “recommendation systems require ongoing integration of structured and unstructured data.” (Reinhold.M. & Reinhold.S. 2014, p.54) This is relevant since the right data flow needs to be considered between systems. This has as well developed easily manageable systems and methods of storing the data. According to S. Coleman” SMEs can take a lot of benefits from embracing business cloud solutions, the most important being access to extensive environment.” (Coleman S. et al.2016, p.6) The key variables listed in implementing data software’s for “SME to make the correct decision based on affordability, privacy and security concerns.” .Coleman. S. et al.2016, p.7) These are variables that can be valued by growing companies as well.

### **2.5.1 ERP Systems supporting Data Collection**

One common system among companies and the data is ERP systems. According to Ravi Seethamraju “ Enterprise Resource Planning is considered the best opportunity to take advantage of the capabilities of an ERP system without the investment and management costs associated with the on-premise model.”(Seetmenharju R 2014,p.475 ) The processes can still be time assuming for companies “money spent on large-scale processes, such as ERP and CRM is wasted if the data is not trusted.”(Groot M. 2017 ,p.229) Seethamraju considers the reason for this to that the ERP” systems are now offered on the cloud under the Software as a Service model. For small and medium-sized enterprises ”(Setmenharju..R. 2014 ,p.475)

“Due to the intensity and ability to adapt quickly to changes. ERP systems provide companies a lot of operative data and cloud services provide the company more room, to grow faster. Adaption of SaaS ERP systems could potentially contribute to improvements in decision making, process improvements innovations and firm performance” (Setmenharju.R 2014,p.479)

According to Setmenharju the benefits of” ERP system through a centralized enterprise-wide database, delivers necessary data in real-time.” (Seetmenharju.R.2014,p.479) According to Ravi Seethamraju” SaaS ERP systems offers an attractive option to SMEs to counter their problem of resource constraints and the complexity of business processes. “(Seetmenharju 2014, p.475) Internally companies will have better access to their data, it will support the companies in gathering the data. The” SaaS based ERP solution can deliver real-time data, visibility and standardized processes and information.” (Setmenharju.R2015,p.489) According to Barberis & Chist “ CRM/ERP/accounting/data warehouse systems.”” (Barberis.J. & Chishti, S.2016, p.99) were the most used systems among SME companies.

### **2.5.2 Business Intelligence analysing data**

Business Intelligence is used as software that gives the possibility to modify data.” Tools for reporting and analysis are collectively called business intelligence BI.” (Groot.M 2017 ,p.135) It is also stated that” BI gives SME the opportunity to combine business agility with their natural flexibility” (Rao-Graham.L. 2019, p.5). Lia also refers that “ business agility is an essential capacity” (Rao-Graham.L. 2019, p.5) in utilizing Business Intelligence. To support the companies in predicting their business and to give a possibility to modify the data gathered, to be able to interpret the data.

According to Lila Rao-Graham “available digital technology options, the capabilities of BI are much more accessible to SME than before” “At the present, BI is in the focus of most SMBs because it, allows creating clear and deep visibility of particular business processes;reduces time spending on analytics;allows discovering new business opportunities.” (Muryjas.P. 2014, p,471) According to the study “BI renders that data gathered in IT systems gain a real business value. Managers can discover new previously unseen facts and opportunities. They can identify trends and patterns for markets and customers.“(Muryjas,P. 2014 ,p. 472) According to Piotr Muryas study BI Softwares are providing “recognizing and taking advantage of business opportunities (Muryjas.P 2014, p .475) by recognizing patterns in the amount data.

### 2.5.3 Process Mining supporting the data management process

One method to handle and to plan a process can be done by using Process Mining. “Process mining offers an innovative approach to analyze the performance of a process.”(Melo.P. &Carolina Machado.C.2019,p.3) Pedro Novo Melo; Carolina Machado. Process describes the process as” mining begins by evaluating established IT or business processes to find repetitive tasks that can be automated using technologies such as robotic process automation RPA, artificial intelligence and machine learning.”(White.S. 2020,p.1) Process mining software can help simplify process documentation and enable companies to make quick changes if new compliance regulations are introduced. Process mining software “can help simplify process documentation and enable companies to make quick changes if new compliance regulations are introduced. “ (White, S . 2020,p.1) The method of “Process mining is a methodology by which organizations collect data from existing systems to Responsively visualize how business processes operate and how they can be improved” (White. S. 2020,p.3)

The first process is “ Format data: This phase comprises checking the types of data the model can analyze as well as measures to identify outliers” (Härting R 2019 ,p.1539) After the data have been formatted. The model needs to be evaluated by.” ( Härting R 2019 ,p. 1539) the results. Before a Data Mining model can be applied to new data, its reliability must be evaluated.“( Härting, R.2019 ,p.1539) Then the final step of the process is “Report to decision makers” ( Härting R 2019 ,p. 1539)The advantages companies get, by “Process mining enables organizations to ensure automated processes are efficient, consistent and reliable.” (White.S.2020 ,p.2)The way how a company can use process mining is “with process mining, companies can enable automated decision making, simulate processes to predict future outcomes, identify gaps in organizational leadership and ensure implemented processes are continuously improved.” (White.S.2020, p.2) Some tasks in a process mining process is” standard tasks can be the grouping of customers, predicting customers’ behavior, sales predictions, or market basket analysis”

(Härting .R .2019,p. 1538) As in other mentioned data tools, the challenge within process mining tools, for growing companies is “every Data Mining project has an individual amount of costs as well as complexity, which is difficult to estimate in advance” (Härting. R. 2019,p.1538) This may lead to an uncertainty of using the tools and most companies need to invest more time in budgeting the costs, which may vary a lot due to “the transaction costs cannot be ignored and must therefore be included in the cost-benefit analysis.” (Härting. R. 2019,p. 1540)

## 2.6 Companies adopting to the Data Management Process

Data is relevant for businesses, but the useability can variate between the organizations. “Businesses used to be data constrained currently many businesses are at a risk of drowning in data”(Groot .M. 2017, p.68) This is developing the challenge in capturing and using the data “Organizations must be aware of new Big Data challenges and BPM capabilities to transform the massive amount of data to an actionable knowledge.” (Hassania.A. 2017,p .724) The Ministry of Economic Affair and employment of Finland published the research in 2021, Paavola.H, Seppänen M, Eloranta. V “*Datapohjaisen arvonluonnin strategiset vaihtoehdot.*”(Authors own translation Databased value creations strategic options” Paavola, Seppänen, Eloranta2021)According to the authors, “*datapohjaisen liiketoiminnan siirtymisen onnistuminen edellyttää tutkimuksen mukaan erillaisia kyvyksiä ja strategioita.*” Transferring to a databased business, requires different kind of skills and strategies” (Authors own translation Paavola, H, Seppänen,M, Eloranta.V, p. 12,2021)

The authors interview 12 companies, which all were large companies with a revenue of over 5 million Euro and they had been existing for a longer time. One of the findings in the research, was that “*Koulutuksella on tärkeä rooli datapohjaisen arvonluonnin edistämisessä.* Education has an important role in developing and furthering databased values.( Authors own translation Paavola, H, Seppänen,M, Eloranta.V.2021,p.177) In their research, they listed out 10 “*politiikka-suosituksia*” political recommendation” ( Authors own translation Paavola, H, Seppänen,M, Eloranta.V.2021,p.13) to be considered for the future.

*” Suositus 1: Tuetaan aitojen ekosysteemien ja kriittisen massan kehittymistä*  
Recomendation 1: Support real exosystems and critical mass development

*Suositus 2: Edistetään datan hyödyntämistä* Recommendation 2: Support the development of using data to support.

*Suositus 3: Arvioidaan alustaliiketoiminnan julkisen rahoituksen ja yhteiskunnallista vaikuttavuutta* ( Recommendation 3: Estimate platform businesses public funding and enviromental influence.

*Suositus 4: Tuetaan ketteriä kokeiluja T&K-rahoituksella ja luodaan innovaatioiden tukemisen uusia rakenteita* Recommendation 4: Support agile experiments R& D funding and create by innovations new structures.

*Suositus 5: Edistetään datatalouden kehittymistä koulutuksella* Recommendation 5: Prevent dataeconomics development by education

*Suositus 6: Vaikutetaan arvon jakautumiseen* Recommendation 6: Influence the distribution of value

*Suositus 7: Kehitetään data-ajan regulaatiota* ( Recommendation 7: Develope data-era regulations)

*Suositus 8: Vastataan tulevaisuuden tutkimustarpeisiin ja edistetään evidenssipohjaista päätöksentekoa* Recommendation 8: Answer to the future research needs and further develop decision making by evidence. “(Authors own translation Paavola, H, Seppänen,M, Eloranta.V, 2021,p.13)

From a business perspective, the business value can be divided into external and internal. But for both uses and perspectives “reliable, accessible data is arguably the largest common good in organizations.” (Groot, M2017, p.227) There are internal and external methods to ensure the data quality “internal audit, proof, or more importantly, regulation proof” (Groot, M 2017, p.181) which are methods to ensure the data quality. Data can give a lot of value for investors, to access economical figures, but as well internally. It gives the companies the possibility to follow data and make a decision based on “,huge amount of data gathered from the organization and its environment and the need to have highly skilled staff to analyse these data.” (Piotr Muryjas, 2014, p.470) When the company has a large amount of data, from a data management perspective the main challenge” is to join up all the data in the organization” (Groot, M 2017, p.152) But when the companies manage to join all the data together and to structure it right, then the data will provide clarity for them

The use cases for it can be used for “declining operational costs and higher productivity; improving decision processes; shaping the culture of better business data application; higher competition.” (Muryjas, P. 2014, p.472) According to Shirley Coleman, Rainer Göb, Giuseppe Manco, Antonio Pievatolo, Xavier Tort-Martorelle and Marco Seabra Rei “enormous amount of data is created worldwide every day. Much of this data is directly or indirectly relevant for policy and decision-making” (Coleman-S. et al.2016, p.1) As the amount of Open Data, formed into Big Data the advantage was for “enterprises by tapping into varieties and volumes of data can bring benefits by informing plans and decision-making” (Sedkaoui, S. 2018, p.35). This is the reason why “companies are devoting their resources and efforts to gain greater results by leveraging Big Data. (Sedkaoui, S. 2018, p. 35)

The value and the return of investment for managing the data are according to Coleman within “supply chains, manufacturing and service processes; company and customer management; financial and commodity markets: and macroeconomic development.” (Coleman S. et al.2016, p.4) Within these business processes, the data management savings can be made. The authors Shouhong Wang and Hai Wang found four main advantages, that SME companies can benefit from data. The first one is “to reduce costs



and increase profit through cost and profit analyses” (Wang.S.& Wang. H.2020,p.883) that is important for growing companies as well. The second is insight “ to improve customer services through customer’s purchase analyses” (Wang.S.& Wang.H.2020, p.883)

That can create a better insight on product pricing and marketplace. “To enhance marketing strategies through marketing campaign analyses;” (Wang.S.& Wang.H. 2020, p.883) The last reason found was “ to achieve sustainability through long-term risk analyses (Wang.S.& Wang.H. 2020,p. 883) The reasons are quite operative and this reasons may vary between growing companies, where they have already established their market-share. Rick Sherman stated in his book *Business Intelligence Guidebook : From Data Integration to Analytics*, that “raw data is unpalatable to the business person who needs it to make decisions.”(Sherman.R. 2014, p.3)

For this use case “you need data integration to unify, massage the data and data warehousing to store and stage it.”(ShermanR.2014, p.3). From this point, it will become more clear to use the data for decisions. As “they depend on data to validate their intuition, in this sense data becomes a strategic guide that helps executives to see patterns“ (Sherman.R. 2014,p.7). According to the authors Barberis, J., & Chishti, S. many SME company executives considered it to be “interesting to predict” (Barberis, J. & Chishti, S. 2016,p.99) from data. Data could be used to predict in the following business processes “Cash flows, The impact of volatile currency exchange rates, Demand of special products” (Barberis, J., & Chishti, S. 2016, p.99) This all variable seems to operatively being variables that determine the company success on a short period. From an economical perspective, the” Macroeconomic data. System users can be asked to give additional data such as geolocation” (Barberis, J., & Chishti, S. 2016 p 99) In the prior research of the Finnish ministry, the research introduced the definition Ecosystems, that was defined as.

*“Ekosysteemillä tarkoitetaan tässä selvityksessä liiketoimintaekosysteemejä. Liiketoimintaekosysteemi voidaan määritellä arvoverkostoksi, jonka yritykset tekevät yhteistyötä ja hyödyntävät toisiaan Ecosystems referred in this research as business ecosystems, business ecosystems can be defined as value chains, that companies can collaborate and utilize each other.” (Authors own translation Paavola.H, Seppänen M, Eloranta 2021,p.181)*

The Ministry recommends that *“Yhteistyötä ja vuorovaikutusta ennakoinnin suhteen olisi siis hyvä tiivistää ja tehostaa kansallisella tasolla. Tämä tukisi myös muiden politiikkatoimien kehittämistä. Collaboration and interaction could be done as prevention and it would be good to seal as well as to make it more efficient on a national level”* (Authors own translation, Paavola.H, Seppänen M, Eloranta 2021,p.185)

## **2.7 Value for the stakeholders**

Joel Gurin describes in his book *Open Data now*, Open Data as “ accessible public data that people, companies and organizations can use to launch new ventures” (Gurin.J. 2014, p. 267) According to Gurin the challenge behind Open Data is “ the volume of data and variety of data” (Gurin.J.2014, p.79) According to Gurin “today stakeholders want reliable Open Data, like the data that the government collects and releases”( Gurin.J. 2014, p.96.) This demand was established on the behalf of the financial regulators during the financial crises in 2008. There was a demand of “quickly come to meaningful KPI”’s shortcuts and information statistics that convey key properties of the complete datasets is even more valuable” (Groot.M.2017, p.109) The companies can also be more transparent by using data efficiently and provide value for external stakeholders. Stakeholders consist of investors or external financiers for the company. “Poor data management practices can be a major brake on integration and can even completely jeopardize a merger” (Groot M. 2017 ,p.109) According to Coleman, the companies struggle by reporting to” all stakeholders, namely, national and international policymakers, the IT community, the business management community and the data science community. “(Coleman.S. et al.2106, p.4)

When a company starts to grow, they start to look for external financiers, venture capitalist, or private equity financiers. As most investment decisions are made based on financial information.” In addition to improving its accounting systems, an SME wanting better access to credit can also look into going public” (Masato. A. 2012,p.9) Most companies do not have the resources to manage financial statements for their investors or additional board members. This can still create a challenge in attracting new stakeholders since companies internal do not have “the time, talent or money.”(Grooty.M. 2017 p 227)

For the shareholders will for obtaining a quality, can lead to “stakeholders involved in a project.”(Grooty.M. 2017, p.227) The shareholders criteria for the data can variate ” each department will demand a data service group that supplies their personal data needs.” (Groot.M 2017, p.228) In prior research done to find most criteria’s for SME investment to grow was “Maximizing working capital, lowering information asymmetries, developing capital markets, strengthening the bank-SME” (Masato A.2012, p.26) are stated as important for SME companies growth. For this reason, the companies need reporting systems and data that consist of this information. This has made it externally important for growing companies. According to Gurin” As investors look for deeper information on the companies” (Gurin.J. 2014,p.87) It can lead to” the investors investigate ” (Gurin.J. 2014, p.87) the certain companies.

“ Lack of risk management skills related to SME lending has contributed to significant non-performing loan (NPL) problems in the past, which demonstrated an inconsistency between commercial banks and SMEs, and discouraged banks from further lending to SMEs”( Masato.A 2012,p.10)

This is a reason why “ the need for financial institutions to provide more suitable products and services for SMEs, develop comprehensive risk management skills, and improve information transparency has been recognized.” ( Masato. A. 2012,p.10) When companies provide information for Stakeholders it is important to be answering “ What is this for me, question? Knowing how data literate stakeholders as well as their organizational responsibilities.”( Groot. M 2017,p .251) According to Gurin” The World Bank sees Open Data as a tool for economic development and is funding a number of projects.” (Gurin. .J .2014, p.229) Considering the past historical crises, as financial crises. Data can provide more value in predicting the impact on the market.“Small  
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businesses face a challenge in raising capital.”(Gurin. J .2014,p.88) Data can support the stakeholders risk management, by “raising the awareness of the politics to get the required support and to spot risks easily.” (Groot. M .2017,p .251)

According to Gurin the ” investors don’t want to put in the effort to assess their business potential.” (Groot M. 2014.p, 88) and“data will give potential partners and investors enough confidence in these SMES.” (Groot M. 2014 ,p.89) By providing the shareholders data, it can support and give better insight for “owners and managers a better visualization and understanding of dependencies and complexity, and also allow intuitive scenario planning.”(Christie.S & Barberies.J 2016,p.99) This can be crucial for fast-growing companies and it enables them to act fast and agile. According to “growing volumes of data flowing into enterprises and their complexity and disparity; – increasing demand for business information within the organization; – shrinking time window for making a decision. “(Piotr. M. 2014, p .470)

One example is” Smart Disclosure combines government data company information about products and services”(Gurin.J. 2014, p. 43-44) According to Joel Gurin” most will use this Open Data through an intermediary” ”(Gurin.J.2014, p.43-44) According to Gurin” Smart disclosure is designed to help to solve this problem with Open Data from government and other sources and choice engines make data usable. ”(Gurin J 2014, p 4.3-44) The aim of Smart Disclosure also “promises to provide new opportunities for the many entrepreneurs and start-ups to create new apps and services. ”(Gurin. J 2014 p.43-44) The services and apps could support companies to collect data. According to Gurin the data is not” just based on how its factories or facilities operate also reflects the entire supply chain. ”(Gurin.J 2014, p.103)

## **3 .METHODODOLOGY**

### **3.1 The structure of the research**

Finding the most potential target group was challenging. The subject was very interesting for most of the companies contacted. But participating in the research was challenging due to the timing. Due to the subject, it was important for the validity to find proper subjects expert. The difficulty is also to locate companies with enough transactions, that form data and that can be interpreted the data. Since Open Data was originally launched to increase transparency within investors and for growth companies to improve their financial reporting. It was important to find companies from different kinds of industries. The structure is based on describing the method of the research and then describe the data collection method.

### **3.2 Selection of method**

This research is done by a qualitative research method and the research is executed by semi-structured interviews. I want to gain an understanding of how data process management could support the fast-growing companies operative business? Therefore, I must be able to understand how fast-growing companies currently consider data-process management? Structuring the data involves “ Theory and research picking certain things out and putting them under some headings. “(Bryman & Bell,2011,p. 392) The research method used is interviewing subject- experts that have an insight of the data management process. The method is to build a certain interview pattern, that can be used for deep interviews. The interview duration is 40 to 60 minutes using the Gioia model to analyze the results in the interview. “The features that enhance qualitative rigor begin with our approach to analyses, especially in terms of organizing the data.”(Gioia. D Corley.K & Hamilton.A 2013, p.20)

The research is done by sending the question in advance and then done by semi-structured interviews. This method is done to achieve a better validity on the answers, by giving the participants time to prepare. The method is to create a qualitative research and find patterns as well as Respondents, which could support fast-growing companies' operative business? "According to narrate an informative story that is driving toward some new concept development and theoretical discovery with the careful presentation of evidence." (Gioia, D Corley, K & Hamilton, A. 2013, p.23) In this stage the authors' focus on highlighting those emergent concepts that are new and/or those existing concepts that have new twists that produce new insights". (Gioia, D Corley, K & Hamilton, A. 2013, p.24)

From the interviews, the analysis is done by finding patterns by the Gioia method. This method has been used in prior researches, where the research has been using a qualitative method. According to Dennis A. Gioia, Kevin G. Corley and Aimee L. Hamilton article Seeking Qualitative Rigor in Inductive Research: Notes on the Gioia Methodology The approach used is "a construct, however, usually is formulated so it can be measured; its primary purpose is to delineate a domain of attributes that can be operationalized and preferably quantified as variables." (Gioia, D Corley, K & Hamilton, A. 2013, p.16) As the authors describe "If the data structure is the anatomy of the coming theory, then the grounded model is the physiology of that theory" (Gioia, D Corley, K & Hamilton, A. 2013, p.24)

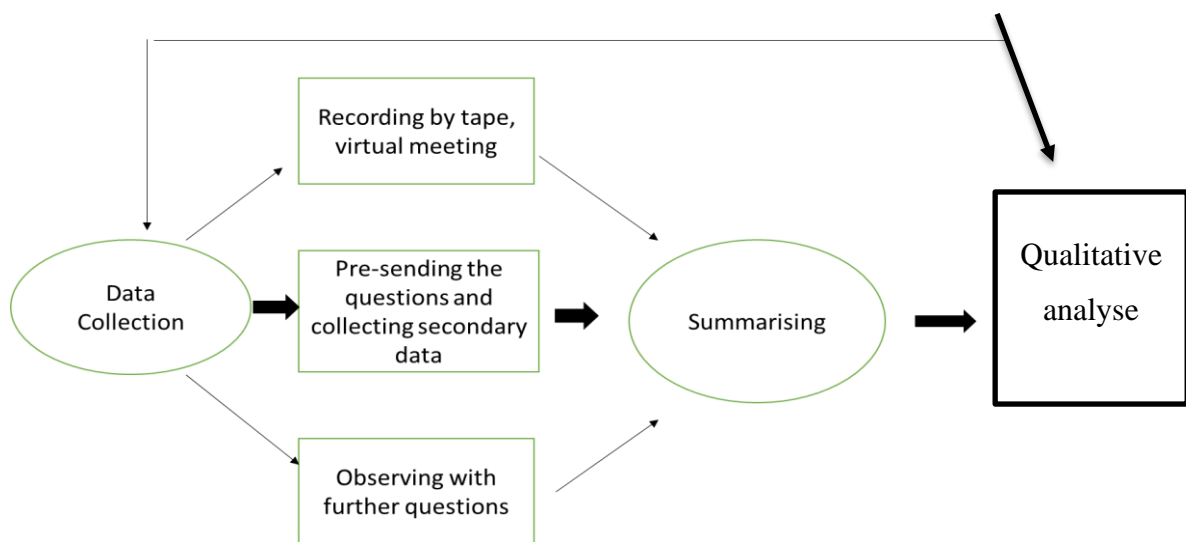
The Gioia method, have been priorly used to bring "qualitative rigors which are occurring in inductive research." (Mäntymäki, M Hyrynsalmi, S & Koskenvoima, M. 2019, p.3) One similar and more sales orientated study, was done by Matti Mäntymäki<sup>1</sup> & Sami Hyrynsalmi<sup>2</sup> & Antti Koskenvoima In a study *How Do Small and Medium-Sized Game Companies Use Analytics? An Attention-Based View of Game Analytics data-collection*. This study was published in Information Systems Frontiers; New York (Apr 2019)

According to Bryman & Bell “frequently cited approach to the analysis of qualitative data especially stress the importance of allowing theoretical ideas to emerge out of one’s data.”(Bryman & Bell 2011,p.393) In the specific research conducted by Mäntymäki, Hyrnsalmi & Koskenvoima, the authors used a deep interview analysis from 10 experts from the gaming industry. The duration of the interviews was” 50 min to 80 min”.” (Mäntymäki,.M Hyrnsalmi.S & Koskenvoima.M.2019,p.3)The researchers mentioned it is important to keep a relevance between the analytical process and data collection. “During these phases, we iterated and refined inferences of theoretical mechanisms from the empirical material” (Mäntymäki,.M Hyrnsalmi.S & Koskenvoima.M.2019, p3)

As the authors described their steps in the process, the first stage of the analysis process included reading the interview transcripts and marking codes to describe the content of the interviews. After this process, the authors moved to” the second stage of the analysis process, we further categorized the first-order codes into more abstract concepts, while writing numerous brief notes.” (Mäntymäki,.M Hyrnsalmi.S & Koskenvoima.M 2019, p.3) After this step of the process, they moved to the third stage of the analysis process. “In this stage, the analysis and specifically looked at how attention manifests itself in the categories identified in the previous stage.” (Mäntymäki,.M.Hyrnsalmi.S& Koskenvoima.M..2019, p.3)

The authors “ took several measures to ensure the rigor of the research process and the trustworthiness of our interpretations..”(Mäntymäki,.M.Hyrnsalmi.S& Koskenvoima.M 2019, p.4) The authors used “Lincoln and Guba 1985 to create measures as Dimension of trustworthiness, description, measures taken.”(Mäntymäki,.MHyrnsalmi.S& Koskenvoima.M 2019, p.6) The same method was implemented for this research. In the appendix is a visualization about their methods to analyse their findings of the study. The authors used “four themes describe the role of game analytics,” (Mäntymäki,.M Hyrnsalmi.S & Koskenvoima.M, 2019, p.5) The authors findings after the analysis was suggesting to”analytics and metrics do not make the games, but they can be very useful and valuable in making games better” (Mäntymäki,.M Hyrnsalmi.S & Koskenvoima.M, 2019, p. 6)

The validity and the transparency of the research done, by using a similar method as Mäntymäki, Hyrynsalmi and Koskenvoima, described in the Appendix 2. Similar as the Mäntymäki, Hyrynsalmi, Koskenvoima model, the Gioia model was employed for breaking down schemes in the s research. To visualize the Qualitative data analyzing process, the model by Christensen L, Enghdal, N, Grääs. C & Haglund L, was used to clear the structure of the process. By first sending the questions in advance and communicate with Respondents. Then collecting and observing the Respondents in the interview.



*Figure 4. The method & process used in the study. The Qualitative research process. Christensen L, Enghdal, N, Grääs. C & Haglund L page 298, year 2010.*

### 3.3 Data collection

Collecting and finding the right number of participants and respondents was quite challenging. This topic was found as highly important, “there is a lot happening in within this area and we are considering collaboration projects in the Nordics.” (Adviser from the organization Finland Ministry of Finance, 31.07.2020) Since the concept of using Open Data was based on more transparency within reporting, the approach to study how growing companies, can use data for improving the financial reporting?



Is a highly relevant area and a target group to interview. The data collection process was done by semi-structured interviews. Bryman & Bell describes the semi-structured interview as “The researcher has a list of questions on fairly specific topics to be covered, often referred to as an interview guide.” (Bryman & Bell 2011, p.467) The respondents had all a common factor and interest to learn about data process management and how it could support their finance. So in the process, I would as well keep a lecture about the topic for all the respondents. The desired outcome was that it would as well provide the companies with knowledge about the topic. This would as well hopefully give the companies knowledge of how to gather data more efficiently for their investors, that also are Stakeholders for the selected companies.

The research questions are the following. The first is to describe a data management process and how are the companies currently working with it? Does a good data management process improve the companies process and reporting for its stakeholders? Does a good data management process improve the companies processes? The questions were based on three different categories, based on three main questions. In these three categories were sub-question, with the aim to get more variation on questions.

The first question groups purpose was to collect information on the companies and the segments metrics. This was done to understand and define the companies specific metrics. To receive an understanding of what the company-specific measures are and how much time is spent on the process? The second question group was to understand the Data Management Process within companies. This question group focus to understand how the companies understand the data management and storing data, this was considering the companies internal processes. The third question group was based on external information and delivering information for shareholders. The structure of the question for the interview was done in this group. The collection and documentation were done virtually. The interviews were recorded and transcribed. The duration for all the interviews was 40 minutes. The process was first to record interviews, then transcribing the interviews and observing pauses, as well as the tone of voice. The method for organizing the interviews was done, by first sending out the questions to the respondents, with a week of notice to

prepare for the interview. The interview was done, by using an interview guide to be able to follow the structure according to the question categories.

### **3.3.1 Selecting the participants**

The selection of the participants for the interviewee was done by choosing subject experts in their own industry. To be able to understand and to receive a broad diversity of the companies, as well as to receive multiple opinions of the topic. Most of the contacted persons, considered the topic to be interesting and considered it to be a timely topic. One criterion, in selecting the participants was the level of expertise of the subject within the growth company sector. Due to the qualitative nature of the research, the selection was done by subject experts and companies with a need to report for their owners. Compared with the prior research done by Abe Masato regarding SME companies in Asia and the Pacific Masato Abe the limitation of the studied companies was based of “1) number of employees; (2) turnover of business; and (3) capital investments.”( Masato.A.2012, p.3)

By interviewing industry specialists, it could be more relevant to define the companies by the right amount of transaction and not categorize the participants, according to employees, turnover and capital investment. S.Coleman defined the “ maturity level” (Coleman.S. et al. 2016 ,p.10) ‘The maturity level is defined in chapter 2.2, referring to companies that are in a certain stage in their data process. Due to startt-up companies may not have the same amount of transactional data and amount of data. This was also determined by the amount of data and which data used. At the beginning of the research, it appeared that the right criteria is in the transaction of data. While interviewing companies whit, not enough transactions, there could not be a visible data management process. The participants were therefore chosen by a knowledge of the industry or a relevant position in the company.

### **3.4 Validity and Reliability of the research**

Bryman & Bell considers there to be 4 criteria that define the trustworthiness of qualitative research. “ Trustworthiness is made up of four criteria, credibility, transferability, dependability, confirmability”(Bryman & Bell 2011, p.395) The credibility, that according to Bryman & Bell is one of the criteria’s for trustworthiness Is in the research done by respondent validation, “ a process whereby a researcher provides the people on whom he or she has done a research with an account of his or her findings” (Bryman & Bell 2011, p .396) This was done by choosing the respondents and having a call with them before the interview and handing the questions out before the interview. By this method, it could be assured, that the respondents were aware of the aim of the study. The Transferability “of individuals sharing certain characteristics” (Bryman & Bell 2011,p.398) the combining characteristic for the chosen participants, was deep knowledge and experience of the topic.

The dependability for the research was to study and document the answers, by different methods. As “this would include assessing the degree to which theoretical inferences can be justified”. (Bryman & Bell 2011, p.398) Recording and writing in the interview, as observing certain reactions of the participants. The recordings were done by a tape recorder virtually. This gave the participants more room to open and discuss their opinions. The “Confirmability is concerned with ensuring that recognizing that complete Respondentivity” (Bryman & Bell 2011, p.398) This was done by choosing participants from different kinds of industries and organizations.

The last criteria are authenticity, this is divided into 4 sub-criteria, “ fairness, ontological, educative, catalytical, tactical “( Bryman & Bell 2011,p. 398-399) Fairness, was achieved by having a different kind of perspectives and industry representatives from organizations, with a deep and centralized understanding about the topic. This was done ontologically by making sure in the interviews, that the respondent had understood the question right and ensuring the perspective. Educative authenticity was achieved by giving the participants more knowledge about the definitions used, in the interview. Tactical authenticity was done by being interactive and challenging the opinion of the

participants, asking confidential questions and for further information. This is verified by confidentiality and anonymity, which reflected on a more open discussion and the opportunity for the respondents to share their thoughts.

## **4. RESULT**

This chapter presents the result of the interview and presents the relation of the answers, related to the research question. In the research, the result is presented in the same order as the question groups. The question groups are defined as the research questions. The first group will be relating to the topic metrics, then describing, what data companies use in their data management process. This will aim to answer the question of how companies consider the data management process and how are the companies currently working with the process? For this purpose, it is important to understand, what data companies handle and how? The second question group is related to how the companies work with the data management process. If the companies have a certain data management process and how it impacts their business process. This question group will aim to answer the research question. Does a good data management process improve the companies process? For this reason, it is important to understand, what challenges the companies have in their data management process. The third question group is defined as the stakeholder and reporting perspective. How do the participants work with external reporting from the data management process perspective? The respondents are in a numerical order, where each respondents' perspectives are summarised and only the relevant perspectives are mentioned. This question group will aim to answer, the research question regarding stakeholders reporting. All respondents have over 8 systems in their Data Management process. Every interview participant has some relation to fast-growing companies and deep insight into the specific target group.

### **4.1 Introducing the Respondents**

All the Respondents work for an organization that either provides services to fast-growing companies, finance the fast-growing companies or work in a fast-growing company.

Respondent 1 male works as a CEO in a start-up company, with a background from the Academic. The company produces medicine and has only one employee, it has been active since 2016. The company is a start-up and has currently received funding. The company struggles with sensitive data, regarding clinical trials for their products. The board of directors consists of 4 persons.

Respondent 2 male, works in instant supporting companies in the expanding process within the Nordics. Respondent 2 has plus 10 years in the industry and Respondent 2 employer, has 30 companies in their network. Respondent 2 considers the most radical change during the last year, has been regarding the savings in the public finance, that have forced them to find new sources for finance.

Respondent 3 female, works as a Controller for an insurance company. Has 3 years experience in the industry. Works mostly with start-up companies.

Respondent 4 male, works as CFO in an international gaming company. Has 6 years experience in the company. The company was recently acquired by a venture capitalist, where the holding company is in the United States.

Respondent 5 Male was referred from another person working in the finance sectors. Respondent 5 is considered an industry specialist. Respondent 5 has 20 years of experience of working with growth companies. Current title: Works on the public sector financed by the Government. The current title, working as a Director in the field of Growth companies

Respondent 6: Male, Has a background within research, now works as the head of SME growth companies, the organization is a union that reports to the government. Respondent 6 has 13 years of experience working within the current organization.

Respondent 7; Female, works as a development director and has worked in the current position for 3 years, but worked in the organization for 6 years. Repondant 7 defines their

organization to be a growing company and they provide services for other growing companies. Respondent 7 considers that the growth companies are divided mostly into the information and service industry. The second largest industry is in manufacturing third largest, is within the retail industry. Respondent 7 employer has 660 growing companies in their network.

*"Meillä on siis 15% teollisuuden puolelta yrityksiä 13% sitten tukku vähittäiskauppaa ja loput palveluyrityksiä. (We have 15 % of our members belongs to the manufacturing industry, 13% retail and the largest group is within the information and service industry.)"*(Authors own translation respondent.7)

Respondent 8 Male, works as a director for finance in a public entity, providing finance for SME businesses. 11 years experience in the organization.

#### **4.2.1 Metrics in Data Management process**

To explain, how companies consider the data management process, it is required to define the process in a company's data management process and to explain what kind of data the companies use. Most of the respondents considered the number of transactions, to define the size of the companies. According to the respondents, the difference between a start-up and a micro company is the number of transactions. For this reason, it is important to explain the transaction cost and what metrics are used? All the respondents considered financial data to be easy to measure, but the more challenging metrics for most of the respondents is in measuring the customer-focused data. This data can be categorized into data including personal information, that can be associated with a person. Respondent 7 considers there are many existing solutions to collect and analyse data for the financial industry, but for other purposes there are not as many available. It is also difficult to handle this kind of data. All the respondents consider the knowledge of the data management process varies a lot between the growing companies. Variables that impact this is related to the industry, culture, and competence.

*kasvuyritysten tilanne suomessa onse, että niinku kasvuyritys rahoitus on suomessa kohtuullisen hyvällä tasolla julkisella puolella.*” The situation of growth companies in Finland is that, like a growth company, financing in Finland is at a reasonably good level on the public side. (Authors own translation Respondent 8)

Respondent 1 considers their company to be in an early stage and they have just received their first funding for internationalization. They have not yet collected so much data, but they use milestones as one metric for their business. Respondent 5 is an industry specialist and he described starting companies to usually operate according to project-based planning. The challenges are in defining the right KPI that is related to predictiveness for the future and that can be defined as financial success factors. Respondent 1 considers the company-related metrics as ” *Voisi sanoa että meidän mittarit ovat aina aika taulussa pysyminen ja budjetissa pysyminen.* (I could say our measure are staying in the frame of our timetable and budget. “(Authors own translation respondent.1)

Since respondent 1 still works with product development he considers their goals are also defined according to their product development.”*Mennään tuota noin tiettyjen tavoitteiden mukaisesti meidän milestone on käytännössä Tuote kehitys Mile stone*” ( We execute according to our specific goals and that are set by our milestones, that which are product development milestones” (Authors own translation respondent 1) Respondent 1 main goal is to sell the company in a certain stage and says this is also an important part in defining their metrics for the company’s future. *Tämä on täysin tämmöistä tutkimus vetoista toimintaa jos ei tule olemaan Minkään laisia tulovirtoja että täysin tarkoitettu myyntiin isoomalle firmalle* ( This is entirely a reseach focused business, we are not expecting any kind of cash flowes and our goal is to sell the company to a bigger medical company.”( Authors own translation Respondent 1) For this purpose respondent 1 considers keeping in their timetable to be an important metric for their business productivity. Even if respondent 1 company does not use financial metrics as their primary KPI, they consider the timetable as a crucial metric for their operational success.

*”Tavoiteena on Exit faasi kakkosvaiheen jälkeen, toki me tutkitaan tässä vaihtoehtoja, että onko järkevää lähteä kehittämään muita lääkkeitä pipelineen. Että akateemisesti sitä pystyy tekemään, mutta onko se taloudellisesti järkevää firmana.* ( The goal is Exit after the phase 2, but we also continuously evaluate other options and if it is makes sense to start to develop other medicines.

Academically we can, but is it economically reasonable?)“( Authors own translation Respondent 1)

Respondent 2 describes their most difficult measure to be in collecting data from their domain webpages. The challenge respondent 2 has, is to be able to analyse on which categories their visitor has been browsing on. Respondent 2 employer organizes events for their members and network. Respondent 2 says it is easier to follow economical figures, but the obstacle is to collect feedback from their seminars. One of the main issues for respondent 2 employer has been in finding new finance. Due to previous years, the organization received most of its finance from the government. It has been difficult to adapt in finding new sources and to use the correct data for it.

Similar to respondent 2, respondent 3 also considers from the companies perspective the most difficult metric to be the customer-related data and to measure the impact for certain marketing campaigns. Respondent 3 employer is currently working on a project, where the aim is to measure radio companies for their advertisement. This is done by narrowing down radio signal frequency to measure, in which specific areas the commercial was reached to and active. The challenge was in receiving enough valid data and to measure it. Respondent 3 employer is still improving the process and so far, the company has only managed to get enough whit data for one month. The problem was in receiving the right amount whit data, to be able to measure the impact. Respondent 3 invests a lot of capital in collecting and analyzing the data, respondent 3 follows their customer user data on a 5 minutes timescale.

*Nähdään sitten miten asiakkaat reagoi siihen ominaisuuteen nähdään lähes reaaliajassa.* Then we can measure how the customers react into that feature and we can measure it in near real-time ( Authors own translation Respondent 3)

Respondent 3 employer uses this data for their product development. Relating to starting companies and internationally expanding companies, Respondent 4 uses a comparison model to benchmark a price value. Respondent 4 considers it would be effective if there would be more data available for international comparison. To compare the local companies with international companies, to be able to determine a value.



*”Yhtiö jolle löytyy niinku helposti samantyyppisiä toimijoita ympäri maailmaa, niin silloin se on kohtuullisen ykinkertaista määritellä toimiala. A company for which you can easily find the same type of players around the world, then that's it, it's just as simple to define the industry.”* ( Authors own translation Respondent.4) Respondent 5, considers the metrics and the metrics between growing companies to vary a lot. When a company applies for finance from respondent 5 employer, respondent 5 employer provides them with an Excel template and provides the company with instructions to fill in the Excel sheet. Respondent 5 mentioned the following accounting metrics. Respondent 5 for the employer can follow financial data, due to the reason respondent 5 supervisor provides this excel once a month. This Excel includes a cash flow forecast, with either a project estimate or a business estimate. Respondent 5 says they have the most difficulties in measuring their customers “ *projektiseuranta* project base” measures, (Authors own translation Respondent.5)the biggest difficulty they have, is to get all persons to document the related data.

This gives respondent 5 challenges in collecting the data from their customers projects. This information will be provided to Respondent 5 supervisors formed Committee for corporate Analysis respondent 5 considers the “ *toimiala spesifi* industry specific” ( Authors own translation respondent 5) data is difficult to measure. These companies usually lack any proper way to document this transaction. The challenge within this project is “*pilootit* ( project pilots)” that can have different kinds of metrics, which is difficult to generalize. The smaller size of the companies is and the fewer employees the companies have. It is problematic to follow and to collect data. According to Respondent 5 “ *nämä ovat yleensä projektikohtaisia*” ( This are usually project based. project-based” companies” (authors own translation respondent 5). Were the main challenge will be in the documentation. Respondent 5 considers “*kokemus*”( experience) (Authors own translation respondent.5)

The challenges this will reflect on, is respondent 5 possibility to finance the company, without documentation. Respondent 5 mentions, most companies are more aware of storing data, than before. But collecting the data still seems to be challenging for the companies. Respondent 6 employer primary measure is the financial data, but secondary comes to the customer-related data. Where they follow and measure their members

opinions. Respondent 6 mentioned it would provide their members with efficiency, if there could be a database where their members could have a database, of international keywords and some form of solution to spot trends, based on keyword companies are searching with. This would be useful in spotting international trends and collecting that data into one source.

*“Meillä olisi käsitys siitä, että OK että tämän tyyppisiä yrityksiä nyt on tuosta markkinasta kiinnostuneita ja silloin on olisi ehkä helpompi kohdentaa myös tiettyjä palveluja. We would have the impression that it is OK that these types of companies are now interested in us and they are located in that market and then as it would perhaps be easier to target certain services as well. (Authors own translation Respondent 6)*

Respondent 6 has structured and categorizes the fast-growing companies into 3 different kinds of categories, they have managed to identify. Respondent 6 can also recognize there to be a big difference between the knowledge of the data management process, between these categories. The first category is the traditional companies, that has achieved their full market potential in the domestic market and now seeks new markets. The second category is the born global companies and these companies usually have a culture in data management and are competent in the field. These companies strive to expand immediately when they start their company. The third category consists of more traditional businesses that do export.

*”Sitten taas se toinen ryhmä on on niitä yrityksiä jotka on pitkään siis kotimarkkinoilla kypsyneitä täällä sitten mahdollisesti niinku ne kasvun rajat nyt sitten saavuttaneita ja sen takia tähtäävät nyt sitten sinne niinku kansainvälisen kasvun ja lähtevät niinku ulkomaille. Tässä on paljon myös niinku kaupan ja palvelualan yritys. Then again, the other group is those companies that have matured in the domestic market for a long time here, then possibly as if they had reached the limits of growth now, and because of that they are now aiming for international growth and going abroad. There is also a lot here like a trade and service company ( Authors own translation Respondent 6)*

Respondent 6 mentions that the lack of knowledge within data management is one of the biggest challenges for the company scaling abroad. Respondent 7 considers the most challenging metric to be the impact of different kinds of marketing campaigns. Respondent 7 also considers it is challenging to collect the data from different kinds of systems. Respondent 7 considers it would be more efficient if the data would be centralized to one source.

*” Taloushallinto on selkeä, niin siinä ei välttämättä ole haasteita. Asiakapalautteen kerääminen on haastavampi, koska se on kerätty useammasta eri ohjelmista ja tapahtumista. Yhtenäisen palautteen kerääminen on enemmän työläämpää. Yksi mitä seuraamme on vaikuttavuus ja miten viestintä toimenpiteet vaikuttavat.. ( financial data is easy to measure and there are not necessary any challenges. The customer satisfaction data, is more challenging. Because it is collected from many different programs and events. One thing we follow is our impact and what effect our communication has..( Author own translation Respondent 7)*

The respondents consider it is difficult to measure online activity among their digital channels. The respondents are uncertain about data governance legislation, the respondents did not have an internal data governance policy and felt this could be potentially beneficial to implement within their organization.

*”Parempi, osaamista.tietoturva. kulttuuria ei varmaan ole. Eikä annettu ohjeistusta miten tietoturva käsitellään ja jatkuvasti. on parannettava. yleistä osaamiseta. ( Better knowledge in handling data and a culture regarding information security, assumption that most companies does that give clear instructions for their employees and there is continuously knowledge to improve in general competence.( authors own translation Respondant 5)*

Respondent 7 considers this to be more related to industries and mentioned that there could be visible a certain industry-related awareness about the data management process, after the development of e-commerce that has provided more awareness among the commercial industry. *“Kyvykyys, ja toimiala ( Knowledge and industry)”* ( Author own translation respondent 7)

*Se vaihtelee ihan hirveästi koko kyvykyys niinku tää digi kyvykyys vaihtelee ihan todella paljon että on niinku on on niinku kaikenlaista toiset toiset on niinku vieläkin niin on on ongelmissa suurin piirteiniinku ihan nettisivuja sähköpostien kanssa että se kertoo niinku jotain siitä että mikä on sitten ymmärrys jostain pilvipalveluista niin no eihän sellaista ole. It varies a lot, what the terribly whole ability like this digital ability varies quite a lot that is like that is like that kind of others is like that still so is there are problems with most features like web pages with emails that it says something like that what is then an understanding of some cloud services so well be. “ (authors own translation Respondent 8)*

The respondents consider there to be a challenge in collecting data, where includes their customers personal information. The respondents considered they do not have a clear understanding of how to handle this data. This is due to the sensitivity of the data and the regulations.

*Tämä kaikki muu on tämmöistä mitä on haastavampi saada yhteen. Mutta talouden luvut on kuitenkin siis semmoisia jotka on niinku on se silleen aika suoraviivaisia.. Mutta tuota niinku nää kaikki muut datat kun mennään henkilöstön hyvinvointi asiakastyytyväisyyteen jonkun oman palvelu tai tuotannon niinku suorituskykyyn tai suunnitelmien toteutumiseen niin niihin on aina erikseen rakennettava ratkaisu. Everything else, is what makes it more challenging to get together and collect.. But the economic figures are very straightforward. But when it comes for other data, as comes staff well-being, customer satisfaction, someone's own service or production, such as performance or the realization of plans, there have to be a customized solution built and there is nothing ready to implement, it must always be built separately.” ( Author own translation Respondent 7)*

Respondent 8 describes fast-growing companies having a need for expanding internationally and it to be important for their business. Respondent 8 foundation will only provide finance for companies for recruiting more personal, he also considers the growth companies challenges are mostly in finding the right kind of financiers. The second variable which respondent 8 use, is the age of the company. If the company has been founded over 3 years, it is perceived as a growth company. Respondent 8 considers as well the culture and knowledge to be the challenges within the data process management among fast-growing companies. Respondent 8 mentions, that even if the leap to a digital era has been happening rapidly, the will to implement these solutions is still slow among the fast-growing companies. Respondent 8 still considers most fast-growing companies have a will to implement more customer-related Data management solutions.

Respondent 8 does not have any standardized requirements from where it would be ipossible to collect financial data, from their target companies. Respondent 8 employer collect the data from the public records as tax and credit data. Respondent 8 will also ask the companies to fill a form and give detail regarding their finance. Respondent 8 determines the metrics to be either related to investments or recruitments, for the applying company. The respondents consider customer-related data to be more difficult to collect, than financial data. According to the interviews, all respondents consider the data management process to be a part of all business areas and the respondents consider it to be an important part of their business. The data that most participants would hope to be more accessible is international data, to have a use case to compare with.

#### 4.2.2 How the companies work with the data management process.

To be able to explain how the companies work with the data management process. It is important to describe, what is important for the companies in a data management process. Most of the interview companies, considers fast-growing companies do not use any tools for analyzing the data or to share the data. The possibility to share data is important, in the respondents data management process. There is a common concern in handling sensitive data. All the respondents consider the companies need to apply analyzing and sharing their data, into their data management process. Due to this would save the companies time and therefore resources, as well as work hours. There is a common challenge in collecting the data, according to the respondents this is related to the culture of data collecting. The second challenge is the legal perspective of handling data.

Most of the respondents currently provide their external stakeholders a dashboard, that they use for external reporting. The common challenge most respondents provided was the sensitive nature of the data and by handling the data. The respondents thought there was a legal risk in providing as well as storing the data. The respondents consider this risk to be higher than the cost of implementing this. All of the respondents use Excel as a tool for handling the data management process. All respondents consider the data management process to be an important part of their business. Respondent 1 considers the most interesting source of the data would be in and developing a price for their product.

*Pitkälti tähän firmaan arvon kehitykseen ja tuota lisenziin liittyen me tullaan käyttämään ulkopuolisia ja hankkimaan kansainvälisiä asiantuntijoita ( It will be related to the companies valuation and for the licenses we will use external experts from International markets. )” ( Authors own translation Respondent 1)*

Respondent 2 works with accounting software and marketing software. Respondent 2 would want to use data for analyzing and receiving a better insight into what their customers want. Respondent 2 would want to receive detailed data about their website visits but says this is difficult to collect on a detailed level. By being able to get this insight, Respondent 2 considers they could customize and target their potential customers

better. Respondent 3 uses and collects data on daily basis for their business. Respondent 3 employer makes agile decisions based on data and uses it for developing, as well as customizing their solution for their customer's needs. Respondent 4 considers, there to be a good potential in collecting data for their customers, where they would be able to compare different segments and give their customers insight. Respondent 5 considers, the biggest change during the time-period "*pilvi tiedon vieminen. juriidinen haaste, kannattaa, volyyimia*" ( Authors own translation respondent 5)The transformation to cloud, the legal perspective and the amount of data. Respondent 5 considers there are several risks in reporting and if the data is not documented. Due to external stakeholder requirements and if the data is not provided in time

Respondent 5 uses the data for reporting to the government to be able to receive funding for their department. Respondent 5 supervisor reports to the government for finance and one of the important metrics for respondent 5 supervisor is supporting the national export. Respondent 5 supervisor provides every month a dashboard with information 6 months a report to the government for finance and they have 20-30 metrics. According to Respondent 5, they have centralized all data collection to one department and it can take several days, to collect this data for the financiers. Respondent 5 mentioned, that his organization has had several discussions about developing their database, but the challenge in this has been "*henkilötietojen säilyttäminen storing personal information*" (Authors own translation respondent 5)Respondent 5 considers "*juriidiset asiat. The legal perspective*"( Authors own translation respondent.5) to be most difficult.

Currently respondent 5 employer use 10 different software's, where they are collecting and measuring data on a daily frequency. Respondent 5 company measures their customers, monthly where they collect the data on an excel spreadsheet. For their stakeholders, they use a dash-board, where their stakeholders have common access to the data. This makes it the possibility for their stakeholders to immediately access the data, from a shared location. Respondent 5 considers most companies use external cloud services, to manage their data. Respondent 5 considers these solutions to be a relevantly proper option for starting companies.

*“ Nykysin on olemassa niin paljon ketterästi käyttöönotettavia pilvipalveluja, että ne on melko helppoja ottaa käyttöön ”Me käytämme omaa palvelinta, koska käsittelemme niin arkaluontaista dataa, tämä myös vaikeuttaa tietojen jakamista. Nowadays their are so agile cloud services, that are easy to implement. We use our own cloud service, to storage the data. “( Authors own translation respondent 5)*

The challenge is in sharing this data, respondent 5 considers the same, and the companies have a certain feeling of responsibility in handling their customer’s data”

*“ Se, että kun sen tiedon lähteet on siis meidän jäsenyrityksiä ja meillä on niin kun me ollaan oltu hyvin ehdottomia siis siinä tapauksessa mikä me annetaan meidän jäsenyrityksille, että että niitä tietoja käsittelee vaan ” The fact that when the sources of that information is cost of our member companies and we have so when we have been very absolute therefore in the event that we are given to our member companies that that information is processed “ ( Authors own translation Respondent 6)*

The participants consider there to be many technological solutions to store the data and data governance is a concern most companies have related to sensitive data. The companies are uncertain of how to handle the data in a compliant way.

*”Uusimpoie sovellusten ja tavallaan juuri kaiken datan yhdistämisen, näkökulmasta miten voisi käyttää ulkopuolelta dataa hyödyksi ja miten voisi tunnistaa sen hyödyn. With the new latest apps and methods of combining all this data, from a perspective of using the data external and to identify the need.( Authors own translation respondent. 7)*

*Haastavampi kokonais tai sitä dataa on paljon, mutta se pitää aina kerätä niinku monesta eri paikasta. There is a lot more challenging overall or that much data, but it should always be collected from so many different places” ( Authors own translation Respondent 7)*

The Respondents considers it to be important to have a location, where there is an ability to share data and to transfer it for other parties involved.

*”Järjestelmistä tulevaa dataa on paljon, niin kai se kaikista helpoin tai siihen helpotus siinä olisi sellainen, datahub. There is a lot of data coming from the systems, so I guess it would be the easiest and a relief if there would be a datahub where the data would come from.”(Authors own translation respondent.7)*

*Kyllä sitä kokoajan datan näkökulmasta on mietinnäessä miten sitä käsitellään ja missä. From a data perspective, we continuously consider where the data comes from and where we are handling it? (Authors own translation respondent.7)*

*Miten sen pystyisi rakentamaan semmoisen data arktehtuurin etää se keräisi tehokkaimaista data eri järjestelmistä kun yksi... From a data perspective, we continuously consider where the data comes from and where we are handling it? How we could build a data architecture, so it would be efficient to collect all the data to one place” (Authors own translation Respondent 7)*

Respondent 8 considers the business use for data, would from their perspective be the most useful to identify frauds and that it is one of the most difficult data to locate. Respondent 8 considers that data could support their organizations in risk management and to prevent risks. All the respondents consider culture and industry, to have an impact on the fast-growing companies processes to work with the data management process. All the respondents had several departments and persons working with data. The Respondents all work with collecting data, but only a few of the respondents have proper tools to analyze the data or share the data. Between all participants, there is an industry-related perspective and need of collecting data. The findings show culture also relates to the business industry and the competence of working with the data management process.

#### **4.2.3 Data for stakeholders**

This question group's purpose is to answer the research question if a good data management process improves the company process and reporting for their stakeholders? To be able to answer the question, it is necessary to describe the challenges in providing 'data for the stakeholders. Among all respondents, the common factor was external reporting, and the respondents consider, the third parties reporting to be important. If the data was not provided in a certain time and if this data is not collected. It will impact the companies finance and the finance can be declined. The Respondents consider it is a time assuming process to provide value for the stakeholders. It is an important process for the companies if it is not done by following the stakeholder's requirements. It can lead to



negative decisions for their funding and it can be declined. All the respondents consumed many work hours and resources to collect, as well as report for their stakeholders.

The following list is collected from one of the anonymous crowd-funding investors. The crowd-funding investor has the following list of requirements. From a Data Management process, most companies consider the financial data to be simpler to collect and measure. The financial data and customer data are specified in the following illustration. The customer-related was considered more as more personal and sensitive data, this was perceived as challenging. Due to the method of handling personal data, that was considered sensitive. This was also more difficult for companies to collect.

”· *Liikevaihto* (Revenue)  
*o Kasvuprosentti edellisvuoteen verrattuna* Growth percent compared with last year.  
*o Jatkuvan liikevaihdon osuus* Recurring revenue proportion  
 · *Tulos* Profit  
 · *Taseen loppusumma* Balance total sum  
 · *Omavaraisuusaste* Own equity  
 · *Henkilöstön määrä* Personal amount  
*o Muutos edellisvuoteen verrattuna* Difference in relation to last year.  
 · *Uusin osakkeen hinta, jos tullut uusia sijoituksia tmv* Own shares price, if new shares.  
 · *Tehdyt sopimukset / kaupat, jotka eivät vielä näy liikevaihtona* Done agreement/ deals, that are not visible in equity  
 · *Myyntipipeline* Sales pipeline  
 · *Uutiset ja saavutukset, jotka tulee uutiskirjeissä* News and accomplishment.  
 · *Yhtiössä olevien osakkeiden määrä (myös fully diluted)* The companies shares.”  
 (Anonymys crowd funding companies list of requirement.)

*Financial*  
 ”· *Liikevaihto* (Revenue)  
*o Kasvuprosentti edellisvuoteen verrattuna* Growth percent compared with last year.  
*o Jatkuvan liikevaihdon osuus* Recurring revenue proportion  
 · *Tulos* Profit  
 · *Taseen loppusumma* Balance total sum  
 · *Omavaraisuusaste* Own equity  
 · *Henkilöstön määrä* Personal amount  
*o Muutos edellisvuoteen verrattuna* Difference in relation to last year.  
 · *Uusin osakkeen hinta, jos tullut uusia sijoituksia tmv* Own shares price, if new shares.  
 Customer related  
 · *Tehdyt sopimukset / kaupat, jotka eivät vielä näy liikevaihtona* Done agreement/ deals, that are not visible in equity  
 · *Myyntipipeline* Sales pipeline  
 · *Uutiset ja saavutukset, jotka tulee uutiskirjeissä* News and accomplishment.  
 · *Yhtiössä olevien osakkeiden määrä (myös fully diluted)* The companies shares.”  
 (Anonymys crowd funding companies list of requirement.)

Figure 5. The different reporting measures. Anonymys crowdfunding companies list of requirements.

Respondent 2 considered their external reporting to be time assuming for their stakeholders, it requires that they collect and report including figures of how they have

accomplished to support the industry-related economy. Respondent 2 supervisor receives both domestic and international requirements for their funding.

*”Det är näringsministeriet som som beviljar den här finansieringen och det här då gör vi. Det är så här mellan rapporter här under året så där 2 gånger under året och sen är det slut rapport efter årsskiftet. Ministerier bil ha och hur ser ni på den här ska vi säga att jag tar insamlingen inom det där inom för att samla rapport kontext. .Nu lägger jag ner en vecka åtminstone på den där och sen vecka komma med räkna på det här slutrapporten It is the Ministry of Trade and Industry that grants this funding and this is what we do. It is like this between reports here during the year so there twice during the year and then there is the final report after the turn of the year. Ministries car ha and how do you look at this we should say that I take the collection within that within to gather report context. .Now I spend a week at least on that and last week come count on this final report “( Authors own translation Respondent 2)*

Respondent 3 considers there have been large changes after his employer sold the company to an American owner, that is a larger organization and has other legal requirements.

*“Sitten kun taas on on isompana osana firmaan niin tämmöset niinku kannattavuus mittarit alk aa vaikuttaa toimintaa. Toki se on aina se myynti mikä määrää jos rahaa ei tule mistään, Then when being a part of another big group, then things like profitability metrics start to affect operations. Sure, it’s always that sales is what determines if money doesn’t come from anywhere else. “ ( Authors on translation Respondent 3 )*

This has lead to respondent 3 employer, searching for ways to continuously improve their process.”*Jatkuvasti ja sitä niin kun tuota raportointi prosessia pyritään kehittämään. Nyt on yksi isompi automatisaatio.* It is an ongoing basis and as that reporting process is developed. Now it’s like one on one bigger automation. (Authors own translation Respondent 3) From an international perspective respondent 3, considers there to be differences.*Meillä on tämä jenkkien pakko eli siellä määritellään miten alle 13 vuotiaiden dataa saa kerätä.* We have this American compulsion, which defines how data may be collected for people under the age of 13 (Authors own translation Respondent 3)

Respondent 4 has the most experience with starting companies. She considers that most companies struggle to determine the right kind of metrics, due to the early phase. Companies usually struggle with depreciating the value of their products, that are under development and being processed. Respondent 4 says that the measures between starting companies can variate a lot and are usually really specified for the industry and can not

be generalized. Respondent 4 mentions that most of their clients have challenges in delivering the data in time to them. According to respondent 4, this will also impact their handling process and may impact the decision time for their customers.

*"Niin kuin esimerkiksi tuotteen tai palvelun valmius asteeseen, tai siihen tuota mistä vaiheessa mennään sitä niinku ideasta ikään kuin siihen tuotantoon. Like, for example, the degree of readiness of a product or service, or the stage at which one goes from an idea as if to that production" ( Authors own translation Respondent 3)*

While asking Respondent 5, what data management could deliver for their organization, he replies "*Tehoa ja tuottavuutta*" ( Authors own translation Efficiency and productivity.) Respondent 5.

*"Mikäli yhtiöt eivät säily tai kerää tietoa, niin yleensä vahinko tapahtuu liian myöhään, silloin on jo vahinko tapahtunut ja on liian myöhään, sillä on suora vaikutus rahoitukseen ja se voidaan silloin lykätä"* If the companies does not store or collect data, then it can be to late and the accident already has already happen and it can be to late. This has a straight impact on the finance and it can prevent the companies to receive finance. ( Authors own translation Respondent 5)

Respondent 6 considers it to be challenging to collect and transform the data.

*"Toistaiseksi on hyvin tällaista manuaalista, että se siis se on sitä, että ei, että kun meillä on joku joku tutkittu tieto, niin me siitä viestimme niin kuin suullisesti ja kirjallisesti näitä. So far it is very different from the manual that it is then it is that not when when someone someone researched the information, then me about it we communicate as orally and in writing. ( Authors own translation Respondent 6)*

One of the challenging parts in handling the data is the nature and the consent regarding the data governance. Respondent 6 still considers there is a responsibility in keeping this data protected and he feels it is more important to retain the privacy than to share it.

*"Sillä tavall me saadan vaimistettua myös että luottamus toteutuu ja yritykset avoimesti kertomaan vaikeistakin asiosta. And in the way we get then, as we can also make sure that when this trust is realized, so also when companies openly tell about the situation and even difficult things. Authors own translation. Respondent.6)*

*"Sillä me ollaan ihan niinku minun mielestä edistyksellisiä et tota et nää on huolehdittu nämä tietoturva asiat ja muut aika aika viimeisen päälle kyllä. For we are just as I think*

progressive time over the last yes.”( Authors own translation Respondent 6) The respondents had in common need to provide data for their shareholders on a frequent level and to summarize.

*Että tuota semmoisia yhteenveto jotka, on kumppaneille niin se neljännesvuosittain on aika semmoinen. Toki, me seurataan sitä kyllä aktiivisesti ihan niinku tiettyjä toimenpiteitä. Tottakai niinku tosi välillä niinku tosi aktiivisestikin ihan niinku päivittäin.* That produces such a full summary to all partners, so it's quarterly pretty much like that. Of course, we are actively monitoring it, just like defining measures. Of course, as true at times, as really active as every day (Authors own translation Respondent 7)

Respondent 8 employer uses a database where they can transfer data from and report to their stakeholders. All the employers work with the databases and collect, as well as share data. From these databases, all the steps in the financial process are done. From collecting and sharing information, to paying the finance to the companies. Respondent 8 solutions offer the possibility to deliver the data and provide a quick path for their stakeholders to access the data, which seems to be a functional method to collaborate with data. Respondent 8 mentions his organization is now considering using the data, for automatization and to develop an AI, to support their organization. The database is own and created by the government and has many organizations collaborating and sharing the data.

*”Sijoittajien yhdistäminen näihin ja näille yrittäjille, niin se on varmaan semmoinen niin kuin keskeinen palvelu jolle on tarve* To combine investors to this and for those companies, it is likely to be a centric service like that which has seems to have a demand.” (Authors own translation Respondent 8)

According to the interviews, there can be interrupted a finding that all respondents consider it to be important to share data for their stakeholders. The stakeholders also require frequency in delivering and assembling data for them. In the data management process all the respondents considered there to be financial risks if the respondents did not deliver the valid data in time. The reporting varies on the level of international the company or its owner is.

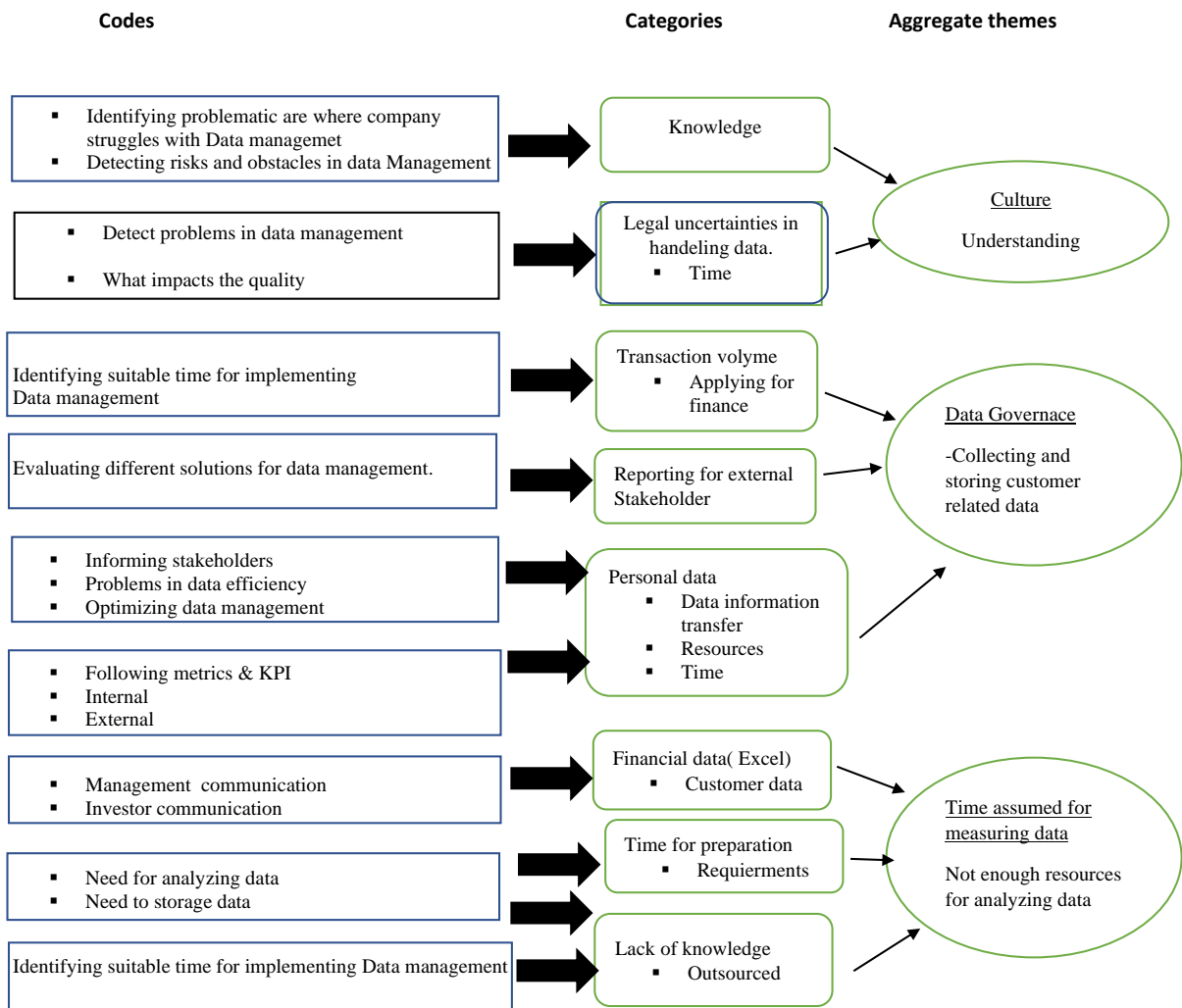


Figure 6. How the scehems were broken down to rigors.Rigors and schemes in the research.

*Tabel 1. Tabel of coding systems and common variables in the research. Visual coding of systems used and measures among respondent*

Object	Amount of systems	Department	amount measurs	easiest to measure	hard to measure	culture	data storage
1	1	1	2	financial	customer	industry	external
2	4	3	2	financial	customer	legal	external
3	5	5	5	financial	customer	industry	external
4	2	3		financial	customer	businees	external
5	10 systems	2	financila easiest	financial	customer	culture	internal server
6	4	1		financial	customer	culture	internal server
7	7 systems	3	3	financial	customer	culture	inexternal
8	8 systems	2	2	financial	customers	culture	internal server

### 4.3. Findings

In the research, one criterion for choosing the proper participates is the number of transactions and data. By these criteria, start-up companies are narrowed down, from the start-ups perspective the respondents consider the company to operate with a project-based process. In comparison to fast-growing companies, these sized companies start to have a wider category of data, that is being generated. According to the interviewed respondents usually, start-ups only have customer-focused data and fast-growing companies have more financial data. Compared to Asma Hassanis description of the Data Management process. Fast-growing companies collect the generated data, into a system.

After the data is collected the companies distribute responsibility, most fast-crowing companies use external providers and outsource the responsibility. When the responsibility has been distributed, the companies use either internal or external resources to analyze the data. Financial data is easier, and customer-related data is perceived as more difficult to analyze. This data will need to be prepared for external stakeholders, external stakeholders can be categorized as financers or owners. If this data is not prepared correctly, it can have an impact on the companies finance, which may lead to negative funding decisions. In the interviews, the respondent considers that sharing data could as well provide the fast-growing companies a better platform to share all data. This

is still a topic that requires more knowledge for the companies and more education within the topic. According to Asma Hassanis Data Management process, companies have a certain method that can be implemented. The Data Management process consists of data “generation, acquisition, storage and analysis” (Asma Hassani 2017,p.744) Comparing this theory to the findings, it can be illustrated that fast-growing companies do operate in a similar process. The figure visualizes how companies work with the data management process.

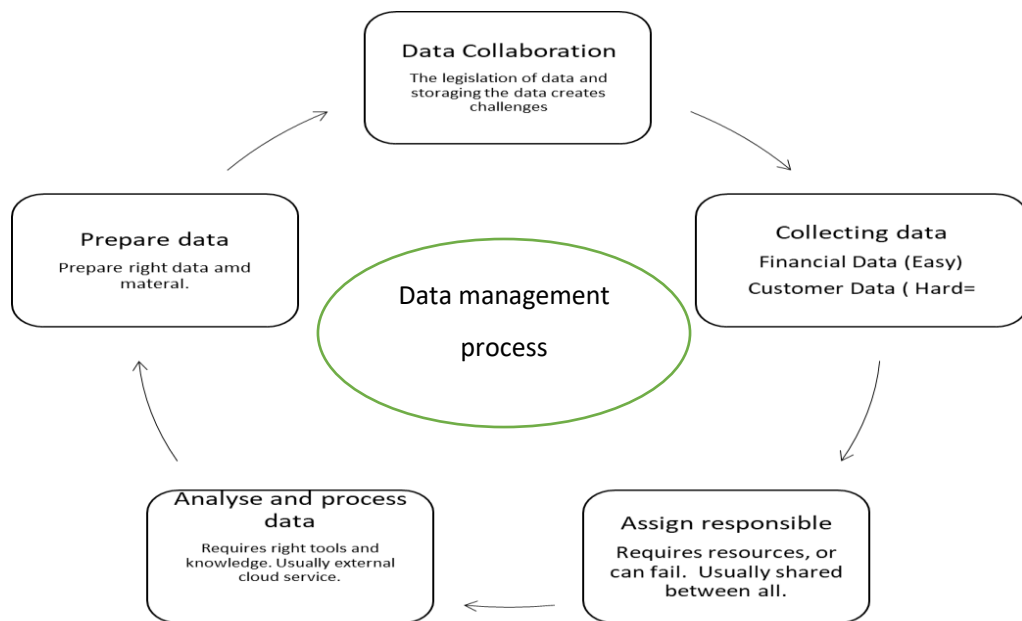


Figure 7. Respondents data management process visualized, compared to theory

## 5. DISCUSSION

Most growing companies lack the proper tool for analysing and collecting data. Most of the growing companies struggle with similar challenges. International data sources can provide information for companies, which are expanding internationally and help them in finding comparisons, or networks. The business use can be in finding and comparing the markets, that can provide insight that will help the companies in the process. The

interviews point to fast-growing companies need for using the data management process to support their operational business. A good data management process improves the fast-growing companies probability to receive funding and it has risks on their financing. Most growing companies do not have proper data solutions to analyze customer-related data. From the research, it has been possible to make findings, regarding what difficulties economic and operational difficulties fast-growing companies now have and how data analytics could support fast-growing companies, to optimize their operations?

One of the most crucial parts within the data management process is collecting the data, this takes many work hours for the employers. According to the research the method that could possibly support this function, would be by transferring data more efficiently. The "maturity level" (Coleman.S. et al.2016 ,p.10) defined by S.Coleman are in a certain stage in their data process, has a significant impact on the companies readiness to implement the data management process. The suggestion is that companies consider this in the timing of adopting a suitable data management process. From an international perspective, there could be more accessibility for international data sources and methods to share data. In the following, the 5 main categories are defined and separated.

*Systems and knowledge.* Most growing companies are not so aware of all the systems and the common within this segment is Excel. Most growing companies don't have enough resources or knowledge to use data management systems.

*Data Governance.* The challenges in it is the legal risk of handling the data and the possible risk to storage the data. The Respondents were considered of the legal aspects of handling this data still, the handled data is important for the external stakeholders, this makes it difficult to share the data more openly. This impacts the methods of collecting the data, which will also impact the entire data management process. Due to the time assumed preparing the data and delivering it, to share and to analyse the data provided for external shareholders. In the research could be seen a common concern in handling the data as well as collecting it. It is positive to witness the concern, but simultaneously it seems the legislation needs to adapt more to this concern.



*Time and savings.* It can be a long process to develop a common way to collect data, every participant considers it to be important to have a common source. The main findings between the participants were that they all consider the current way to collect and store data was time assuming and it required a lot of resources and many hours. If it could be collected and stored more automatized, this could save hours spent collecting it and it would in that way provide savings in time. Regarding frequency, all the participants follow data on a daily-basis. For most of the participants, the most time-consuming process was to collect and prepare a report for their stakeholders. Here the average time spent for preparation was minimally one week in duration.

*Data source.* The data management process is an ongoing process for all companies and all companies consider it a crucial part of their business. The participants considered financial data to be simple to collect and use, the non-financial data required more time. In financial data, the most important variable is the cash flow.

*Sharing the data.* According to Gurin, “In a scientific perspective, “access to data and a network for collaboration.” (Gurin.J.2014,p.158) The participants consider the sensitiveness of the data and the centralized databases for storing the data was the most difficult in the data management process. 2 of the respondents manage the data on their own server and database. The rest of the companies uses an external cloud service. All the participants consider it to be important, to be able to share data and considered this currently to be a challenge to find and collect data, as well to share it with external stakeholders.

## **6. CONCLUSION**

The purpose of this research is to answer the research questions. The first research question, is to describe how the fast companies consider the data management process and how are the companies currently working with it? One of the variables that the respondents consider to be important, is to work systematically with collecting data. According to the respondents, there is a difference between the companies process and how companies work with collecting data. According to the respondents variation among

knowledge is common between fast-growing companies. According to the respondents, the difference can be recognized between industry and culture among the companies. The respondent considers the traditional companies having a need to adapt to agility and implement data solutions faster into their process. The younger companies that are younger, own a certain culture of collecting data and have a clear strategy for data process management. Referring to the theory, this can be interpreted as a form of agility the companies have. These companies intend to have certain knowledge or industry-related association to the process of collecting data. According to the interviews, there is a relation between industry and knowledge. According to the interviews, there are many existing standardized solutions, that are relatively easy to implement. So it should not be a cost factor of implementing new technology for data management. But the requirements are more specific or if it includes sensitive data, then it becomes more difficult and most companies have not a standardized process for data governance.

The second research question is, does a good data management process improve the companies process for reporting for their stakeholders? All the respondents consider this to be an important process in their operations and for some companies it includes risks, of not receiving finance. The respondents consider this as important because it is related to the companies funding. If the reporting is not done according to the agreed timeline, it will impact their financial decision. Even with a consequence, the funding can be declined. It can be perceived as important, that the companies determine their measures as soon as they will start to apply for finance. The most important data is cash flow, but if the companies will determine to use customer-related data. It requires more time to agree with the right measures for funding. The third research question is, does a good data management process improve the companies processes? According to the result, a good data management process can save the company time and resources. It can even provide the companies with cost savings, within saving in work hours. A good data management process will as well improve the companies change to receive funding a negotiate for funding. In consideration to expansion and internationalization, there are differences in requirements for funding, but also the variation of industry-specific knowledge. Due to the technological development, companies need to be more agile in adopting a data management process.

It can also be interpreted that S.Coleman theory of a maturity level, can be implemented for the companies timing of implementing the data management process. This requires a certain amount of data, so the data management can be implemented. As we are moving towards a more digital and data-based era, then the definition for SME companies can also be more categorized by the amount of data. The maturity of the company and the readiness for implementing new solutions is important for data management. The more mature companies consider it would be valuable, to be able to share the data more efficiently through interfaces, or databases for their shareholders. As mentioned earlier in the theoretical chapter, the respondents also need to work with data as ecosystems, where it would be possible to share and store it centralized. The collaboration model, which was mentioned by Gurin 2014, could as well be implemented in the current data management process among fast-growing companies.

## **6.1 Further Research**

As the amount of data is growing by the number of transactions. It is creating a lot of content and consumer-related data. What impact will this have on the consumer use of Social media, as we always make the consent to the service provider? How many are aware of what their content applies, in giving it to the provider and how will the provider use this data, or what kind of business opportunities could it have for the provider? It would also be highly important to research, how the legal regulation could be done to support the changes in data transfers. For future research, it could be interested in research, how this ecosystem could be applied in a way, so it could be done in a legal matter and that the data, could transfer efficiently? Since data sharing seems to be a crucial part, for transparent reporting. It could be a recommendation to study, how an initiative like Open banking could be applied to a governmental exchange of data.

There was previous research done relating, to how scalable architecture can be used for Big Data financial analytics: user-defined functions vs. SQL” Stockinger, Kurt; Bundi, Nils; Heitz, Jonas; Breymann, Wolfgang. Journal of Big Data; Heidelberg . The study was done with an aim to study how to use technology for supports the “flow of money in form of cash flows between different participants. “(Bundi.S& B. Heitz, B 2019,p.1) They were investigating the issue from a financial institution perspective, where “the banks’ poor capability to “quickly and accurately aggregate risk exposures and identify concentrations of risk at the bank group level, across business lines and between legal entities.”(Bundi.S&, Barayman.H.2019,p.2) For further research, a firm recommendation is to use a similar method for investigating how it could be implemented for sharing data in a compliant way. The second topic for further research could be within the area of efficient data governance models within data management.

## 7. THE LIST OF REFERENCES

### *Litterature*

Gurin J, (2014) *Open Data Now*, United States Of America, Mc Graw Hill

Gubrium,. J, Holstein J (2001) *Handbook of Interview Research: Context and Method*, Sage, London Uk

Barberis, J., & Chishti, S. (2016) *The financial technology handbook for investors, entrepreneurs and visionaries*

Christensen L, Enghdal, N, Gräås. C & Haglund L( 2010)*Marknadsundersökningen, En Handbok*, 3dje upplaga. Lund, Studentlitteratur

McGilvray,D (2008) *Executing Data Quality Projects: Ten Steps to Quality Data and Trusted Information* 2<sup>nd</sup> Edition , Elsevier Science Publishing Co Inc, New York United States

Lila Rao-Graham, Maurice L. McNaughton, Gunjan Mansingh ‘(2020) *Business Intelligence for Small and Medium-Sized Enterprises: An Agile Roadmap toward Business Sustainability* FL, USA

Soraya Sedkaoui( 2018) *Data Analytics and Big Data*, John Wiley & Sons, Incorporated, United States

Groot, Martijn (2017) *A Primer in Financial Data Management*: Elsevier Science & Technology

Bryman. A & Bell. E (2011) *Business Research Methods* 3<sup>rd</sup> Edition, OUP Oxford University Press, New York, USA

### Journals

Seetmhamraju R (2014) *Adoption of Software as a Service (SaaS) Enterprise Resource Planning (ERP) Systems in Small and Medium Sized Enterprises (SMEs)* Information Systems Frontiers; New York Vol. 17, Iss. 3, (Jun 2015):.p. 475-492.

Shouhong Wang & Hai Wang (2020) Big data for small and medium-sized enterprises (SME): a knowledge management model *Journal of knowledge management j* Vol. 24 NO. 4 2020,p.881- 897

Hassani.A, Ayachi,S (2017)A framework for Business Process Data Management based on Big Data Approach : *Centeris International Conference on ENTERprise Information Systems ProjMAN 2017 - International Conference on Project MANagement / HCist 2017 International Conference on Health and Social Care Information Systems and Technologies, CENTERIS/ProjMAN/HCist* VOL 121,p.740–747

Sliwinski.R. & Sliwinska.M (2016) Growth and internationalization of fast growing firmsn *Journal for East European Management Studies* · VOL 21, Nr. 2, p.231-253

Härting.R, Reichsteinb. C,Laemmler P, Sprengelb.A (.2019) Potentials of Digital Business Models in the retail industry – Empirical Results from European Experts: *Knowledge-Based and Intelligent Information & Engineering Systems: Proceedings of the 23rd International Conference KES2019* 159, p. 1537–1546

Coleman.S, Göb.R, Manco.G Pievatolo.A., Tort-Martorelle.X Reis.M( 2016) *How Can SMEs Benefit from Big Data? Challenges and a Path Forward* Qual. Reliab. Engng. Int., John Wiley & Sons, Ltd 2016, p. 2151-2164

Reinhold,M.& Reinhold.S.( 2014) Data-driven Intelligence for SME E-Business: A Marketing and Sales Perspective. *Marketing Review St. Gallen* Vol. 31, p. 51-59

Masato A (2013) Financing small and medium enterprises in Asia and the *Pacific Journal of Entrepreneurship and including micro-enterprises and start-ups, in the developing countries of East and South Public Policy* Vol. 4 No. 1, 2015 p. 2-32

Dennis A. Gioia, Kevin G. Corley and Aimee L. Hamilton (2013) Seeking Qualitative Rigor in Inductive Research: Notes on the Gioia Methodology *Organizational Research Methods* · January 2013: Vol 16 Nr.1, p 15-31

Mäntymäki.M, Hyrynsalmi, & Koskenvoima A, (2019) How Do Small and Medium-Sized Game Companies Use Analytics? An Attention-Based View of Game Analytics *Information Systems Frontiers*;; New York Apr Vol 22., p 1163–1178

Stockinger, Kurt; Bundi, Nils; Heitz, Jonas; Breymann, Wolfgang. (2019,) Scalable architecture for Big Data financial analytics: user-defined functions vs. SQL” *Breymann, Wolfgang. Journal of Big Data; Heidelberg* Vol. 6, Article number 46, p. 1-24

White, Sarah K ( 2020) What is process mining? Refining business processes with data analytics *CIO; Framingham* Jun15, p.1-3

### *Publications*

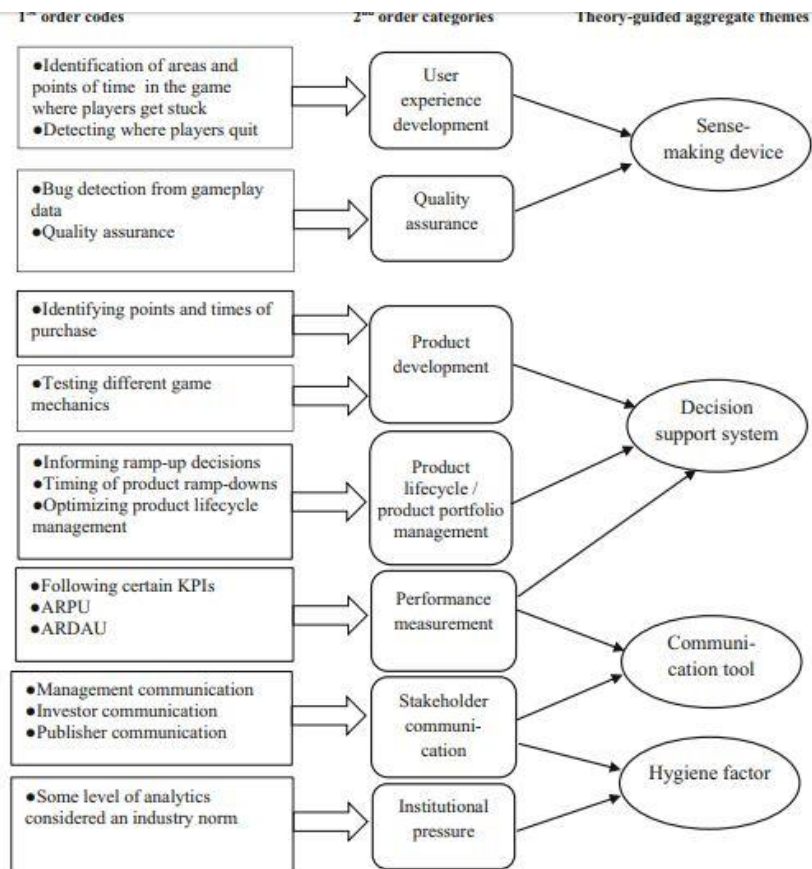
Paavola.H, Seppänen M, Eloranta.V(2021) *Datapohjaisen arvonluonnin strategiset vaihtoehdot Työ- ja elinkeinoministeriön julkaisuja* Numner 2021:3 (20.1.2021),p.1-202

Annegret Bendiek and Magnus Römer (2019) Externalizing Europe: the global effects of European data protection *DIGITAL POLICY, REGULATION AND GOVERNANC* Vol. 21 NO. 1 2019, p 32-43

## 8. APPENDIX

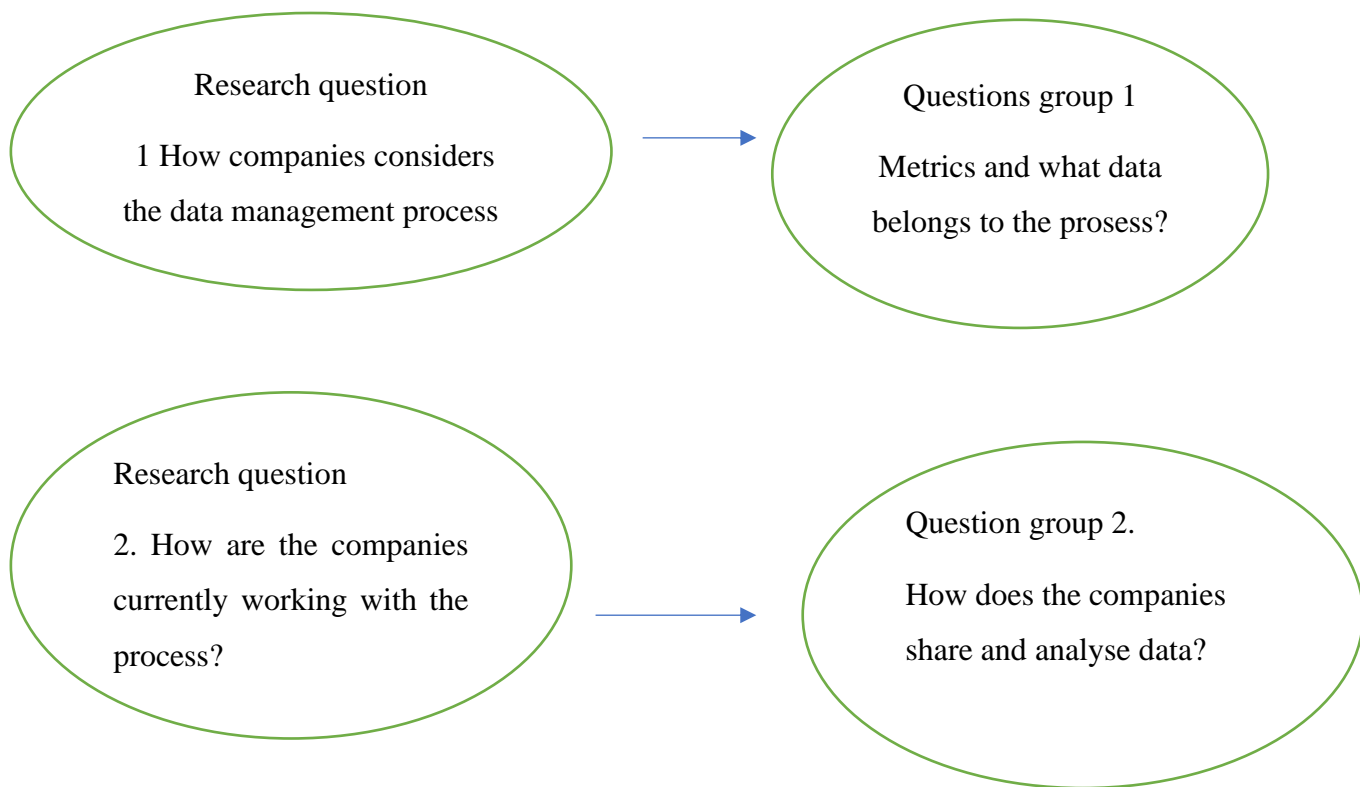
Appendix 1, *The Mäntymäki, M, Hyrynsalmi, & Koskenvoima A, (2019) model page 5*

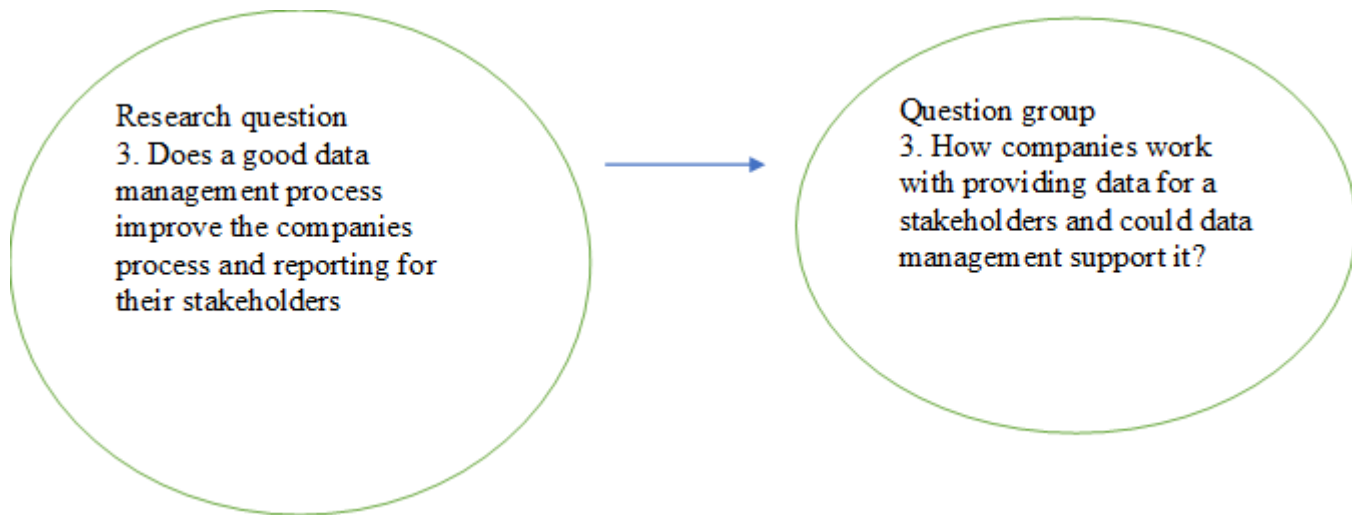
Fig. 1 The three stages of the analysis process employed in the research





Appendix 2 :*Questions in relation to the research questions*





Appendi 3. *The questions and the question group for the respondents*

Question group 1)

**1. Do you consider your business to be easily predicted and how are you following your business?**

What are your KPI:s and how do you follow them?

What is the most difficult process for your company to measure your business?

How often does your company update systems and do you consider it to be easy?

What tools are you using for the reporting?

How much time do you spend on preparing reports?

How are you currently budgeting and what systems do you use?

Question group 2)

**2. For what purpose does your company use data for and how easy do you consider the process to be?**

Do you have any previous experience of data projects

How do you manage your risks and data policies

- a) external server, external, pga gdpr
- b) own server
- c) outsourced
- d) in-house expert.

What data support your decision-making process and for which decision do you use data for?

Which department will have the most use of the easy access data?

Do you consider there to be any risks in handling and collecting data?

What business opportunities could you see within data management and how could it support your business?

Question group 3.)

### **3. How do you provide information for your financier?**

In what will you be investing in the following years?

How often do you follow data and make new business decisions?

What challenges do you have in expanding?

How often do you provide information for your financiers?

How important do you consider it to be, that your data is provided in real-time for your investors.

How does your financiers access your data and how do you provide it to them?

How often does your financiers ask you for further details ?

Appendix 4 Data Governance.

<p><b><u>Top-down governance and decision flows:</u></b>          Command and control          Clear links between executive-level data governance and operational departments          Alignment executive walk and talk; lead by example</p>	<p><b><u>Bottom-up governance and decision flows:</u></b>          Some decisions made by individuals and via grassroots initiatives          Data naming standards driven by users          Organizational ability to support grassroots initiatives          Stewards, data governance staff need to be visible and approachable</p>
<p><b><u>Silo-in governance and decision flows:</u></b>          Bring in representatives from multiple groups to collectively agree on action          Governance and stewardship councils          Federated model can make sticky decisions but needs to be given authority to decide on models and processes          Representatives need to have authority in their own constituencies</p>	<p><b><u>Center-out governance and decision flows:</u></b>          CDO or CIO ask experts to specify data models and processes          One or more centralized resources decide          Educate all stakeholders; consider enough options</p>

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