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The Balanced Scorecard during the early stages of a tech firm -

A multiple case study regarding performance management in Swedish tech startups

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Abstract

The rapid advances in technology and increase of tech investments across all the industries have promoted the emergence of several startups. Unfortunately, not all startups succeed despite of having good initial ideas. One reason to the poor business performance could be a lack of managerial control. Researchers and industry experts believe that performance management could support tech entrepreneurs to monitor and control the drivers that promote growth and their success. However, there is a lack of studies that could support these thoughts about its suitability for tech startups. Therefore, this study gathers empirical findings from Swedish tech startups as well as industry experts to discuss this issue. The findings show that a performance measurement system such as the Balanced Scorecard is a suitable practice for tech entrepreneurs. It also brings some insights about how the performance measurements evolve as the firms mature.

Key words: CSF, KPI, Performance management, the Balanced Scorecard, BSC, tech, startups, entrepreneurship, fast growing, SMEs, success stories, from idea to IPO, life cycle of an organization

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Abbreviations used in this study

BSC = Balanced Scorecard
CSF = Critical Success Factors
FGF = Fast Growing Firm
FGSME = Fast Growing Small and Medium sized Enterprise, less than 50 respectively 250
IP = Intellectual property
IPO = Initial Public Offering
KPI = Key Performance Indicators (measure)
MCS = Management Control System
MVP = Minimum viable product
PM = Performance Management
PMS = Performance Measurement System
R&D = Research and product development
SME = Small and Medium sized Enterprise, with less than 50 and 250 employees respectively
VC = Venture Capital

1. Introduction

This section provides crucial background knowledge on the scope of the tech industry and the balanced scorecard. Further, the reader will find the problem discussion, the purpose and the contribution of this research.

1.1. Background: Startups in the Swedish tech industry

Over the last two decades, information technology (IT) and information communications technology (ICT) have become key drivers for economic and sustainable growth. The rapid diffusion and advancements of technology, the Internet, mobile telephony, and broadband networks have promoted the emergence of many startups within this fast-paced field (Pilat, 2004; Olin, 2016). Usually a startup is defined as a young and not-fully-developed business that possesses very limited resources (Zulehner, 2010; Bresciani and Eppler, 2010). Besides, according to Adam D' Augelli, an associate at a San Francisco venture capital firm, a company is a startup until it finds a product or market fit and has begun to scale (Hall, 2011).

Sweden, as an early adopter of new technologies and the biggest market place in the Nordics, attracts and drives the emergence of ground breaking, successful and fast growing tech startups (The Swedish Trade & Invest Council, n.d; Olin, 2016). Being "tech" usually means that the startups have a competitive advantage based in technological innovation. Sweden has experienced growing IT investments across all the national industries, which is a good indicator of Sweden's healthy environment for these startups (The Swedish Trade & Invest Council, n.d; SCB, 2007). According to Niklas Johnsson, Senior Investment Advisor at The Swedish Trade and Investment Council, Stockholm is the city with the largest number of billion dollar startups in Europe. Some of the world's most successful tech companies were born in Sweden, such as Spotify, Skype, Unibet, Tobii, iZettle and Klarna. In fact, Sweden has about 50 companies annually on the Fast500 EMEA (European, Middle East and Africa) list, which is a benchmark of fast-growing technology companies (Olin, 2016).

Nevertheless, not all startups are success stories and despite of having good initial ideas, many struggle with monetizing their R&D efforts, which result in that many of them do not survive their early stages (Feinleib, 2011; Ejermo & Xiao, 2014; Löfsten, 2015). According to Olin, Riminton and a Investment Manager, some of the major reasons for poor performance and failure are that: 1) tech startup founders do not understand which areas that could potentially help them to thrive in the short and long-term, 2) tech founders lack managerial expertise to strategize, monetize efforts and promote good financial performance, and 3) they lack a mechanism to translate the vision and strategy into concrete objectives. According to these three industry experts, tech managers could benefit greatly from a framework by which they could monitor, especially their short-term performance, and avoid the troubles of neglecting the business side of the firm. Therefore, the industry experts see a need for better insights in the topic of performance

management among the tech startups and discuss that this could help them survive through their early stages.

1.2. Background: The Balanced Scorecard (BSC)

Corporate strategy is described as the actions that a company aims to perform in order to reach its objectives and performance measurement is used to oversee the implementation of the strategy. The best-known and most widely used system for measuring the performance in a company is the Balanced Scorecard (BSC) and this is the reason why this study focuses on this specific system. As the strategy is executed, the Balanced Scorecard provides feedback and insights for decision-making, assessing and rewarding performance. The feedback signals whether the strategy is working or not, and it guides actions to improve the performance of the strategy (Atkinson et al., 2012). Evaluating the performance of the company as a whole, and its various organizational units, is crucial for building long-term success. Adages such as "what gets measured gets done" or "what cannot be measured, cannot be improved" describe that implementing appropriate performance measurement ensures that actions are aligned to the business strategies and objectives, which is the basis to assess and improve performance (Kennerley & Neely, 2002; Anthony et al., 2014). Deriving from this discussion, it could be argued that the Balanced Scorecard (BSC) could prove to be the framework that the industry experts see the need for.

1.3. Problem discussion: The Balance Scorecard in tech startups

Chapman (2005) discusses that for a company to become successful nowadays, it is crucial to measure both financial and non-financial indicators that drives the firm's success. According to Kremer (2013), high-tech and low-tech firms use the same financial indicators to measure their performance but they differ when measuring non-financial indicators. High-tech firms use more non-financial indicators and this could derive from that they are focused on making new products, penetrate new markets, and obtain funding. De Boer et al. (2010) claim that the critical success factors of ICT organizations change over time depending on which business orientation they have through their different stages of development; hence, their performance measurement should change as they mature. Nevertheless, there is a visible gap in the literature regarding tech startups and performance management. Several authors discuss that most studies and literature on performance management have concentrated primarily on large organizations (Zaman, 2003), with only a small amount of studies involving small to medium enterprises (SMEs) (Tan & Smyrnios, 2011). Hudson et al. (2001) argue that there is a need to study the relevance of existing performance management approaches, such as the Balanced Scorecard (BSC) for SMEs, to identify the appropriate design and implementation of them in these organizations. Furthermore, Lonbani, et al. (2016), Gumbus and Lussier (2006) also encourage further research about the BSC, particularly regarding small entrepreneurial organizations, which is very relevant for the tech startups. Another aspect is brought up by Tan and Smyrnios (2011), that fast growing SMEs might emphasize different performance measures at different stages of their organizational development, which is a topic argued to need further research.

Thereupon, it can be concluded that tech companies could benefit from using performance measurement systems such as the BSC, especially during their early stages where they need support in order to better understand their business and find a balance between profitability, growth and control. Unfortunately, there seems to be a lack of literature about performance management in small growing tech companies and how it should be implemented in their specific situation.

1.4. Purpose and Research Question

Based on the previous discussion, this thesis aims to explore and provide further knowledge about performance management in Swedish tech startups. This thesis will aim to highlight what are the most important areas that drive growth and should be monitored throughout the startup stages of development in order to succeed in the short and long-term. The authors will aim to present a model to visualize how performance management evolves through the different stages of development. Therefore, the following research and sub research question have been established:

- How suitable is the balanced scorecard as a practice for for-profit tech startups?
    - If it is, how should tech startups implement as they mature overtime?

1.5. Contribution of the thesis

As case studies of this kind are scarce, this thesis makes an academic contribution by providing a better understanding about performance management in the Swedish tech startups. Specifically, it looks at how suitable the Balanced Scorecard can be for tech startups and how performance management evolves throughout their initial stages of development. This thesis also aims to contribute with practical recommendations for startups managers about how to work with performance management, especially with the Balanced Scorecard in order to benefit from it.

2. Theoretical Framework

The following section comprises four subsections that will aim to support this research. It begins with an overview about the balanced scorecard (2.1) and the benefits and limitations of implementing it in a business. Successively, (2.2) will bring the insights regarding the factors that drive growth and success among small technology based firms, which should be considered when measuring performance. Thereafter, a literature review about how to segment the development stages of a startup (2.3) is presented in order to be able to assess a startup by its maturity objectives. Finally, this section ends with a review of the theoretical framework (2,4).

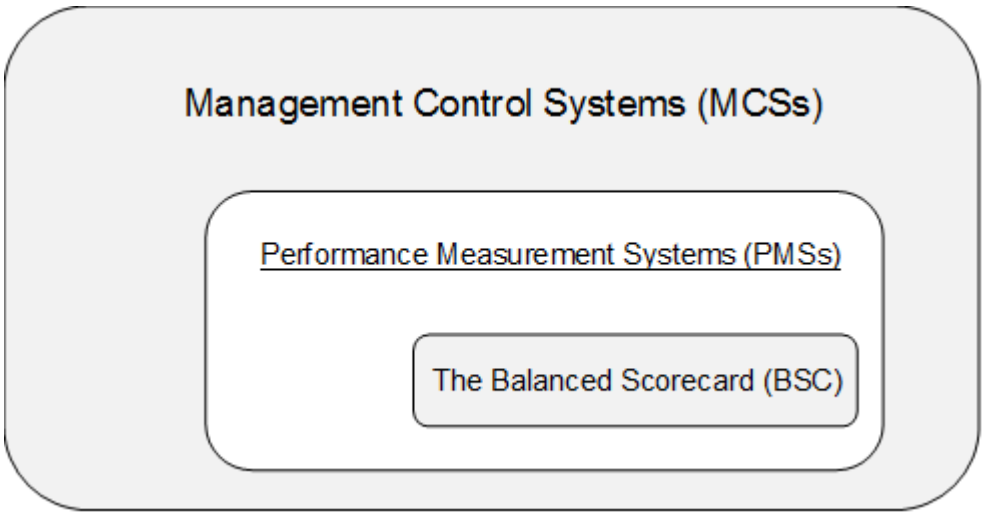
2.1. The Balanced Scorecard (BSC)

To be able to answer the research question it is important to first present the balanced scorecard (BSC) and why companies use it. However, this study brings up several topics regarding management control that would be beneficial to explain initially.

A Management Control System (MCS) is a tool for the management in a company to monitor and control the organization. These systems become more important as a company grows, because with an increasing number of employees, the motivation, monitoring, coordination and flow of information in the organization becomes too complex to be handled through solely personal interaction. Therefore, these matters have to occur through an appropriate MCS, which becomes a necessary infrastructure to scale-up the organization. The growth of a startup and the adoption of MCSs are occurring simultaneously, reinforcing one another during the first years of the firm. A higher number of employees, presence of venture capital, international operations, and revenues are positively associated with the rate of adoption of MCSs (Davila & Foster, 2007) and therefore MCSs can be said to facilitate growth in a company (Simons, 1995; Flamholtz & Randle, 2000). During the first years of a startup, the amount of control systems usually increases rapidly up to the point when the companies have approx. 50 employees, after which the increase slows down (Davila & Foster 2007).

As mentioned, one type of Management Control System (MCS) is the performance measurement system (PMS). Several frameworks of this kind has been proposed but the best known and most widely used in the world is the Balanced Scorecard (BSC), which was introduced by Robert Kaplan and David Norton in 1992 (Atkinson et al., 2012). The following model shows how these systems relate to each other.

Model 1: How the balanced scorecard is connected to management control



This study focuses on the BSC because of its popularity and its way of dividing performance measurements into different perspectives. Since this study is regarding small startup companies, with less than 50 employees, this literature review will include much literature discussing small and medium sized enterprises (SMEs), which are defined as companies with less than 50 and 250 employees respectively (European Commission, 2016). A literature review produces several reasons why SMEs should implement the Balanced Scorecard (BSC) and the following are the most important examples.

Table 1: Benefits of implementing the Balanced Scorecard in SMEs.

Author (year)	**Benefits**
Gumbus & Lussier (2006)	Promotes growth—due to focus on long-term strategic outcomes, not just short-term operational results.
	Tracks performance—individual and collective results can be tracked against targets in order to correct and improve them.
	Provides focus—when measures are aligned to a few critical strategies, the BSC provides focus on what is important to the company.
	Alignment to goals—when one measures what is truly important to success, the measures become linked and support each other. Alignment occurs across the organization.
	Goal clarity—the BSC helps respond to the question, "How does what I do daily contribute to the goals of the enterprise?"
	Accountability—individuals are assigned as owners of metrics in order to provide clear accountability for results
De Boer et al. (2010)	Translates the vision and strategy of the enterprise into concrete objectives
Von Bergen & Benco (2004), Zinger, (2002),	Helps SMEs to better plan for the long term and help supporting the innovation and strategy implementation needed for the organization to achieve its objectives.

Costa Marques (2012), Andersen et al. (2001) Gomes & Lírio (2014)	
Rickards (2007), Lonbani et al. (2016)	Helps SMEs with risk assessment, which is extra important for SMEs since they often have small resources and are active in areas characterized by rapid change.
Atkinson et al. (2012)	Clarifies strategy, objectives, targets etc.
	Communicates the company's strategic objectives.
	Motivates employees to help the company to achieve its strategic objectives.
	Evaluates the performance of managers, employees and operating units.
	Helps managers to allocate resources to the most productive and profitable opportunities.
	Provides feedback on whether the company is making progress in improving processes and meeting the expectations of customers and stakeholders
Anthony et al. (2014)	Measure the success of the business.
	Helps managers to compare the performance in the different perspectives and see if they improve together or improve at the expense of another perspective.
	Provides a fast focus of action if results are not as expected.
	Helps informing, motivating and govern both internal and external stakeholders.
	Improves internal learning and communicating for example the responsibilities in the organization.
	Helps creating an overview of the past, present and future outcomes of the business.
	Helps to retain a competitive advantage in both present and the future.
Kaplan & Norton (1993), Maryska & Sladek (2015)	Helps managers to understand their business in a more interlinked way through cause and effect relationships
Garengo et al. (2005)	Helps managing uncertainty, innovate products/services and support change processes
Simons (2000), Chapman (2005)	Helps finding a balance between profitability, growth and control

Using the BSC can also argued to be beneficial for startups seeking venture capital. To attract investors, Sawyer (2009) state that an entrepreneur needs to develop a detailed financial model to be able to explain the success strategies that drive value out of the business proposition. Ries (2011) argues that performance measurement helps seeing which activities drive value in a startup and therefore the BSC could help the entrepreneur explaining the value creation. Davila and Foster (2007) continue this discussion and state that, a third party, such as a business partner or investor, often require that a startup adopt more management control systems (MCSs) when the cooperation begins.

As a conclusion, the main objective of using the BSC is to help the implementation of the company's chosen strategy. When designing the BSC for a company, managers have to identify which factors that are crucial for the success of the company, the critical success factors (CSFs), and decide what dimensions of performance that the organization seeks to develop. Thereafter, measurements, key performance indicators (KPIs), are assigned in

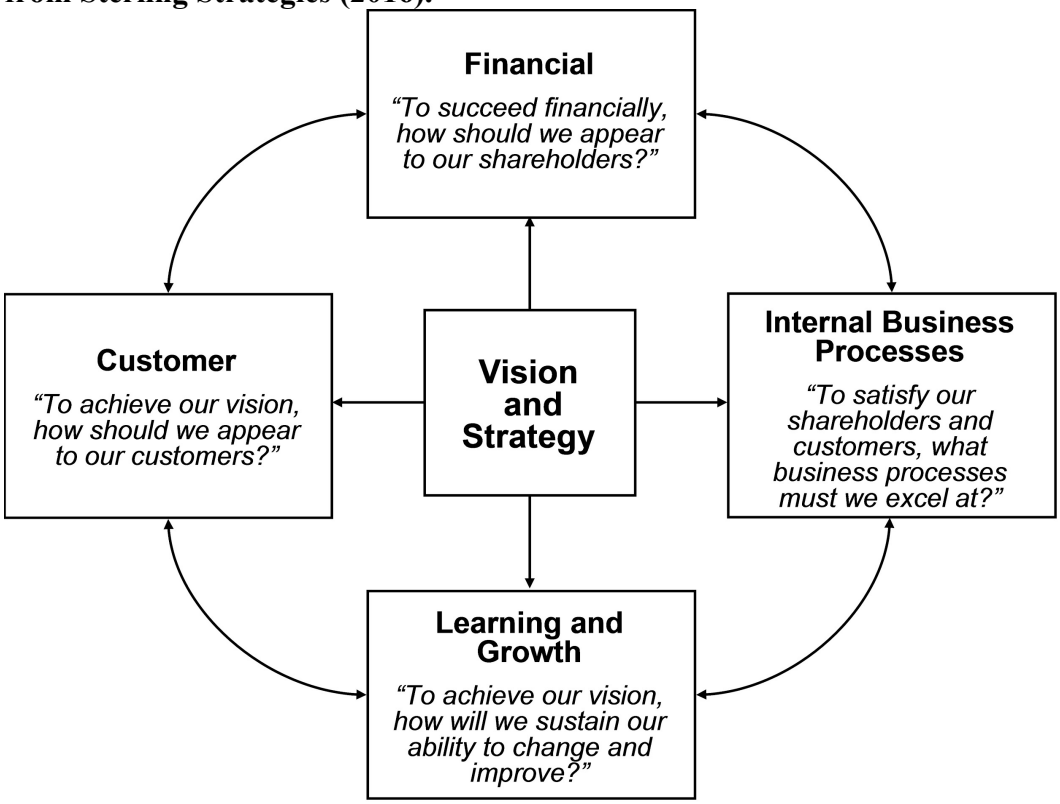
order to assess the performance and these should be in quantitative form so that the performance is easy to understand and compare (Atkinson et al., 2012).

2.1.1. The four perspectives of the Balanced Scorecard (BSC)

The BSC divides objectives and measures into 4 different perspectives and the financial performance is only the focus in one of them. If a firm focus mainly on the financial indicators, it will lead the organization to become short-term oriented by only looking at past actions, which becomes a problem as the firm sacrifices long-term value creation for short-term performance. Therefore, managers should be driven by not only the short-term indicators, but mostly by non-financial performance indicators when making strategic decisions (Kaplan & Norton, 2001).

When designing the BSC into these perspectives, it is important to consider how many measures to use. The management has to weigh the cost, the benefits, the potential distraction of too many measures and the ideal amount differ among companies (Anthony et al., 2014). In order for the BSC to be beneficial in practice, it is necessary that the system is not perceived as overly complicated work (Atkinson et al., 2012). Kaplan and Norton (1992) suggest 4 measures per perspective and the following model of the 4 perspectives in the BSC show how they cooperate to complete the vision and strategy of an organization.

Model 2: The Balanced Scorecard according to Kaplan and Norton (1996). Taken from Sterling Strategies (2016).



The **Financial Perspective** contains objectives and financial performance measures, such as operating income and return on investment, that represent the ultimate success for profit seeking companies, how the strategy implementation of the company's is increasing the value for its shareholders. The **Customer Perspective** describes how a company intends to attract and deepen relationships with its targeted customer. The **Internal Business Process Perspective** identifies the objectives for: operations management, customer management, innovation, regulatory and social processes. Furthermore, it determines how the company should create and deliver the value proposition to its customers but also achieve the productivity improvements. The **Learning and Growth Perspective** identifies the objectives for: the skills and knowhow in the human resources, the company's IT systems and the organizational culture & alignment (Atkinson et al., 2012).

2.1.2. Empirical studies promoting the Balanced Scorecard (BSC)

To be able to answer the research question about how suitable the Balanced Scorecard (BSC) is for tech startups, it is important to review empirical studies related to the subject. There are many general studies regarding the BSC and the very most of them conclude that the implementation of the system increase the overall performance of companies. For example, De Geuser et al. (2009) study 76 business units in European companies that had recently developed a BSC, and the study conclude that the implementation of the BSC has a positive impact on organizational performance. Similar findings are made by Ittner et al. (2003), Chi and Hung (2011), Braam and Nijssen (2004), Davis and Albright (2004), Buhovac and Slapnicar (2007), Farooq and Hussain (2011).

Despite the fact that most research on performance measurement has concentrated primarily on large organizations (Zaman, 2003), with only a small amount of studies involving small and medium sized enterprises (SMEs) (Tan & Smyrnios, 2011), Lonbani, et al. (2016) state that most studies regarding the Balanced Scorecard (BSC) in SMEs have recommended the system. For example, Andersen et al. (2001) note that the use of the BSC and its related management procedures may prove just as beneficial to SMEs as to large firms. Similar conclusions are made by Von Bergen and Benco, (2004), Zinger, (2002), Costa Marques (2012), Gomes and Lírio (2014).

Some of the studies in this literature review concern fast growing SMEs (FGSMEs) and since they are fast growing, they can be argued to represent a form of "best practice" to some extent for the startups in this study. A review of the literature produces the following examples of studies promoting the implementation of the Balanced Scorecard (BSC) in SMEs:

Table 2: Studies promoting BSC implementation in small and medium sized enterprises (SMEs).

Author (year)	Participants	Subject	Result	Recommendation
Machado (2013)	SMEs	PM tools & BSC	The usage of the BSC is significantly lower in SMEs than in large companies. PM tools & the BSC is only used by 5 % of SMEs. The majority are unaware of the BSC and the rest consider PM unfruitful	SMEs should consider the use of the BSC
Kremer (2013)	High & low tech firms	BSC	High tech firms use the BSC and non-financial measures more than low tech firms. The reason can be that the BSC is more beneficial for firms focused on innovation, R&D and penetrating new markets	High tech firms should use the BSC
Tan and Smyrnios (2011)	Successful young FGSMEs	PM	FGSMEs work with strategy and measurements according to the BSC. They measure their performance from various sources of information and use it for building strategies.	SMEs should use PMSs such as the BSC
Barnes et al. (1998)	SMEs	PM	FGSMEs work more with financial management for strategy building than slow growing SMEs	SMEs should use financial planning as the BSC suggest
Sousa, et al. (2006)	English SMEs	PM	PMS are rated as important but less used. Financial measures are most used; measures about customer requirements are used to some extent while innovation and learning measures are less used.	SMEs should use PMSs more
Sousa, et al. (2005)	Portuguese SMEs	PM	PMSs are rated as important but less used and the BSC is less used in SMEs than in large companies. The most common measures are in financial terms, customer performance and employee training	SMEs should use PMSs more
Rickards (2007)	SMEs	BSC	The use of the BSC in SMEs is fairly limited	SMEs should use the BSC and non-financial measures more
Monkhouse (1995)	SMEs	Non-financial measures	A high proportion of SMEs use quantitative nonfinancial internal benchmarks, ranging in descending order of importance from quality, competitive performance, resource utilization, flexibility, and innovation.	SMEs should use non-financial measures more
Gumbus and Lussier (2006)	Small firms	BSC	Only a few small firms are using the BSC	SMEs should implement the BSC

2.1.3. Limitations and hinders of the Balanced Scorecard (BSC) for small and medium sized enterprises (SMEs)

As discussed, most literature recommends the implementation of the BSC, although there are a few studies concluding that there are problems regarding BSC implementation in an organization. For example, in a study by Antonsen (2014) the employees are torn between performing a good job according to them and according to what is measured,

which becomes stressful for them. The study concludes that varied customer demands and complex work tasks in hectic environments make it difficult to use the BSC in practice.

There are also several obstacles in SMEs that limit their effective implementation of the BSC and these are the lack of capital, managerial expertise (Szyszka, 2003; Rickards, 2007), knowledge, strategic thinking and supportive control systems (Rickards, 2007). Another hinder can be the mindset of the entrepreneur and some of them are mainly interested in the technical development of the product and the initial sales than managerial aspects such as management control (Chandler & Jansen, 1992; Willard et al., 1992; Davila & Foster, 2007). These issues result in that strategic control is less developed in SMEs than in large enterprises (Henschel, 2003) and that strategic planning in SMEs often has a minor role in relation to the operational aspects of their business (Rickards, 2007). That is a reason why the BSC is often less formal in small firms than in bigger corporations (Von Bergen & Benco, 2004) and in SMEs, non-financial measures are often intuitive and subjective, instead of objective and quantitative (Jarvis et al., 2000). Hudson et al. (2001) also discuss that the BSC becomes too resource intensive in many SMEs and that the measures produce an overload of data that fast becomes outdated. Therefore, If the BSC should benefit SMEs, the system has to be adapted so it is very resource effective, adds value in both short and long-term, but also is very dynamic so it easily adapts to the fast changing strategies that are typical for SMEs (Hudson et al., 2001).

Finally, Sousa et al. (2006), discuss that there is a lack of understanding among SME managers regarding the cause and effect linkage between strategy and results, which hinders the beneficial learning that these linkages enable (Ries, 2011).

2.1.4. What to do with the outcome of the Balanced Scorecard (BSC) measures

After discussing the suitability of the Balanced Scorecard (BSC) related to tech startups, the rest of this literature review is mostly focused on the sub question of the research question, how an implementation of the BSC should be made in tech startups
After obtaining the outcome of the measures it is important that all concerned in the company get a clear overview of the performance so the organization can learn, be motivated and correct their behavior for improvements. Gumbus & Lussier (2006) discuss that many small firms use a traffic light reporting system and this system is argued to be easy to understand among the staff. In this system the color red is used to indicate targets not met, yellow indicates targets in danger of not being met, and green indicates those met.

Anthony et al. (2014) and Paladino (2011) discuss that benchmarking should be used to compare and improve processes but, according to Tan & Smyrnios (2011), most FGSMEs do not measure performance in relation to their competitors. They are usually aware of competitors´ strengths, weaknesses and strategies but instead of comparisons they aim to be the best in their field (Tan and Smyrnios, 2011). These findings are

supported by the Australian Bureau of Statistics (1997) identifying that only one-in-five of micro and small firms compare performance (formally or informally) with other enterprises, which larger companies are much more likely to do.

Furthermore, it is important to align the goals in the organization so the individuals strive for the same goals as the company in general. To ensure this goal congruence, the BCS should be linked to personal rewards, incentives and compensation programs (Speckbacher et al., 2003; Malmi, 2001; Paladino, 2011). Tan &. Smyrnios, (2011) bring up that if FGSMEs have KPIs evaluating employee performance against agreed targets, the KPIs are often used to assess bonus payments to staff. Furthermore, Gumbus & Lussier (2006) state that companies that have used the BSC for a while are applying it to compensation, employee performance appraisal, and capital budgeting.

2.2. Critical success factors related to tech startups

Even though there are many studies attempting to identify the determinants of survival and growth of new firms, there is no real agreement as different studies produce different results. In a study by Lasch et al. (2007) 200 startups in the Information and communications technology (ICT) sector are compared. The study concludes that the most important factors producing sustainable effects and positively related to growth are linked to the initial organizational setting, such as firm size and capital at the early stage, customer structure and market orientation. Client base that already exists at the startup phase becomes a critical success factor, as the firm can provide services to first customers and be profitable from the start, and consequently increasing the chances of growth. The introduction of new capital from other private organizations becomes also a success factor, as it tends to increase the growth of ICT services. Surprisingly, R&D co-operation with other firms turn out to be insignificant; that might lead to the thought that R&D co-operations may be more important for the survival period of 3 years, but not for a long-term growth. Similarly, a diversification of products and services does not have a strong significance.

The human capital on the other hand, such as education level, working experience in SMEs and entrepreneurial expertise also have a positive impact on the growth of the startups, but to a less extent (Lasch et al., 2007). However, Gregory and Sheahen (1991) identified managerial expertise as a success factor to effectively and efficiently shift the organization from a research firm to a commercial business. If the manager is a scientist and lacks appropriate business expertise, the firm will face growth pains when the organization changes from a research firm to a commercial business (Gregory & Sheahen, 1991; Davila & Foster, 2007). These problems are common in university spin-off tech ventures because academic entrepreneurs often lack the skills to commercialize the developed technological assets (Wright et al., 2007).

Venture capital is another factor that can be considered as a critical success factor. VC-backed companies grow much faster, than companies that are not, and this might derive from the acquisition of managerial expertise, network and the financial resources from an investor (Davila & Foster, 2007).

Innovation and patent development are also important determinants for the survival of new technology-based firms, especially during the initial years. To truly benefit from the innovation, business resources, such as business plans and analysis of the technology development, should support it in order to achieve positive development and long-term survival Löfsten (2015). In the same manner March (1991) emphasize that it is crucial for a firm's survival to keep an appropriate balance between exploration activities, such as R&D, and exploitation activities, such as commercialization.

Tan & Smyrnios (2011) discuss that FGSMEs seem to pay critical attention to the people aspects of their organizations (employees) and the markets (customers). Firstly, in FGSMEs the entrepreneurs are key figures that have high business creation expertise (Barkham et al., 1995; Tan & Smyrnios, 2011) and their presence influence to accelerate growth and encourage innovation as well as exploitation. In fact, the entrepreneurs that have several companies tend to perform better. Furthermore, when comparing FGSMEs with slow-growing SMEs, FGSMEs put more emphasis on their human capital and on the extensive usage of measures regarding staff feedback, training, talent retention and their performance. For example, FGSME managers highlight the importance of providing employees with flexible environments and career opportunities as a way to reduce churn (Tan &. Smyrnios, 2011). In fast growing firms (FGFs), there is also a strong emphasis on employees (Nicholls-Nixon, 2005; Tan, 2007). Lonbani, et al. (2016), recommend regular face-to-face meetings among the employees in the organization in order to uncover and share relevant information. The staff should also be encouraged to come up with ideas about how the firm can accomplish their scorecard objectives (Lonbani, et al., 2016; Tan & Smyrnios, 2011). These issues are important for FGSMEs because they are often active on markets that are naturally unpredictable, thus these practices can help to reduce the organizational uncertainty (Lonbani, et al., 2016).

FGSMEs are also market-oriented, and they put a high priority on building customer relationships and increasing customer satisfaction (Tan & Smyrnios, 2011). They regularly seek customer feedback in order to improve their businesses according to the requests and complaints of the clients (Tan, 2007). According to Tan and Smyrnios (2011), fast growing firms often aim to use a differentiation strategy and they seek to comprehend the customer needs in order to add unique value. Clearly, this strategy is dependent on the close customer relationships and personalized contacts that the firm has (networking attributes). There is a focus for customer-led improvements, which are manifested by the increase of customer-based measures, through for example surveys and customer complaints (Stone & Banks, 1997).

Another success factor mentioned in the literature is the ability to learn from your business and change your strategies accordingly. Ries (2011) discuss that a startup should successfully grow through a cycle of "building - measuring - learning" and this learning should guide the path in developing successful strategies and products. To start this learning as soon as possible, it is important to develop a "Minimum viable product" (MVP) and through the market introduction, the managers can start to learn about the customer demands through their reactions to the product. To learn about the market

potential and demands of different customer segments, it is also important to look at the performance of each group of customers, instead of the cumulative totals (Ries, 2011). Finally, another way of learning is possible for startups that run their business on the web. For example, they can gather huge amounts of quantitative data about the users and their online experience through their software. McIntyre (2011), remarks that these companies should measure as much as possible regarding their business, in order to increase learning and intelligent decision-making.

In the following table, the authors have gathered the most important aspects from the literature regarding critical success factors (CSF).

Table 3: Critical success factors (CSFs) literature review.

CSF Literature Review		
Author (year)	**Identification of CSF through key words**	**Significance**
Target of study: ICT startups		
Lasch et al. (2007)	Human capital (education level, working experience on SMEs or entrepreneurial expertise)	Not strongly significant
	Other managerial expertise, such as accounting management	Not strongly significant
	R&D co-operation with other firms	Significant for a 3 year period, but not strongly significant for long-term growth
	Diversification of products and services	Significant for a 3 year period, but not strongly significant for long-term growth
	Customer related factors	Significant
	Financial factors (available capital)	Significant
	Initial organizational settings (firm size and high available capital at the early stage, customer structure or client base and market orientation)	Significant
	Introduction of new capital from private organizations	Significant
Target of study: Science-based SMEs		
Gregory & Sheahen (1991)	Managerial expertise and competences	Significant
	Balance between exploration and exploitation activities	Significant
Target of study: New technology based firms		
Löfsten (2015)	Availability of business and innovation resources	Significant
	Concrete business plans	Significant
	Patent development	Significant

	Strategic use of patents	Significant
	Investment planning	Significant
	Analysis of technology development	Significant
	Custom made products	Significant
	Business localization	Significant
	Competent human capital	Significant
	Training and employee development	Significant
Target of study: Fast-growing SMEs		
Tan & Smyrnios (2011)	Pay critical attention to the people aspects of the markets (customers) and their organizations (employees).	Significant
	Business creation expertise	Significant
	Customer focus	Significant
	Customer relationship	Significant
	Customer satisfaction	Significant
	Career opportunities	Significant
	Flexible working environments	Significant
	Networking (relationships and personalized contacts)	Significant
Target of Study: Lean startups		
Ries (2011)	Cycle of "building - measuring - learning"	Significant

2.3. The growth of the startup explained through stages

According to Cuervo et al. (2007) and De Boer et al. (2001), companies change their focus and business strategies as they mature over time. Depending on the current stage of development, the firm has to identify which areas are the most critical for success and ensure that the resources are spent there. Consequently, any used performance measurement system, such as the BSC, has to take into consideration the maturity level and its current specific objectives.

Therefore, in order to employ the BSC in a startup, one must know how to divide the early stage of a startup in a clear-segmented way. Phelps et al. (2007) discuss that companies grow over time through sequential stages of development as they mature in their structures in order to adapt and support their growing demands from both internal and external environments. A company normally moves to the next stage or an upper level of development after a revolutionary period, which is a period where the company

is challenged for some reason to improve their business (Greiner, 1998). This period is also described by Phelps et.al, (2007) as a "tipping point" and reflects that the current organizational strategies are outdated by the time and place, and do not work properly as they do not allow the company to secure its position in the industry.

Phelps et al. (2007) explains that classification models are simplifications of the complex processes in the growth of an organization but they are also a useful way of capturing the main patterns of organizational growth in a systematic way. Even though that the organizational life cycle has its flaws, it is still a common concept to identify and assess the current stage of a company and the required steps for further development (De Boer et al., 2001; Phelps et al., 2007).

2.3.1. Models explaining organizational growth in the early stages of a company

Different authors segment the startup life in different ways. Moore (1994) proposes a model to explain the business growth of science-based small firms and his model consist of four stages: 1) conception and development, 2) commercialization, 3) growth, and 4) maturity; in which startups are divided into two distinct stages: 1) Research & Development and Prototype Development activities, and 2) Commercialization of Products. Moore's model can be strongly related to the tech startups because of their science and technology-based nature. Stettner et al. (2014) propose another stage model, which four of the six stages can be related to a startup. The related stages are: 1) Background, which is focused on R&D and identification of customers' needs, 2) Startup, which is distinguished by producing/manufacturing the firm's offer and serving to the needs of the customers, 3) Growth, whose orientation is towards increasing sales, and 4) Consolidation, which is distinguished by market expansion and scaling up.

Xiao (2011) elaborates that any model should take into consideration that firms do not necessarily pass through all the suggested development stages. The early stages of a startup can be merged and overlap each other because the founders might have developed or found potential customers, before the actual establishment of the firm or product development. Xiao's model consists of two stages related to startups: 1) Startup: "Firms have just registered and their products/services are being developed and initial potential customers are being validated. The firm would normally not be trading and therefore not making a profit. Exceptionally, it is possible for a specific firm to be profitable in the startup stage", and 2) Early stage: "Firms are producing products and services for early customers, but would normally be unprofitable. This also includes early stage firms that are profitable".

Other studies segment growth models by identifying differences in the activities and behavior patterns characterizing the startups stages. Mueller, Volery and Von Siemens (2012) explain that the role and behavior of the entrepreneur generally evolve as the firm becomes more established. Their first stage "Startup" has a focus on identifying the business opportunity to capitalize, prototype development, and deals with concrete activities such as writing a business plan, organizing a startup team, looking for a

strategic location, etc. Besides, Hanks et al. (1993) point out that entrepreneurs work closely with suppliers and early adopters to fine-tune their products and services during this stage. As the startup matures and expands over time, there is a shift towards managing and financing growth. The second stage, by Mueller, Volery and Von Siemens (2012), labeled "Growth" is called "Expansion" by Hanks *et al. (*1993), and emphasizes the shift of the entrepreneurs' focus from product development activities to sales and management accounting activities, such as record keeping. In addition, this shift implies that the organization also have demands for improvements in infrastructure and specialization in administrative as well as marketing roles (Hanks & Chandler, 1994).

The following table represents a summary of the life cycle literature related to the startups:

Table 4: Literature review related to the startup growth model

Life cycle literature review related to startups	
Author (year)	**Stages descriptions**
Moore (1994)	1) Conception & Development: activities related to research and prototype development
	Startups are divided into two distinct stages:
	1.1) Research & Development and Prototype Development activities
	1.2) Commercialization of Products.
	2) Commercialization, focus on customer interaction and sales
	3) Growth, focus on enhancement of the organization and profitability
	4) Maturity, established sustainable business model
Xiao (2011)	1) Startup, focus on product/service development and validation of potential clients
	2) Early Stage, focus on producing products/services for early customers
	3) Later Stage, at this stage firms have a have generated significant revenue growth and generated profits for several years
Stettner et al. (2014)	1) Background, which is focused on R&D and identification of customers needs
	2) Startup, which is distinguished by producing/manufacturing the firm's offer and serving to the needs of the customers
	3) Growth, whose orientation is towards increasing sales
	4) Consolidation, which is distinguished by market expansion and scaling up.
	5) Maturity, no further explanation as is not relevant
	6) Reconfiguration, no further explanation as is not relevant
Mueller et al. (2012)	1) Startup, focus on identifying the business opportunity to capitalize, R&D, organizing a startup team, and fine-tuning products and services through customer interaction

	2) Growth, focus on sales, market expansion, financing growth, management accounting, enhancement of operational infrastructure, and networking

2.4. Review from the theoretical framework

To answer the research question, this literature review discusses theories and empirical studies in a few different fields.

To investigate how suitable the balanced scorecard is as a practice for tech startups, firstly the Balanced Scorecard (BSC) by Kaplan and Norton is presented. Thereafter many arguments are brought up, arguing for and against the suitability of implementing it in tech startups. Many authors promote the use of the BSC in small and medium sized enterprises (SMEs) but there are also a few challenges presented, such as the lack of resources and managerial expertise.

In order to research how tech startups should implement the BSC, the rest of the literature discuss a few different topics. It brings up critical success factors (CSFs), the issues that are important, in regards to tech startups, for building sustainable growth and success. These factors are for example managerial expertise, customer focus, human resources, venture capital and innovation. Furthermore, the literature discuss how companies are using the BSC but also what different authors recommend regarding BSC implementation.

Since the growth and development of tech startups are affecting their strategies, the literature also covers organizational growth. De Boer et al. (2001) state that a BSC has to be customized depending on the stage of development since different stages involve different strategies. Therefore, to be able to show how the BSC implementation should change over time, the literature review discusses models, which divide the organizational growth into different stages of development.

3. Methodology

This *section, the methodology behind this research is introduced. Reasoning behind the chosen methodological design is further elaborated.*

The aim of this study is to explore and develop a richer theoretical perspective regarding the use of the balanced scorecard among startups and therefore this study uses a qualitative research design. This method is chosen because of its aim to gain an in-depth understanding, engage with the researched subject and participate in the information exchange (Saunders et al., 2015). To explore but also get an overview, the authors perform a multiple case study, which examines several different startups individually and in their specific situation, but later conclusions from the whole sample are drawn (Yin, 1994). The authors believe that this is the best approach for this study due to the time constraints and the difficulties of gaining access to a high number of Swedish tech startups in a more quantitative study.

3.1. Research target and sample

The overall target group for this study is Swedish for-profit tech startups and according to Feinleib (2011) 80% of startups fails within the first three years. Since this study is supposed to contribute new insights to academia, but also to the business world, the authors find it important to study successful startups so the study can contribute with some sort of good practice methods. Together with the facts that tech startups in general are difficult to locate, the authors choose to address startups that had been selected and listed for their superior performance and business potential. The publications "Affärsvärlden" and "Ny Teknik" are every year publishing "33-listan" (Ny Teknik, 2016) which is described as "33 of Sweden's hottest tech startups" and are selected for having high potential, being maximum 7 years old and with a competitive advantage based on technology. The authors consider these companies as a good target group. All of the companies listed year 2012-2015, are emailed with a presentation of the study and an invitation to participate. Anonymity and other possible requirements are also offered. Some companies are listed several years and the total amount of startups is approx. 100, out of which 10 participate in this study. To make it more clear which participant the empirical findings come from, the startups are mentioned with company name in this study, instead of the interviewed person. In the following table, the reader can have an overview about the startups that are participating in this research:

Table 5: Interviewed startups

Startup sample		
Company name	**Sector**	**Interviewed person**
Schemagi AB	Consulting through software	Chairman & Interim CEO, Lena Lyckenvik
InfraSight Labs AB	Software and IT services	CEO & Co-founder. Magnus Andersson
SenzaGen AB	Biotech	CEO, Anki Malmborg-Hager
Mapillary	Web and mobile	CEO & Co-founder. Jan Erik Solem

Disruptive Materials	Chemistry	CEO, Mattias Karls
Climeon AB	Cleantech	CTO, Joachim Karthäuser
Heliospectra AB	Agrotech	COO, Chris Steele
OrganoClick AB	Chemistry	CEO, Mårten Hellberg
ChargeStorm AB	Cleantech	CEO, Patrik Lindergren
Min Doktor	Digital Healthcare	CMO, Carl Jansson

Apart from this, interviews are also held with 3 people that are regarded as business experts in the studied field and these consultants are invited to participate based on that they were found on the Internet while researching the industry. A few more people of this character were invited but declined participating. These are Erik Olin, Head of the TMT (technology, media and telecommunications) business area at Deloitte, Howard Riminton, Project Leader of The Nordic Tech List at Dagens Industri, and finally an Investment Manager from a Swedish venture capital firm that wishes to be anonymous. He is therefore referred to as Investment Manager.

The authors are aware of potential limitations of this sampling and despite that only successful startups participate, the outcome of the study is not exclusive for successful startups since it is not compared to unsuccessful ones. Since the authors only interview the companies that showed interest, the gathered empirical findings can also be biased (Saunders et al., 2015). The managers that participate in this study can be argued to have a special interest in this field both because they inhibit a lot of knowledge but also because they lack knowledge in this domain and this might result in extreme observations both in well implemented and in lack of implemented performance management.

3.2. The interviews

Since the research seek to discover first hand, how the studied startups work with performance measurements, the study uses an exploratory approach with semi-structured interviews. The interviews of the startups typically start with that the interviewer ask the interviewee to describe the company and the journey the company has gone through since its start. Then the interviewer directs the conversation to cover how performance measurement has been conducted through the life of the company. The interviewer asks open questions and let the respondents answer by explaining in their own words but the interviewer also has an interview guide, see appendix 2, that he can fall back on to ensure that all the desired information is gathered (Saunders et al., 2015). After all interviews are made, and presented as in the appendices, the authors email the participants so they can review the interviews confirm that the information is accurate.

Some of the interviews take place in the offices of the companies (Stockholm and Uppsala) but most are done over the phone (rest of the country) and they last 40-60 minutes. The empirical findings in the interviews are recorded or written down and soon after summarized in a form, see appendix 1. Since the authors did not in beforehand know how much time the participants would dedicate to the study, if they work with

performance measurement, how much interesting and relevant information they would have for the study, how much details they would share about their internal work processes etc., the authors conduct the two first interviews as a pilot for shaping the rest of the interviews. After these the authors create the form that the interviews are presented in, see appendix 1, so all interviews could be presented in a structured way.

There are potential limitations regarding the interviews as well since some of the interviews are conducted face to face in the offices of the companies and some over the phone. This might affect the depth and amount of information received from the participants since a face-to-face interview can be perceived as less stressful than a phone conversation. Furthermore, one author conducted some interviews in English, whilst the other conducted them in Swedish. However, all interviews produce a similar friendly atmosphere and gather the desired information. The authors also believe that the interviews in English do not involve an obstacle since the concerned business managers are practically fluent in English. To reduce the mentioned limitations, the authors discuss the interviews, during the period of conducting them, to share the experiences and shape an in common style of performing the interviews. This study is supposed to be conducted by two researchers and the authors believe that both should be involved in all processes to learn from the different steps of producing the study. However, together with the time constraints enforced by the respondents these discussed issues might impact the reliability/dependability of this study.

3.3. Analysis of the qualitative data

For the analysis of the qualitative data, a mainly thematic analysis is used since the essential purpose of this approach is to search for themes, or patterns, that occur across the series of interviews. Furthermore, this study uses an abductive approach for theory development, since the authors collect data to explore the use of performance measurement in tech startups, identify themes and explain patterns, to generate new or modify existing theory which is subsequently tested through additional data collection (Saunders et al., 2015).

To analyze what areas of performance that the tech startups are measuring the authors assign the objectives, critical success factors and measures from the startups to the balanced scorecard perspectives as described by Atkinson et al. (2012) and Kaplan and Norton (1996). However, this is a to some extent a matter of perception and there is a risk that other researchers would label these empirical findings to other perspectives of the balanced scorecard. To minimize this risk, the interviews are attached as appendices.

4. Empirical Findings

This section presents the empirical data that was collected through interviews with ten tech startups and three with industry experts. Based on the literature regarding the balanced scorecard perspectives and the organizational stages of development, this section will describe how tech startups seem to work around performance measurements and what challenges the startups might encounter to fully benefit from it.

According to Erik Olin, Head of the TMT (technology, media and telecommunications) business area at Deloitte Stockholm, it has to be considered that for many companies in the TMT industry, growth in itself is far more important than profitability during the first years. However, there must exist a balance between growth, profitability and control, otherwise the startup can face difficulties to survive. Howard Riminton (2016), Project Leader of The Nordic Tech List at Dagens Industri, exemplifies, "[...] a classic product example is SoundCloud, they got about 200 million users, but they have not got the revenue streams yet [...] so, their growth was based on the number of users, but for some reason they neglected the turnover [...] maybe now it is too late to create that revenue stream, as there are other strong players in the market such as Spotify and Apple".

4.1. Challenges for performance management in tech startups

Even though some tech startups use performance management to control their activities, the majority has three challenges to employ management controlling. According to Olin, the first challenge is their mentality, as tech founders are normally engineers that just want to sell and spend time on the market, instead of spending time internally to do the bookkeeping. Therefore, this lack of a comprehensive performance measurement system (PMS) is related to a priority issue during the early stages. According to Olin and the startups managers, the entrepreneurs simply believe that the resources are better spent on other issues, than in management control.

The second issue is a managerial competence problem. Olin, Riminton and several startup managers agree that many startups lack managerial expertise to understand and manage the benefits of performance management. However, among the interviewed startups, all that lacked managerial expertise before, acquired it during the commercialization stage and therefore they all currently have business managers with management backgrounds or/and with years of experience from similar working roles. Some of the startups, such as Infrasight Labs and Climeon, are run and developed by both a business manager and a lead technician responsible for the R&D.

The third issue is that entrepreneurs do not re-strategize from one stage to the other, and this is the result of the challenges one and two. Olin explains that the entrepreneurs do not formalize the business in the way they should, as friends that do not want to get bothered by the hassle of management controlling run the organization. Nevertheless, according to Olin and Riminton, management controlling becomes important to startups when 1) they take somebody else's money because they have to report the advancements/

shortcomings, and 2) they failed with a previous strategy, which forces them to re-strategize and monitor how their actions are affecting their short-term financial situation.

4.1.1. Overcoming the challenges

Riminton highlights that hard-to-measure indicators, such as customer lifetime value and cash conversion, are measurements that an accounting manager understands, but not a recently graduated tech entrepreneur. According to him, that is the gap between startups and mature-firms in regards of management accounting, "entrepreneurs do not need a guide for their long-term situation, but instead a few measurements that allow them to understand how their short-term situation is affected by their actions". Olin agrees with him that many startups would benefit from having a framework for performance management but it should be easy to understand and monitor. It should inform the managers about the impact of the current business activities but mainly in the short-term, instead of the long-term. Such a framework would also help the entrepreneur to fully understand their business in a more interlinked way, how the business could be improved over time and exactly how efficiently the startup is using its resources.

In addition, Riminton also believes that performance measurement would be valuable when reaching for venture capital, as the investors will be attracted to see that everything is in order and how the resources have been spent accordingly to the KPIs. Olin, Riminton and an Investment Manager who prefer to stay anonymous, agree that a framework, such as the balanced scorecard (BSC), could help explaining the value creation of a startup business model to potential investors, and therefore attract investment. However, the startups do not need several measures during the very early stage to succeed. Most of the startups in this study have been in contact and financed by investors, but only a few of the startups have encountered potential investors that demand to see several performance measurements.

4.2. Performance measurement in tech startups

All of the interviewed startups have chosen, based on their strategy and objectives, a few measures through which they assess their performance of their actions towards their business strategy. They use the measures to discover poor performance, analyze the reasons and rectify the underlying problems. However, the startups did not measure everything since the beginning and there is a clear trend that the amount of measurements increases as the firms grows. They emphasize the need of prioritizing and only focusing on the activities that drive the most value. For example, there is no need to spend a lot of resources, such as capital and time, in developing a complex performance measurement framework during their research and product development stage. Since their organizations are small, on average around 15 people, the startups are easy to overview, which makes them more focused on their operational activities instead of management control. They state that the importance of management control increases with growth due to the increased complexity of the organizations. Most of the indicators are assessed through quantitative measures but some more complicated aspects, such as employee

satisfaction and R&D, are assessed through more subjective and qualitative ways. The managers agree that they would measure those last two aspects in a more quantitative way if their organizations were much bigger and harder to overview. Most participants see correlations between the different measurements, which allow them to understand the cause effects relationships among the financial and non-financial indicators. For example, InfraSight Labs, Climeon and Organoclick take these causation/correlation effects into consideration when planning and working for building revenue.

Most of the managers have heard about the balanced scorecard. Schemagi and OrganoClick are the only ones that state they are fully implementing it. Others such as Disruptive Materials and Heliospectra state that they have taken inspiration from it, while structuring their performance measurements. In general, all of them measure something related to the BSC perspectives, but only a few have a very clear understanding about the perspectives and the amount of necessary measurements. All the startups as well as the industry experts (Olin, Riminton and the Investment Manager) think that the BSC is beneficial if the system strictly focuses on the objectives that are most important at the moment.

At this point, the managers emphasize that they are not looking for short-term results; they emphasize high results for the long-term perspective, such as the increase of the sales figures is directly proportionate with customer satisfaction. Disruptive Materials discuss that the measures that assess personal performance have to be well understood among the staff. There has to be a consensus that the measured issues drive success, so all the staff feels motivated to work according to what is measured. Finally, software startups such as Mapillary, InfraSight Labs and Min Doktor are able to easily gather quantitative data about the behavior and activity of their users; these insights are used for discovering bottlenecks and evaluating different features.

4.2.1. Performance measurement at the different stages of development

There is no real agreement between the participants on how to label the stages of development for a startup. However, the participants are able to describe their journey from the idea stage to their current organization. This process allows the identification of the activity patterns and shifts of focus related to their developmental stages. As an outcome, the first stage (Research & Product Development - R&D) can be described as the period of the initial research and the development of the first minimum viable product (MVP). The second stage (Commercialization) can be described as the moment when the startup start to commercialize its MVP, in order to monetize the efforts from the previous stage. And finally, last stage of the startups (Growth) is described as the moment when the company thrives to scale-up and achieve sustainable growth.

The following table shows how the tech startups measure their performance throughout three major stages of development. The table combines the 4 perspectives of the balanced scorecard with the previously mentioned stages. It shows the amount and percentage of startups measuring indicators in each perspective of the BSC. Even though that the table

is based upon the 10 interviewed startups, not all of them have been in all the stages. Therefore, the "Total startups in stage" are 7; 9; 6 respectively, instead of 10 for each stage. As an example, Mapillary is still in the R&D stage, and a few startups skipped stage 1 because they obtained developed products from universities, which move them directly to the Commercialization stage.

Table 6: Changes in measurements by the Startups between the stages of development

	Stage					
Perspective	**Research and Product Development (R&D)**		**Commercialization**		**Growth**	
Financial	0	0%	9	100%	6	100%
Objective	seek funding		Increase sales		Increase sales	
KPI			Sales		Sales	
Customer	4	57%	8	89%	6	100%
Objective	Asses market demands, build customer base		Build customer base		Increase Market share and expand to other markets	
KPI	usage, market activities		market activities, no. of customers		Market activities, customer satisfaction	
Internal Business Process	7	100%	9	100%	6	100%
Objective	R&D according to market demands		R&D, Build a business		R&D	
KPI	Product attributes such as price, quality, delivery time		Product attributes such as price, quality, delivery time		Product attributes such as price, quality, delivery time	
Learning & Growth	0	0%	1	11%	2	33%
Objective			Recruitment		Keep and attract staff	
KPI			Recruitment process		Staff satisfaction	
Total startups in stage	7		9		6	

It is important to highlight that the measurements from the startups are assigned to the BSC perspectives based on the authors' perception of the BSC perspectives explained by Kaplan and Norton (1996) and Atkinson et al. (2012). Reading the table, there is a clear trend that the startups at the R&D stage focus in the Internal Business Process and Customer perspectives. This derives from being focused on technological innovation based on customer demands. As the startups mature, they also start focusing on the financial perspective through sales and a few startups also measure a few issues in the Learning and Growth perspective, such as staff satisfaction. Overall, as the startups mature they expand their employment of BSC perspectives, objectives, measurements and degree of management control.

4.2.2. Stage 1 – Research and Product Development (R&D)

The first stage can be described as the period of the initial research and the development of the minimum viable product (MVP). The companies were formed either when the entrepreneurs started to conduct research, develop a MVP or when the entrepreneurs took control over a marketable product developed at a university. These startups normally receive seed funds from private or public actors in order to finance the cost of research and product development. Besides, startups such as Organoclick are capable to do partnerships or acquire monetary contracts with first customers.

A few companies such as Mapillary and OrganoClick began their sales process before their product was completely finished. Others have changed their initial product offering along the way of this stage to better fit the market segment (Climeon) and also to do it in order to gain income and knowledge from their potential clients and targeted market segment (InfraSight Labs). Interestingly, some startups such as Min Doktor and InfraSight Labs, agree that any minimum viable product (MVP) needs to be launched with high quality standards in order to not lose potential customers because of a flawed MVP.

Concerning the general objectives in this stage, the most common ones are related to R&D. It is of vital importance that the research and prototype development are based on customer or international standards, which reflects that technology development goes hand in hand with how to satisfy potential or early customers' needs. Therefore, the efforts of the startups are put on to solve technical challenges to turn the intangible research into a tangible product. The creation of a high quality MVP is a clear mission among the startups, as it represents less risks of losing early users, customers or venture capital. Other objectives are related to the generation of early revenues from either research outcomes or partnership contracts. Other science-based startups consider of vital importance, to seek for private or public funds to cover the cost of R&D. The startups believe that it is a critical success factor (CSF) to aim for early customer interaction. They prioritize to be in the market and attend conferences, tradeshows and summits in order to interact and identify potential customers and their quality standards. They strive to gain income and/or customer knowledge along the R&D stage. In addition, the acquisition of competent human capital to conduct successful R&D is an important factor.

The Investment Manager states that, if a startup is seeking for venture capital during this stage, they should be able to present a competent team and an idea with growth potential. Investors would like to see an identified problem and a great solution for it. It is also preferably to see an intellectual property (IP) barrier in order to protect the idea until the product gets to the market.

4.2.2.1. Stage 1: Performance measurement

It has to be strongly highlighted that most of the startups measure their performance regarding innovation in some way, but it is mainly how well their products meet the

quality standards or customer requirements, and not so much measuring the activities to reach the objectives. Tech startups seem to use qualitative, intuitive and subjective assessments for complicated issues such as R&D. The most common statement among the startups when asked about what they measure during their initial stage was "we were focused on measuring technical specifications". InfraSight Labs explain that since the innovation is unstructured with various tasks, it is too complicated to measure it in a quantitative way. For them, since only two people were working during the initial product development it is also a matter of wisely using the available resources such as capital and time. Some startups also have a customer focus and apply measures related to product attributes (price, quality, delivery time) and the outcomes of early customer relationships, which affects the way in how the customer perceives the company. For example, Climeon measured the attributes of their research and the number of attended conferences, which were connected to increase their brand image, prospect database, and decrease their cost of producing their technology. Most of the companies did not considered the financials as KPIs, however they were just aware of their finances to cover the expenses of research. Companies such as InfraSight Labs, Climeon and OrganoClick monitored capital raised by external investors or their sales revenues deriving from research, knowledge or early versions of products.

According to the Investment Manager, the most important indicators to measure are related to customers and product development during this stage. The startups can focus on these factors, by following the lean startup concept, as they will develop the product/service together with the customer, and gain income and market knowledge during this stage.

4.2.3. Stage 2 – Commercialization

Sooner or later, the startup builds a business around their minimum viable product (MVP) in order to monetize the initial research. During the test of the MVP, the startups are influenced by the feedbacks of potential or existing customers. Thus, to promote the commercialization, the startup had to develop a more customized or suitable product to their target customers.

The most common objectives among the startups are related to the monetization of the R&D efforts from stage 1. As the firm sees the need to shift from a R&D unit to a commercial business, there is a need to successfully re-strategize the startup in order to increase sales. Besides, startups will strive to receive constant customer feedbacks in order to improve their MVP.

All the startups had as a R&D aim to reduce the cost of production and improve their technology properties, in order to promote sales, reduce costs and thrive for future scalability. Other secondary objectives are related to build the corporate brand and generate positive word of mouth in the industry (Heliospectra), and organically grow without venture capital (Chargestorm). Therefore, the most important current CSFs among the startups seems to be recruiting people with management expertise to re-strategize and monetize the research efforts. Thus, involving sales, marketing and

customer service activities are considered as CSF. Additionally, setting an internal communication system within the organization to collect data from the interaction between customers and employees becomes important. Besides, increasing the startup network, in order to create partnerships or build relationships with customers, suppliers, and key actors of the industry, also becomes a CSF.

According to the Investment Manager, investors are really interested in the scalability factor, which is the possibility to grow without an extreme amount of investment. It is measured on "how much it cost to get a new customer" vs. "how much you can make from an acquired customer". Also, startups have to show how efficient they are with their resources. And finally, startups should create barriers to protect their idea or business, either by Intellectual property (IP) or partnerships with strong key players in the market, for example.

4.2.3.1. Stage 2: Performance measurement

As the startups shift to a more sales oriented organization, they measure their activities affecting their relationship with the early customers. Innovations and product improvements occurs continuously, but their idea is to shift focus and re-strategize according to their new development stage. Thus, the startups pass from being a research organization to a sales machine. Heliospectra, ChargeStrom, Organoclick and Climeon are clear examples about the importance of adding other competences, than research, to business in order to succeed in this stage. In regards of the financial perspective, the startups tend to carefully monitor their financials such as revenue and costs indicators from the organizational processes.

In regards of the internal process perspective, the startups not only measure the areas that provide value to the customers, but also the areas that provide financial value to the shareholders. Disruptive Materials measures their progress in terms of number of new patents, their, Intellectual property. Climeon and ChargeStorm measure production costs, production time, product quality and number of returned products. In regards of the customer perspective, all companies measure some aspects of their performance regarding meeting customer demands. InfraSight Labs and Min Doktor monitor the customer acquisition and retention, as well as the product experience to assess satisfaction and forecast future sales. SenzaGen measures sales and marketing activities such as the number of press releases, booked meetings and attended conferences. Disruptive Materials and Heliospectra measure the sales for different customer groups since they are very concerned with finding the right customer segments for their products. Whilst for the learning and growth perspective, its usage is not evident as only Disruptive Materials measures indicators related to staff recruitment.

4.2.4. Stage 3 – Growth

After the startups identify their right product and market fit, they will start to focus on scaling-up, enhancing their operational infrastructure and growing their businesses. It is

important to highlight that only six of the participants have reached this point. The most common primary objectives among the startups are related to achieving a sustainable business model. Their intention is to ensure profitability from now on; therefore, their objectives are to increase brand awareness, reduce technology production cost, enhance networking and key business relationships. Others objectives entail to increase market share, to expand to other markets, to become IPO ready, to scale up, to improve management controlling, and to enhance operational infrastructure to support the growth. Among the most important CSFs, the startups tend to mention high customer loyalty and customer satisfaction to produce word of mouth, continuous R&D around the most important clients, internally promote innovation towards internal activities and customer value proposition, breakdown responsibilities to all the teams, and finally monitor and control their performance.

According to the Investment Manager, if startups want to acquire venture capital to support their growth, they should be able to show relevant cash flow and have their financials in order. Startups should become IPO ready (company's readiness to become public), in case they do not have any other way to acquire more funds. Consequently, it requires from startups to have financial reporting procedures and internal controls, integrated strategic and business plans, budgeting and forecasting processes and monitoring. A firm should have sorted out their financial and legal perspective to go public in three months time, e.g. being capable to presents reports properly and count with a Chief Financial Officer.

4.2.4.1. Stage 3: Performance measurement

Only 6 out of the 10 startups have reached this development stage and the general trend is that the companies have increased their amount of measurements slightly from when they were structuring their business in the previous stage. The financial perspective becomes clearer to monitor and control and the learning and growth perspective starts to increase in importance. Schemagi and OrganoClick assess employee satisfaction and development through conversations and OrganoClick also do a co-worker study.

In regards of the internal process perspective, at least 4 out of the 6 companies are still focusing on innovation of their products. ChargeStorm, Heliospectra and Min Doktor are measuring technological data to be able to improve their products. OrganoClick measures the amount of innovative ideas that comes up and how many those are worth developing. They also measure their filed and approved patents. Schemagi measures the utilization capacity of their consultants, and how the customer satisfaction varies among their consultants. To highlight, Min Doktor pays critical attention to the customer lifetime value and the cost per customer acquisition; basically, they need to guarantee that the cost of obtaining one more customer is lower that the monetary value that the customer represents in the future – Those last metrics allow the startups to monitor their capabilities of future scalability.

In regards of the customer perspective, all the 6 businesses are still measuring some aspects of their performance regarding meeting customer demands or their

customer related activities. Climeon, OrganoClick, ChargeStorm and Schemagi measures number of customers, satisfaction, revenue per order/customer, revenue per customer, revenue per segment, value on leads and prospects, marketing efforts such as advertisement and the results of marketing efforts. Besides startup monitor their market share development; ChargeStorm and Min Doktor monitor if their existing customers are purchasing more from them. According to them, monitoring the sales activity of your existing individual customers is a good indicator for a good or poor customer value proposition.

4.3. What the startups do with the outcome of the measures

All companies state that they see an importance of creating awareness around the performance of the company and its different activities and for example Schemagi states that motivation among the staff is built in this way. The startups seem to have an open climate; with a flat hierarchical structure and that they work very transparently. Since they are working in very dynamic environments, many managers emphasize the importance of having a diverse workforce that can learn from each other and they regularly hold open meetings where information and ideas are shared freely. On these meetings, the staff get updates regarding the status and outcome of the performance measures and for example Infrasight Labs let all sales staff see each others result so they can learn and be motivated by each other.

Furthermore, it is important on these meetings to report the performance so the staff easily gets an overview. The startups use different reporting systems and for example Disruptive Materials describe that they use the traffic light reporting system. The startups do not use benchmarking so much because they believe that their companies are fairly unique at these early stages but for example Schemagi compares consultant utilization ratios with business standards. According to Min Doktor, it is hard for many startups do apply benchmarking since they do not measure much and there is not much available data to compare their own performance with.

The outcome of the measures is also used for creating incentives to some extent and in half of the responding companies do the outcome drive the salaries. For example, the staff at Disruptive Materials has salaries that are influenced of the measures around their specific tasks but also from the overall performance of the company.

5. Analysis

As discussed in the theoretical framework, the authors believe that the balanced scorecard seem to be a suitable practice for startups. To verify this thought, this section will analyze the empirical findings with the literature in order to discuss if tech startups could truly benefit from a balance scorecard, and if it does, how should it be implemented as the organization matures. The following analysis will lead the reader to a conclusive overview about this issue.

5.1. Suitability of the Balanced Scorecard for tech startups

The literature review shows many benefits of implementing the balanced scorecard, even for smaller companies (see table 1). For example, the BSC helps small and medium sized enterprises (SMEs) to have a longer perspective in their planning, in addition to supporting the innovation and strategy implementation needed for the firms to achieve their objectives (Gomes & Lírio, 2014). There are also many studies concluding that SMEs should increase their measuring of performance through the BSC (see table 2). Concerning the tech industry, Kremer (2013) concludes that high tech firms use the BSC to a higher extent than low tech firms, which is most likely due to a stronger focus on innovation and new markets penetration. With regards to startups, Tan and Smyrnios (2011) state that young successful fast growing SMEs (FGSMEs) use performance measurement in a similar way as the BSC. The mentioned studies conclude that an extensive use of the BSC is a "best practice" for high tech firms as well as FGSMEs, which is very relevant for this study.

This promoting stance of the BSC in the literature can be traced to some extent in the empirical findings. All the startups in this study are aware of the benefits of performance measurement and have implemented them in a similar manner as Anthony et al. (2014) and Atkinson et al. (2012) suggest. All the startups have chosen, based on their strategy and objectives, a few measures through which they assess their performance and if the measures indicate poor performance, the startups seek to analyze the reasons and rectify the underlying problems. All startups use measurements related to several of the four BSC perspectives, but almost none of the startups have a clear division of perspectives or a certain strategy around the amount of measures. The startups have a clear philosophy of only measuring the important indicators from the core activities of the business, so it does not become complicated to monitor, as Anthony et al. (2014) recommends. However, only two startups out of the 10 state that they actually use the BSC, which confirms Gumbus & Lussier (2006), that only a few small businesses are using the BSC. However, Olin and Riminton state that a framework such as the BSC would be very beneficial for startups to understand and manage their activities and see how different activities today drive progress in a month time. Since a startup do not really know where it will be in 3 years the startups need tools to see what is most critical to focus on in the foreseeable future (Olin, Riminton).

The BSC puts an emphasis on the non-financial drivers of a business for making strategic decisions (Kaplan & Norton, 2001) which Olin and Riminton emphasize is very important for startups in the tech industry since growth often is far more important than

profitability during the first years. For example, many web startups only measure their user base in the beginning to monitor this growth. However, the importance of profitability increases with time and there has to exist a balance between growth, profitability and control (Riminton) which Simons (2000) and Chapman (2005) state that the BSC facilitates. All participants in this study seem to agree with Löfsten (2015), that to truly benefit from the innovation, it has to be supported by business resources, such as business plans and analysis of the technology development.

Using the BSC can also be argued to be beneficial for startups seeking for venture capital. To attract investors, Sawyer (2009) states that an entrepreneur need to develop a detailed financial model to explain the success strategies that drive value out of the business proposition. Ries (2011) argues that performance measurement helps seeing which activities drive the value, thus it could be an argument for using the BSC. Olin, Riminton and the Investment Manager agree with the previous discussion, but the startups do not need a lot of performance measurement during the very early stage of their startups. Only a few of the startups have encountered potential investors with demands of a higher degree of performance measurement, but this could though be argued to derive from that all the startups in this study have already used performance measurement to some extent already from an early stage. Davila and Foster (2007) continue this discussion and state that a third party, such as a business partner or investor, sometimes require startups to implement more management control systems (MCSs) but according to Olin and Riminton this mostly reflects that the investor wants to see how his investment is performing and it is not an initial demand for making the investment.

5.1.1. Hinders and potential problems of BSC implementation in tech startups

As discussed, most literature promotes the use of the BSC in SMEs, but there are also a few authors discussing hinders for small companies to implement it.

One of these hinders, according to Rickards (2007), is that many SMEs lack managerial resources, knowledge, strategic thinking and other control systems to support the BSC. Davila & Foster (2007) explain that this derives from that many startups are founded by entrepreneurs that are not suitable to be managers for growing firms, switching focus from being a R&D unit to a for-profit business. Some entrepreneurs are more interested in the technical development of the product and the initial sales than managerial aspects such as management control (Chandler & Jansen, 1992; Willard et al., 1992; Davila & Foster, 2007). A few respondents who state that some entrepreneurs seek to avoid management control as long as possible recognize this phenomenon. Furthermore, to implement MCSs such as the BSC, the firm has to possess managerial expertise to some extent. Gregory and Sheahen (1991) state that many startups are founded by scientists and technicians that lack the managerial expertise needed when the firm changes focus from research to being a commercial business. According to Wright et al. (2007), this is a common problem regarding tech ventures that are spin-offs from the university, and this study includes several of them, e.g. Disruptive Materials and SenzaGen. Olin and several startup managers agree that many startups in general lack managerial expertise, but the

startups in this study have addressed this challenge. All the startups that lacked managerial expertise before, have acquired this during the commercialization stage, and therefore all startups currently have business managers with business degrees or/and with years of experience from similar working roles. Some startups, such as Infrasight Labs and Climeon, are run and developed by both a business manager and a lead technician responsible for the R&D. This corresponds well to March (1991) who stresses the importance of having a balance of competencies between exploration activities, such as R&D, and exploitation activities, such as commercialization.

A problem that also might derive from lack of managerial expertise is what Sousa, et al. (2006) state, that the cause and effect linkages between the non-financial and financial indicators in the BSC are not fully understood by most SME managers. This would hinder the beneficial learning that these linkages enable (Ries, 2011). Anthony et al. (2014) explain that these linkages should be understood in the organization, so there is a clear model on how different activities drive financial objectives. However, all the startups in this study, measure indicators from several of the BSC perspectives and all the managers seem to understand these linkages. For example, InfraSight Labs, Climeon and Organoclick take these causation/correlation effects into consideration and understand the link between innovation - competitive advantage - market activities - revenue, which the management uses to plan, foresee and build revenue.

Another hinder for implementing the BSC is, according to Rickards (2007), Szyszka (2003) and Lonbani et al. (2016), that many startups lack financial resources and Wright et al. (2007) point out that this is common among academic spin off firms. However, in this study no startup claims that the lack of capital limit their performance measurement or BSC implementation. According to Olin and the startups managers, the startups simply believe that the resources are better spent on other issues than management control in the early life of the organization.

There are also a few studies emphasizing negative aspects of implementing the BSC. In a study of Antonsen (2014), the employees are also torn between performing a good job according to themselves and according to what is measured in the BSC. In contrast, the measurements in the startups do not seem to result in this conflict and the managers emphasize that they are not looking for short-term results. For example, regarding sales, they emphasize high results in the long-term perspective and therefore it is crucial that both customer satisfaction and the sales figures are up to par. Disruptive Materials discuss that the measures that assess personal performance have to be well understood among the staff and there has to be a consensus that the measured issues drive success so all staff feel motivated to work according to what is measured.

Antonsen (2014) conclude that varied customer demands and complex work tasks make it difficult to use the BSC in practice, which is partly confirmed by the startup managers. Many startups use qualitative, intuitive and subjective assessments for complicated issues such as R&D and employee satisfaction, which Jarvis et al. (2000) state is common in SMEs. This goes against Atkinson et al. (2012), recommending the use of quantified

measures, but the managers state that they would measure these aspects in a more quantitative way if the organization were much bigger and harder to overview.

5.2. An adapted Balanced Scorecard approach for tech startups

Comparing the advantages and the problems regarding implementing the balanced scorecard in tech startups, the benefits can be argued to outweigh the potential problems, especially since many concerns in the literature do not appear to be issues in the startups. Therefore, it can be argued that the balanced scorecard should be implemented in Swedish tech startups.

It is important to highlight that startup managers and Olin only think that the BSC is beneficial if the system strictly focuses on the objectives that are most important at the moment. They emphasize the need of prioritizing and only focusing on the activities that drive the most value. For example, none of the startups use four measures in all four BSC perspective as Kaplan and Norton (1992) suggest, but that recommendation is arguably mostly directed to larger companies and the startups do not think all those measurements would be worth the effort. Since the small organizations of the startups are easy to overview, they prefer to focus on their operational activities instead of management control, just as Rickards (2007) states. This corresponds to Hudson et al. (2001) who state that many SMEs think the BSC is too resource demanding, and if the BSC should be truly be worth the effort, it has to be adapted to SMEs, so it easily adapts to fast changing strategies that are typical for SMEs. Therefore, the BSC has to be easy to manage and not overly complicated as Atkinson et al. (2012) emphasize.

Initially the use of performance measurement is low among the startups, but there is a clear trend that the amount of measurements is increasing with the growth and development of the startups. Several startup managers also state that an extensive BSC implementation is mostly for large and more complex companies, which can be argued to confirm Machado (2013), that the usage of the BSC is significantly lower in SMEs than in large companies. It can also support that strategic control is less developed in SMEs (Henschel, 2003) and that BSC systems are less formal and complex in small firms than in bigger corporations (Von Bergen & Benco, 2004).

The increase of balanced scorecard (BSC) implementation also holds true for management control in general and according to the startups the importance of management control increases with growth due to the increased complexity of the organization. This finding confirms the theories that the growth of startups and the adoption of MCS are occurring simultaneously and are reinforcing each other (Davila & Foster, 2007; Simons, 1995; Flamholtz & Randle, 2000). According to Davila & Foster (2007), management control systems are increasing rapidly during the first years of the firms, up to the point when the companies have approx. 50 employees, and after that the increase is slower. However, none of the startups in this study have reached 50 employees yet and it this can explain why the startups are still building up their management control practices.

Deriving from this discussion it can be argued that performance measurement should increase with the growth of the organization just as other aspects of management control. In the beginning of this section it was concluded that tech startups should implement the BSC and now it becomes obvious that the balanced scorecard should become more extensive along the growth of the startups. In the following section, the authors discuss how the balanced scorecard should be adapted for the startups throughout their growth stages.

5.3. The use of performance measurements through the stages, from a Balanced Scorecard (BSC) approach

Just as any company, the interviewed startups do not only grow in size, but also mature in their organizational structure. The tech startups adapt to the growing demands from their internal and external environment to move towards a new stage of development, which is supporting Greiner (1998) and Phelps et al. (2007) studies. However, there is no agreement among the managers, nor the scholars, about a growth model to explain the development stages of a tech startup throughout its early life. To segment the stages of the startup development in a cognitive manner, it was necessary to analyze the tech startup journey, which has been described by ten interviewed startups. This description also entails objectives and activities throughout their organizational growth. Thus, through the author's perception and the existing literature regarding growth models, it was possible to identify the major "revolutionary periods" or "tipping points", that Greiner (1998) and Phelps et al. (2007) stress. The identification of those periods, which are perceived as a reflection of the transition from the current to the next stage of development, allows researchers to build different growth models. Therefore, by using the same approach, one can segment the growth stages of a tech startup company, and label them as: 1) Research & Product Development, 2) Commercialization, and 3) Growth; in which the later stage can be perceived as transition from a startup to not-startup company.

In the following table, the authors have analyzed how the existing theory regarding organizational growth can be combined with the empirical growth model. Theoretical objectives have been assigned to each of the stages from the empirical findings.

Table 7: Relationship of the empirical growth model with the identified objectives from the literature review.

Relationship of the empirical growth model with the identified objectives from theoretical framework			
Author (year)	**Stage 1: Research and Product Development**	**Stage 2: Commercialization**	**Stage 3: Growth**
Moore (1994)	Research and prototype development	Constant interaction with customers and boost sales	Enhance the organization to support growth and achieve a sustainable business model
		Early enhancement of the organization infrastructure and competences to support future growth	

Xiao (2011)	Product/service development	Monetize the efforts from previous stage	Achieve a sustainable business model
	Validation of potential customers	Produce products/service for early customers	
		Satisfy the customer demand	
Stettner et al. (2014)	Identification of customer needs	Monetize efforts from last stage to support growth	Market expansion
	R&D according to customer needs	Produce products/services to satisfy customer needs	Scale up
Mueller et al. (2012)	Identify the business opportunity to capitalize	Monetize efforts from R&D	Market expansion
		Fine-tuning products and services through customer interaction	Financing growth
	Research and Development	Bring managerial expertise and other competences to run a business	Implement management accounting
		Enhance networking	Enhancement of operational infrastructure

Cuervo et al. (2007) and De Boer et al. (2001) discuss that as companies mature over time, and enter new stages of development, they have to change their focus and business strategies to meet the new encountered challenges. Consequently, the BSC has to change between the stages so it reflects the current objectives and the firm has to ensure that the resources are spent accordingly. The interviewed industry experts agree that a big challenge for tech startups is that they do not know how to change strategies as they mature and reach new stages of development. Therefore, this study, in the following sections discusses how performance measurement should change between the stages, from a Balanced Scorecard (BSC) perspective.

5.3.1. Stage 1: Research & Product Development (R&D)

Deriving from the empirical findings, this stage is described as the initial moment of research and the development of the minimum viable product (MVP). One can argue that the findings reflects Moore's (1994) "Conception and Development" stage on science-based startups, it also reflects Xiao's (2011) "Startup" stage, a combination of Stettner et al.'s (2014) "Background & Startup" stages, and finally it supports Mueller et al.'s (2012) "startup" stage.

Based on the authors' perception and the empirical findings, the main objective among the tech startups is to research and develop a technology based product according to the identified customers' demands. At this stage, tech startups do not prefer to focus on profitability and trading because their focus and resources are being employed towards R&D. The findings reflect similar objectives related to research, prototype development and product properties (Moore, 1994; Xiao, 2011; Stettner et al., 2014; Mueller et al., 2012), and validation of customer needs (Stettner et al., 2014; Mueller et al., 2012). Other

objectives such as generating early revenue streams and acquiring private or public funds are considered as an advantage and sometimes-necessary objectives to support the development of the organization. This emphasizes that a high amount of available capital at the early stage can produce sustainable effects that are positively related to growth, (Lasch et al., 2007). Therefore, one can argue that the startups should thrive to gain customer knowledge and income along the way of R&D. Organoclick is an example of the possibility of becoming profitable since the very start, as the founders seized the opportunity of signing contracts with early B2B customers who were willing to fund or pre-order a potential product before it is materialized.

According to the interviewed startups, the CSF to reach the main objective is the identification of potential customers and the proper interaction with them, in order to gain market knowledge during the initial R&D stage. This goes in line with literature stressing the importance of networking with industry actors to gain insights on how to succeed with them, (Tan & Smyrnios, 2011; Löfsten, 2015). Therefore, these empirical findings can defend networking benefits, such as R&D co-operation with other firms, as a CSF that promotes long-term survival, which Lasch et al. (2007) state is insignificant. In addition, the startups agree that acquiring competent people who can succeed in the R&D process and who can support the early monetization of the R&D efforts is considered as a CSF. This argues that startups must have different human capital skills to find balance between exploration activities such as R&D, and exploitation activities such as business partnerships since the early stages (Gregory & Sheahen, 1991; March, 1991; Barkham et al., 1995).

Finally, as some of the interviewed startups also focus in attracting venture capital, one can argue that they have to be able to explain how their business models creates value. According to the Investment Manager, venture capital firms are interested to see indicators related to the market such as customers, and indicators related to R&D such as technical specifications. In addition, from discussions with the startups and the Investment Manager, it is partially recommended that science-based startups create early intellectual property (IP) barriers in order to secure survival during the following early stages, (more about IP will be covered in the next stage). Besides, it is perceived as an advantage that the tech startup is capable of monetizing its initial research, as it will place their business in a better negotiation position in front of investors.

5.3.1.1. Performance measurement through the BSC in stage 1

Even though none of the participants employed the BSC during their first stage, they still used measurements in some way to monitor and improve their results. Through the eyes of the BSC and concerning its financial perspective, all the startups are aware of their financial situation, as it is not complicated to follow up with income and expenses. However, the tech startups do not consider the financial measurements as key performance indicators (KPIs) because they are not driven by sales or trading.

The internal business process perspective, on the contrary, plays a crucial role as most of the objectives and their performance measurements derive from innovation and

technological development. The startups measure how their value proposition is being developed and how it can satisfy potential customers. One can argue that the startups are driven by semi-long-term objectives, as they focus on the internal processes, such as manufacturing quality and cost, that will have the greatest impact on future customer satisfaction and future organizational financial objectives. Furthermore, measuring R&D seems to be a crucial activity for these fast growing startups at this stage. The findings highlight the importance of measuring the process of innovating products/services in order to promote fast growth in the tech startups, which supports Tan and Smyrnios (2011) who state FGSMEs tend to measure innovation and Sousa et al. (2006) who remark that regular SME do not. To exemplify most of the measurements in this perspective, one can see product specifications (e.g. international and customer quality standards), and production related indicators such as production time (eg. Shemagi, SenzaGen) and production costs (eg. Climeon).

Other identified measures are more related to the customer perspective. Over half of the startups have measurements regarding their customers in this first stage. This reflects the focus of developing products based on the results from early customer interaction and changing customer demands, which is stressed on the literature (Stone & Banks, 1997; Tan, 2007; Tan & Smyrnios, 2011). Therefore, one can strongly remark that all tech startups should not only concentrate in their internal capabilities, product performance and technology innovation, but also in identifying the right market segment to satisfy in order to deliver them the desired value; otherwise, the tech startup might be wasting its limited resources on the wrong market segment.

5.3.2. Stage 2: Commercialization

Deriving from the empirical findings, this stage is described as the period when the company is ready or in need to monetize the R&D efforts; thus the startup starts to build a business around its MVP in order to commercialize it. One can identify similarities with Moore's "Commercialization" stage (1994), Xiao's "Early" stage (2011), a combination of Stettner et al.'s "Startup" and "Growth" stages (2014) and Mueller et al.'s "startup" stage (2012). Therefore, one can argue that the "tipping point" is in the shift of orientation from a research unit to a commercial business, which demands the startup to possess new business competences and skills in order to re-strategize and succeed in this new stage.

Based on the authors' perception and the empirical findings, the two main objectives among the startups are 1) Monetize the R&D efforts, and 2) Constant improvement of the product/service with early customers. This can be supported by the identified objectives from the theoretical framework, which remark monetization of R&D, customer satisfaction and product fine-tuning through high customer interaction (Hanks et al., 1994; Moore, 1994; Xiao, 2011; Mueller et al., 2012; Stettner et al., 2014). One can argue that the more the tech startup matures, the more customer oriented it becomes. This is reflected during the test of the MVP, as all the tech startups are strongly influenced by the feedbacks of early customers, which generates more customized and suitable products/services for their targeted market segment. Additionally, other objectives lay in

improving efficiency process of manufacturing in order to reduce costs, and building & enhancing corporate branding in order to increase legitimacy and scale up. This goes in line with the theory as highlights the objective of early enhancement of the organization infrastructure (Löfsten (2015) and managerial competences to support future growth (Mueller et al., 2012).

According to the tech startups, the CSF to support the main objectives are around recruiting people with business competences and expertise to properly strategize and monetize the R&D efforts. Thus, one can argue that tech startups heavily depend on sales and business oriented individuals who can support the market learning process (Gregory & Sheahen, 1991; Tan & Smyrnios, 2011; Löfsten, 2015). This proves that innovation resources have to be supported by business resources in order to achieve positive development and long-term survival (Löfsten, 2015). Additionally, the enhancement of the industry network acts as a growth driver and is therefore another CSF to support the commercialization stage objectives. Thus, startups need the competences to build valuable relationships with customers, suppliers, and key actors of the industry.

It has been argued by the Investment Manager that in order to secure a competitive advantage, startups have to be capable of protecting their idea and business, through intellectual property (IP) or through key partnerships with key industry actors. Löfsten (2015) also promotes IP as a factor to protect competitive advantage and long-term survival for tech startups. However, one can argue against the remarks by the Investment Manager and Löfsten (2015) because in many cases the competitive advantage of a startup might be something else than just its patents, e.g. business network, brand, organizational flexibility or delivery time. Beside, one can also argue that even though an MVP is patentable, it might not be worth to spend the startup limited resources such as capital and time in something that might be replaced soon because of their fast technological advancements; thus, a tech startup should consider that a patent becomes very valuable when their product will be successful enough to justify the legal expenses and resources to defend the patent.

Finally, it has been remarked that venture capital-backed organizations might grow much faster because of the acquisition of external managerial and financial resources, (Davila & Foster, 2007). However, one can find some arguments in favor and against from the empirical results. Apart from the financial benefits, some of the startups are greatly benefited from the venture capital firm because of the improvement of the startup legitimacy in the market place. Whilst others do not need venture capital in order to perform well (e.g. Chargestorm), and therefore prefer to avoid venture capital in order to not lose equity and control over their organization. This bring to the light that managerial resources do not necessarily have to come from the venture capital side in order to succeed, but the startup can truly benefit its growth by the increase of legitimacy that can be obtained by the branding of the venture capital firm.

5.3.2.1. Performance measurement through the BSC in stage 2

Even though only a few startups mentioned to be influenced by the BSC to monitor their performance, all of them stated to be measuring at least a couple of KPIs to monitor and improve their performance towards the strategic objectives. As the startup grows overtime, their organization becomes more complex to handle, therefore they identify the need to measure more indicators than in stage 1. Thus, as the new objective is to monetize the efforts from the previous stage, almost all of the startups use measurements regarding the customer, internal and financial perspective

Through the eyes of the BSC and concerning its financial perspective, the tech startups are taking it more seriously. All the startups that have passed through this stage have started to measure KPIs related on how to look in front of the shareholders. Every other non-financial measure that is selected in the other perspectives is part of a cause-effect relationship that culminates in improving their financial performance. This supports Kaplan and Norton (1996) as they state that the financial themes of increasing revenues, improving cost and productivity can provide the necessary linkages across all the four perspectives of the BSC. Some of the measures mentioned by the startups are revenue stream and manufacturing costs.

As the tech startups shift their focus to a more sales oriented organization, they see the need to urgently identify their ideal customers and market segment in which to compete. Thus, the tech startups start to assign customer-outcome-measures, such as acquisition, satisfaction, retention and profitability, to the targeted customers and market segment. All the companies tend to look carefully at the customer product experience in order to improve their products/services and forecast future sales. Therefore, sales, marketing and networking activities are turned into indicators to monitor this perspective. One can agree that the startups are right in increasing their KPIs around the customer perspective, as the identified segments represent the revenue component of the startups financial objectives. These finding supports Lasch et al. (2007) and Tan & Smyrnios (2011) studies about the importance for FGSMEs of being more customer focused in order to increase their sales.

Finally, the internal business process perspective is now strongly connected to the customer and financial perspective. Now, startup managers not only identify what processes are more critical for achieving customer objectives, but also for the shareholders' objectives. Thus, startup managers develop their internal process objectives after formulating the objectives and measures for the financial and customer perspective. Therefore, one can stress that this perspective will allow tech startup managers to focus and monitor the metrics that will deliver those objectives to the established customers and shareholders. The startups tend to measure how their internal work has an influence on the commercial capacity of the organization, such as innovation, operation and post sales procedures, which supports Kaplan and Norton (1996) findings.

5.3.3. Stage 3: Growth

Deriving from the empirical findings, this last stage is described as the moment when the firm finds a product or market fit and begins to scale-up. The findings support D' Augell concept about the last stage as a startup (Hall, 2011). One can also argument that this proposed stage is supporting Stettner et al. (2014) "Growth" stage and Hanks *et al. (*1993) "expansion" stage, as it represents the expansion of the market share, and a strong focus for a commercial business model. This can also be related to Mueller et al. (2012) "growth" stage, as it represents a prioritization of the entrepreneurs focus towards sales and management accounting. One can argue that this stage is a transition from a nimble startup to a more organized and established tech company. By this stage, management accounting becomes a must and a critical practice for the interviewed startups to manage and continuously improve their performance and customer value proposition, which supports Hanks and Chandler (1994) and proves wrong Lasch et al. (2007). Therefore, one can argue that tech startups become more concerned about finding a balance between profitability, growth and control, which supports the perception of the industry experts (Olin, Riminton and the Investment Manager).

Consequently, based on the authors' perception and the empirical findings, the main four objectives among the startups are 1) Increase market share and expand to potential markets, 2) Improve management controlling and especially performance management, 3) Scale up, and 4) Balance profitability, growth and control. One can relate these objectives with the theory that sets the firm's focus on achieving a sustainable business model (Gregory & Sheahen, 1991; Moore, 1994; Mueller et al., 2012; Stettner et al., 2014). Other secondary objectives fall into ensuring improvements in the organizational infrastructure to conduct research, manufacture and commercialize efficiently and without internal barriers, which supports Löfsten (2015).

According to the startups, some of the CSFs to achieve the main objectives are around high customer loyalty and word of mouth because startups want to enhance their branding and legitimacy. Besides, another CSF is to develop products around the most important customers, but without neglecting other market segments in order to not lose potential business opportunities. Furthermore, innovation becomes a more crucial CSF to not only improve customers' satisfaction, but also to improve internal working processes. Thus, one can argue that management controlling becomes a crucial practice to delegate responsibilities and monitor individual or team performance in order to ensure that tech startups achieve their more complex objectives. In addition, the startups seem to need a good industrial network, strong managerial competences and legitimacy to be able to prosper and grow fast, therefore, one solution might be to involve an investor who can provide these competitive advantages to the firm.

Finally, one can identify the importance for tech startups in becoming IPO ready. It was discussed with the Investment Manager that sometimes startup might run out of capital to support a potential growth. Therefore, in order to not lose the good momentum, a startup must be ready to go public, in three months time, in case there is no other way to acquire capital to support the forthcoming growth. However, that step would require from startup

managers to have their organization under control in both short and long-term. Thus, one can highlight the importance of properly working with the four perspectives of the BSC in order to monitor and control the impact of the tech startups non-financial measures towards their financial KPIs.

5.3.3.1. Performance management through the BSC in stage 3

In comparison with the two last stages, performance management is now a more complex process. The learning and growth perspective start to become more noticeable. Startups seem to be more concerned about investing resources to create long-term growth and organizational improvements. Startups such as Shemagi and Organoclick measure indicators regarding employee recruiting and satisfaction; this reflects that the startups managers see their human capital as one of their most valuable assets to protect. In fact, almost all the startups state that they put a high value on their employees and offer them stock options in order to decrease turnover, increase the staff motivation and their performance. This might confirm that startup managers aim to provide flexible working environments and career opportunities as a way to reduce churn (Tan & Smyrnios, 2011; Nicholls & Nixon, 2005; Tan, 2007). Even though only three startups seem to monitor KPIs around this learning and growth perspective, one can strongly stress that tech startup at this stage have to invest for the future. Normally, the areas in which the tech startups seem to invest are in operational infrastructure such as R&D, however they should also invest in their talent capabilities, ICT capabilities and organizational climate for employee motivation, in order to achieve long-term financial growth objectives.

Thus, the other three perspectives (financial, internal and customer), that identify where the organization must excel in order to achieve great performance, are now supported by the objectives in the learning and growth perspective. Tech startups taking into consideration this perspective are aiming to provide the infrastructure and environment to their organizations that will enable the consecution of excellent outcomes from the other three perspectives.

5.4. Using performance measurement to increase learning and motivation

A few companies such as InfraSight Labs and Mapillary have begun their sales process before their product is completely finished and InfraSight Labs have changed their product offering along the product development, from information to computer software. InfraSight Labs have done this to receive an early income but also to learn from their customers. Ries (2011) discuss that a startup should successfully grow through a cycle of "building - measuring - learning" and therefore develop a "Minimum viable product" (MVP) as early as possible to start that desired learning, through customer feedback. However, InfraSight Labs do not agree completely with this reasoning since their company, as well as many others, target specific business-to-business customers and there are usually not an unlimited amount of them. If the startup happens to offer a flawed product, the startup risk losing many potential customers since they do not have

much patience with suppliers of flawed products. Therefore, this “Minimum viable product” has to be a decent product before it is launched.

Also concerning learning, for example Disruptive Materials and Climeon measures the sales for different customer groups since they are very concerned with finding the right customer segments for their products. This is also recommended by Ries (2011) since it helps the firm to learn how different segments respond to the product and which are the most profitable.

The software startups such as Mapillary, InfraSight Labs and Min Doktor can benefit of a special form of learning. Since their products are digital, they can gather quantitative data about the behavior and activity of their users, which can be used for discovering bottlenecks and evaluating different features. The mentioned startups confirm McIntyre’s (2011) recommendation and do this to a high extent, in order to learn and improve their strategic decision-making.

All the startups describe that they are working in very dynamic environments and many managers emphasize the importance of having a diverse workforce that can learn from each other. The startups state that they to work very transparently, holding open meetings where information and ideas are shared freely. On these meetings, the staff get updates regarding the status and outcome of the performance measures and for example Infrasight Labs let all sales staff see each other’s result so they can learn and be motivated by each other. This transparency is also recommended by Lonbani et al. (2016), Tan and Smyrnios (2011), who state that regular face-to-face meetings for sharing information in FGSMEs, reduce organizational uncertainty. Lonbani, et al. (2016) also emphasize the importance of, especially in unpredictable markets, that the staff is encouraged to come up with suggestions for accomplishing the balanced scorecard objectives and the gathered experience is that most of the startups are promoting this through their open atmosphere and regular meetings. Furthermore, all startups discuss the importance of reporting the performance regularly so the staff easily get an overview of the progress and feel motivated by it. The startups use different reporting systems and Disruptive Materials is the only startup stating that they use the traffic light reporting system which Gumbus and Lussier (2006) state that many firms use.

Anthony et al. (2014) and Paladino (2011) recommend benchmarking of the balanced scorecard measures but the startups do not use this method much because they believe that their companies are fairly unique at these early stages. This is coherent with previous studies which state that most micro firms, small firms (Australian Bureau of Statistics, 1997) and FGSMEs do not measure performance in relation to their competitors, but instead set their own standards (Tan & Smyrnios, 2011). It could be argued that many tech startups have a unique product and that some strategies are fairly firm specific, which decreases the suitability of comparisons to other companies. Min Doktor also mentions the difficulties of finding data to compare the performance with. However, it could be argued that the startups should consider this method in some areas, which could be comparable with similar companies. For example, marketing and sales activity could be measured in comparison to other companies of similar size or strategy.

About half of the responding startups are using the measurements as bases for compensation programs which confirms the findings of Gumbus and Lussier (2006), that state that many companies that have used the BSC for a while are applying it to compensation and employee performance appraisal. However, this usage should be higher according to Speckbacher et al. (2003), Malmi (2001) and Paladino (2011) who state that the BCS should be linked to rewards, incentives and compensation programs, to align organizational and individual goals.

6. Discussion & Conclusion

As previously discussed, literature regarding the implementation of the balanced scorecard in startup companies is scarce, and there is no similar multiple case study as this thesis. Reason why researchers such as Tan and Smyrnios (2011) encourage further research about how fast growing small and medium sized companies, at different stages of their organizational development, use performance measurements. This study address this gap in the literature with empirical findings from 10 startups in the tech sector, and provides further insights regarding the suitability of implementing the balanced scorecard in tech startup companies. Therefore, this thesis makes an academic contribution through the following points:

6.1. Suitability of the Balanced Scorecard for tech startups

In regards of the main research question, "How suitable is the balanced scorecard as a practice for for-profit tech startups?" this thesis especially contributes to the literature that the balanced scorecard can be a suitable managerial practice for early stage tech startups. The authors of this thesis conclude that startups managers need to be able to translate their strategy into concrete financial and non-financial measures, in order to be able to execute the desired strategy successfully. Tech startups truly benefit from efficiently communicating their targets, assigning responsibilities to individuals and departments, and monitoring the critical activities in which their strategies depends on. Additionally, the process of measuring of performance management allows startup managers and their staff to focus on the critical success drivers, which allows them to align their actions and limited resources towards the strategic goals. Furthermore, the balanced scorecard addresses the need of the tech startups to create a shared understanding of the organization's vision and how each of the employees contribute to the organizational success. Finally, the BSC supports startup managers to understand their business in a more interlinked way, which allow them to successfully communicate with investors about their business model and how their organization is under control; thus, increasing their likelihood of acquiring venture capital for when it is needed.

Nevertheless, it is essential that the implementation of the balanced scorecard is adapted to the current stage of development of the startup because strategic objectives change according to their current needs. This thesis proves that there is a trend to increase

performance measurements as the startup matures. Additionally, due to the startups resource constraints, it is crucial that the Balanced Scorecard only focuses on monitoring the success drivers from their initial stage, and then gradually increases measurements to monitor more complex strategic objectives.

6.2. BSC's perspectives through the stages of tech startups

In order to answer the sub question of the research question, "how should tech startups implement the Balanced Scorecard?", one must understand that one way to assess the performance of a startup is by looking at its current stage and the required steps for further development. Therefore, the BSC has to be customized to the current startup needs in order to benefit from it. So, in order to customize it, an important factor to consider is the maturity level of the organization. Due to that the BSC translates the startup strategy into concrete objectives, the startup manager must restructure the BSC according to the objectives of their current stage of development to be able to assess their performance. The central issue around the BSC is to identify what are the areas in which the startup has to excel in order to achieve its current strategic objectives. Therefore, based on the empirical findings and the existing literature, the authors of this thesis propose a model to segment the startups development stages in three major ones. The first stage is "Research and Product Development", followed by the "Commercialization" stage, and finally "Growth". This last stage can also be perceived as a transition from a nimble organization to a more organized and regular tech company. Thus, it could be expected that the tech startup is capable to find balance between profitability, growth and control by then.

Consequently, the previously mentioned model allows the customization of the BSC. Using the proposed growth stage model, and the BSC framework developed by Kaplan and Norton (1996), the following model reflects the likelihood of usage of each perspective throughout the three stages of the BSC. Through a grey scale, the authors have visualized the importance or likelihood of considering the perspective in order to succeed in the stage. The white cells are not proven to be significant towards the success of the tech startup, the light grey is proven to be significant to some extent, and the dark grey is proven to be highly significant towards the achievement of the business strategy.

Table 8: Trends in the Balanced Scorecard implementation for tech startups throughout their stages of development

Identified trends of performance measurements throughout the startup stages of development				
Balanced Scorecard		**Stages**		
BSC perspectives		**Research and Product Development**	**Commercialization**	**Growth**
Financial	*Objective*	Seek funding	Monetize R&D efforts	Sustainable business model, scale-up
	KPI	No identified KPIs	Operational revenues, costs	Profitability, ROI

Customer	*Objective*	Assess market demands, build customer base	High interaction with the market segment	Increase Market share and expand to other markets
	KPI	Product experience, market activities	Customer outcome measures and market activities	Market activities, customer satisfaction
Internal Business Process	*Objective*	R&D according to market demands	Enhance critical processes for achieving customer & shareholders objectives	Prepare the organizational infrastructure for the upcoming growth
	KPI	Product attributes such as price, quality, delivery time	Commercial capacity and internal work processes	Efficiency of the organizational operations
Learning & Growth	*Objective*		Recruitment	Keep & attract competent talent
	KPI		Recruitment process	Staff satisfaction, career development

Therefore, from the visualization, one can notice that performance measurements increase in importance as the tech startup matures overtime. One can see that during the R&D stage, startups are strongly driven by the objectives from the internal business process, and influenced to some extent by the customer perspective. Followed by the commercialization stage when the customer and internal perspective become the drivers to generate a good performance on the financial perspective. Finally, the growth stage reflects the aim of the startup to build a sustainable business that performs well in the short term and aims to perform well in the long-term.

6.3. Using performance measurement to increase learning and motivation

Learning is essential for a startup, and the whole concept of performance measurement is based on the fact that the organization should grow through learning processes. Therefore, startups should enable the learning as soon as possible by finding out market demands and how to gain customers. For example, when your minimum viable product is available for testing, start measuring and quantifying your business since the very beginning. This can be made through starting the sales process already in the initial stage to gain that market knowledge. However, it is essential that these early products are not flawed or inferior the competition, otherwise there is a risk that the startup will receive negative attitudes from the future potential customers. It is also important to distinguish different market segments and to measure which segments are the most profitable in order to put effort there. If the startups can monitor the customer usage of their product through an online digital platform, they should measure as much as they can to learn about customer behavior and the most important issues to improve. Since the startups are agents of innovation in unchartered fields, it also very important to empower the learning process within the organization. Startups should promote having a diverse workforce, have a transparent corporate culture and hold open meetings where ideas and information is shared freely. They should also update the staff regularly about the outcome of the performance measures to increase staff motivation. These updates should be presented so all staff easily get an overview (the traffic light reporting system is a good practice). To

further motivate the staff and align personal goals with the ones of the firm it is recommended to link the performance measures to compensation programs.

Unfortunately, most of the startups do not use benchmarking yet because they feel that their business cannot be compared with others, or because they have not gathered enough data about their performance. However, one can argue that even though tech startups cannot benchmark their measurements because it has never been done before in a specific startup field, one still can measure and compare their stats periodically, just so verify if something changes or needs to be adjusted. Besides, startup managers should consider benchmarking some of their operational areas, which could be comparable with similar companies. For example, marketing and sales activities could be measured in comparison to other companies of similar size or strategy.

6.4. Managerial implications

The findings of this study can be used as recommendations for startup managers, especially in the technology industry. The conclusion presents a tool that can be used as a guide for setting and implementing the balanced scorecard throughout the startup development, but naturally the use has to be carefully adapted to the specific firm strategies. Furthermore, the conclusion presents recommendations on how these startups should work around the balanced scorecard.

Additionally, the model provides an excellent instrument to generate insights into what organizational aspects need to be taken into consideration throughout specific stages of development. Also, it will allow tech entrepreneurs to understand their business in a more interlinked way and how their short-term performance is affected by their current activities. Finally, tech entrepreneurs will be able to understand what balance is required in the organizational activities in order to stimulate development and move from a nimble startup to a sustainable business.

6.5. Limitations of the study

All of the startups in this study have won awards for their high potential. They seem to be using performance measurement to some extent and in similar ways as the literature recommend. However, since this study only includes ten successful startups, and there is no comparison with less successful startups, the authors cannot generalize that performance measurement is beneficial for all tech startups. Furthermore, the fact that the sample shows an extensive use of performance measurements can be related to the fact that only managers who see the value of measuring wanted to participate in this study.

Another limitation is that a sample of ten startups coming from different sub sectors such as cleantech, agrotech, chemistry and software based does not provide strong arguments to generalize results for the entire tech sector, nor each subsectors.

6.6. Discussion of the results in a wider context

Despite that this study cannot provide evidence that performance measurement is increasing business performance, the literature and the empirical findings are coherent that Swedish tech startups should use a performance measurement system, such as the Balanced Scorecard, to monitor and improve their performance. This is believed to be of increasing importance for fast growing companies with high scalability, as they have the most to benefit from this control and strategic tool. The results from this study are based on the tech industry, but these companies are dealing with very varying products/services. Therefore, the recommendation to implement the Balanced Scorecard can be appropriate for a much wider field of industries. There are no reasons to think that the findings only reflect the specifically Swedish tech startups, as these findings can also be set in an international context. According to Olin, Riminton and Disruptive Materials, even though American tech startups often have a different mindset than Swedish ones, the benefits and structure of a performance management system should be the same. Olin, Riminton and Disruptive Materials state that American tech startups often grow much faster than Swedish counterparts so the Balanced Scorecard could be even more beneficial for them.

7. Suggestions for further research

Gumbus and Lussier (2006) emphasize the need of future studies that are quantitative to analyze the use of the balanced scorecard in small entrepreneurial companies, especially in the service sector. As this study only includes ten startups, the authors encourage further research to examine the use of the balanced scorecard and performance measurement in a higher quantity of startups. For these future studies, it would be interesting to include startups from various industries and of various growth rates, to compare their implementation of performance measurement and present further trends.

It would also be interesting to see more studies about benchmarking the performance of tech startups, such as the Technology Fast50 from Deloitte, but with more non-financial indicators. It would be interesting to see a benchmark that not only compares the growth in revenue, but it shows what are the most important success drivers and best practices of top performing tech startups.

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Appendix #1

This appendix contains the gathered primary data from the interviewed startup companies.

Company name: Schemagi AB.

Interviewed person and date: Chairman & Interim CEO, Lena Lyckenvik, 9 March 2016
Sector: Consulting through software
Business overview: Sell consulting services for staff scheduling. Own a technical platform for optimizing scheduling for staffing
Initial idea/background: The software algorithms and early stage technical platform was developed at Linköping University
Y**ear active:** 2010

Stage 1 - Research stage: Focus: Building the technical platform and sellable product

Stage 2 - Commercialization stage: Focus: Sales and building scalability through the technology.
Objective in stage 2: Innovation: Technical development of the product so the process of creating a schedule demanded less man hours
Customer: satisfaction
Sales through prescriptions of the software
KPIs in stage 2: General financial measures- revenues and costs
Sales: Nr of customers/prescriptions
Production/Innovation: production time for a schedule

Stage 3 - Growing stage: Restructuring to consulting business, making the company profitable.
Objective in stage 3: Customers could not use a schedule that was objectively calculated to be optimal, since there were various personal issues among the staff that had to be considered. Therefore Schemagi was restructured to a consulting business and the software only used as a tool, and not as the marketed product. There are no efforts to develop the software at this stage but there would further developments if it could directly increase business.
KPIs in stage 3
General financial measures- revenues and costs
Sales: capacity utilization of consultants, nr of sold consulting hours, billings per hour
Customers: nr of customers, satisfaction, revenue per order/customer, revenue per customer segment, value on leads and prospects, marketing efforts such as advertisement, results of marketing efforts
Employees: satisfaction and development is assessed through qualitative conversations, the customer satisfaction among the consultants is compared,

Cause-effect relationships: Marketing such as advertising creates business since all business comes from customers contacting Shemagi and this in turn creates revenue.

Comments about measuring: The framework of the balanced scorecard is used for determining objectives and the measurements for assessing the performance in the different perspectives.
Reports / Follow ups: Sales and Market related measures are reviewed weekly
Managerial background: CEO has managerial expertise from several corporations
Stage in which the management expertise came: from start
Current number staff in total: 10
Staff awareness about measures: Yes, all staff are updated about the performance and motivation is build upon that all staff feel part of the activities and performance
Measure based incentives/salaries: The staff has fixed pay that is not dependent on the measures
Anything special regarding measurements that investors wanted to see: The investors wanted to see business potential but nothing special regarding the internal measures.

Company name: InfraSight Labs AB

Interview person and date: CEO & Co-founder. Magnus Andersson, 4 March 2016
Sector: Software and IT services
Business overview: Develop and sell a computer software which is a tool for mapping, documentation and analysis of IT infrastructure
Initial idea/background: Started as an idea at IBM where one co-founder worked previously
Year active: 2010

Stage 1 - Research stage: Focus: Technology and product
Objective in stage 1: Innovation: Technical development of the product according to potential customer demands,
Sales: Strive to always have something to sell to gain income along the development. They sold information, code and later early versions of the product
KPIs in stage 1: Innovation: Measured in a qualitative way through intuition
Why lack of more KPIs: Since the innovation is unstructured with various tasks there is to troublesome to measure it in a quantitative way. They were only 2 people working in the company

Stage 2 - Commercialization stage: Focus: Sales and building a business
Objective in stage 2: Innovation: Technical development of the product
Growth: Increase sales through building the company with recruitment of staff and a competent board of directors
KPIs in stage 2: Innovation: Measured in a qualitative way through intuition
Financial: Turnover, revenue per customer etc
Sales: Nr of sales calls, nr of demos, nr of trials, nr of sales. One reason to measure the sales activity is to asses the cost of sales for planning for expansion and potential financing for that expansion
Customer: Nr of customers

Usage: Measure and track user behaviour. How and how much customers use the software. If customers do not use the product they might cancel prescription

Cause-effect relationships: Innovation - Sales activity - sales - revenue
Do measure outcome impact strategies & work process: Very transparent with the measurements. Only measure to improve, asses the progress and plan for the future demands and potential. Measure the salesmen for comparing and for learning of each other
Managerial background: CEO has managerial degree and managerial expertise from large corporations
Stage in which the management expertise came: From start
Current number staff in total: 10
Staff awareness about measures: Yes, very transparent
Measure based incentives/salaries: Yes, the salesmen have performance based salaries
Year in which the company makes profit
thoughts about future
Anything special regarding measurements that investors wanted to see: Not about this company but have seen many cases of struggle between angel investors and startups. Often investors know less about the business than the entrepreneurs. Many entrepreneurs feel obliged to report information and measures that do not add value to company and strategy
Advice to other startups: Think startups are sold to fast to USA and get to much external investors, Swedish startups need to sell their own product
Further comments: Dont agree with Ries since you cant test mvp on B2B customers bcs you dont get many and they will desert you if your product sucks, no second chances

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Company name: SenzaGen AB

Interview person and date: CEO, Anki Malmborg-Hager, 23 Feb 2016
Sector: Biotech
Business overview: Sell the testing of chemicals at their own laboratory. Owns the IP rights to specific test methods which test the potential for chemicals to cause allergic reaction on human skin. These methods have the highest accuracy in the world for this field.
Initial idea/background: Research at Lund University since 2005, Registered company and patents year 2010.
Year active: 2014: Oct

Stage 2 - Commercialization stage: Focus: Building the business and sales
Objective in stage 2: Build the company in all areas: Developing business strategy, take it out of the university, finance it, hire staff, create sales and production. Primary objective was to grow organically without outside investment but after received a lot of attention they changed strategy to grow faster. They raised money from private investors and the objective is for Initial Public Offering late 2017
CSF in stage 2:

KPIs in stage 2: Sales: nr of tests
Marketing: nr of press releases, meetings and conferences attended. The press releases communicate innovation, growth and commercial progress for the company
Measure but no focus on: visitors on web page, press releases opened
Production: time for different testings for better pricing

Comments about measuring: Have worked with balanced scorecard before but it feels to strict and unnecessary for this company and on this small level. Only measures that can improve the business
Reports / Follow ups: Monthly financial and sales reports to board and owners. Weekly meetings for staff where for example performance is discussed
Managerial background: CEO has managerial experience from various corporations
Stage in which the management expertise came:
Current number staff in total: 14
Staff awareness about measures: yes, weekly meetings, especially sales
Measure based incentives/salaries: Year 2017 there will probably be an incentive system for all on the board dependant on their responsibility areas. For example: Lab manager will be measured through KPIs regarding optimization of the lab, such as decreasing costs and lab time for analysis.
Year in which the company makes profit: profitable 2014, neg 2015 bcs investment and recruitment, plan profitable 2017
Thoughts about future:
Anything special regarding measurements that investors wanted to see: Investors don't have many demands but they want to see sales figures
Advice to other startups: Many startups come from university and need a more business and sales focus. Diversity is necessary, old and young and different competencies
Further comments:

Company name: Mapillary

Interview person and date: CEO & Co-founder. Jan Erik Solem, 18 Feb 2016
Sector: Web and mobile
Business overview: Mapillary builds a streetview solution where the users can upload pictures from any source, in reality mostly phone cameras, tag them to the specific location and in that way and map the world. Corporate customers can use this information for a fee.
Initial idea/background: Idea had been in mind for a few years. The company started when the prerequisites had been realised, with other words now the IT systems are advanced, most people has a smart phone with a good camera, crowdsourcing is an accepted and common phenomenon
Year active: 2014: Feb

Stage 1 - Research stage: Focus: Development and building database
Objective in stage 1: Innovation: Technical development of the system

Process/Usage: growth of the builder base
Customers: increase the numbers of paying customers using their data and service.
CSFs in stage 1: Customers: Important with qualitative feedback from customers. Emails and conversations and can be regarding features the customers want or technical solutions that don't work
KPIs in stage 1: Innovation: Is measured qualitatively, target is 2 solid features every month
No point in measuring more regarding innovation since there is no set goal for their R&D. Every week new plans are made for coming activities and the foresight is not longer than a few weeks
Process/Usage: 1- Number of pictures uploaded, 2- Number of kilometers covered, 3 - Number of active builders uploading pictures
Why lack of more KPIs: Do not measure sales since the level is so low and the level of sales will not impact their objectives and decisions.

Comments about measuring: Everything that Mapillary do is measured automatically through their computer system and in that system they can analyze most statistics for example regarding the users in their community. Track behaviour etc. Every 2-3 months they extract more information through the IT system to get deeper understanding of the community trends.
Reports / Follow ups: This is measured per week
Do measure outcome impact strategies & work process: The ways of working dont change depending on the outcomes of the measures but if they mesures indicate problems (bottle necks etc) then they try to fix those issues. The measures direct their work and their efforts so these measures can be maximized
Managerial background: CEO has managerial experience from successful startup and large corporation
Stage in which the management expertise came: From start
Current number staff in total: 13
Staff awareness about measures: Yes, Weekly update
Measure based incentives/salaries: No, The incentive system is not connected to the performance measures
Anything special regarding measurements that investors wanted to see: Recently the company gathered venture capital and the investors wanted to gain a lot of information which Mapillary extracted through their IT system. This was for example regarding their community but also financial, regarding the market potential. Retention (do old user stay active) Difference between markets etc
Advice to other startups:
Further comments:

Company name: Disruptive Materials

Interview person and date: CEO, Mattias Karls, 29 Feb 2016
Sector: Biotech

Business overview: Sell and holds the patent for Upsalite, a material with world-record water adsorption characteristics. R&D in own laboratory but manufacturing is made externally
Initial idea/background: The material was developed at Uppsala University and the company was formed after the material gained attention in the press.
Year active: September, 2013.

Stage 2 - Commercialization stage: Focus: Building the business
Objective in stage 2: Growth of the company in all areas: Developing business strategy since it is a new area for everybody involved, R&D, build manufacturing and sales which must be balance between each other.
KPIs in stage 2: Yearly goals for the company in the following areas. Since a new area it is difficult to set realistic goals since outcome can vary a lot. The measures has not changed much over time but the main customer segment has received its own measure to put focus on it.
Financial / Sales: targets for 3 special customer segments,
Customers: Nr of desired customers, Nr of distribution agreements, quality goes before quantity since the customer potential is most important in this initial stage.
Main customer segment: qualitative and quantitative goals for building the presence in this segment. For example hiring specialists, innovation, sales
Production: building of capacity
Intellectual property: nr of patents, intangible property
Recruitment: how it goes in planned recruitment
Marketing: Nr of newsletters, press releases, visitors on web page etc

Comments about measuring: Goals can be created or abandoned often when they are discovered to be irrelevant
Reports / Follow ups: Once a month the staff and the external owners receive a report that compare the current status with the set targets. It is indicated with traffic lights (red, yellow, green) to clarify if the performance is on track or not.
Do measure outcome impact strategies & work process: Upsalite is a new material and the company is learning how to best exploit it in the market. Therefore the outcome of the measures can indicate bad strategy instead of bad performance. For example in sales the company learned that not all customers and sales were worth the extensive sales processes. Hence, the company started to measure sales in desired segments instead of general sales
Managerial background:CEO has managerial degree and managerial experience from 2 successful startups
Stage in which the management expertise came: From start
Current number staff in total: 6
Staff awareness about measures:
Measure based incentives/salaries: Yes, all staff has salaries both dependent on the outcome of the measures related to their work efforts and to the measures of the company as a whole. All staff are also part owners with small shares. CEO owns more shares and has a higher degree of measure oriented salary based on all the companies measures

Year in which the company makes profit:
Thoughts about future: In a few years there will be more focus on sales volumes
Anything special regarding measurements that investors wanted to see:
Advice to other startups:
Further comments: If not co owner it would be more interesting to grow fast. Since own patents no real hurry to grow.

Company name: Climeon AB

Interview person and date: CTO, Joachim Karthäuser, 26 Feb 2016.
Sector: Cleantech.
Business overview: Climeon is a stockholm-based company that produces clean and sustainable energy. They have developed an innovative technology named C3, which converts low temperature heat to sustainable electricity.
Initial idea/background: Their initial idea was to create sustainable energy through solar power, however the idea evolved to a more complex solution that fits better to their market target segment.
Year active: 2001: Feb

Stage 1 - Research stage: Focus: Scientific research on how to solve the problem of producing sustainable energy. At the same time, they had to seek for funds in order to cover the cost of equipment and research, but no salaries.
Objective in stage 1: The objective was to meet potential customers in order to identify how to satisfy their needs with ClimeOn technology. Another objective was to solve technical problems in regards with their technology and research.
CSF in stage 1: Interaction with potential future clients and meet their quality standards. They needed to develop a product that reduces CO2 emissions and produces sustainable energy.
KPIs in stage 1: Based on technology specifications of their product. Number of customer leads. Cost per machine. Number of attended conferences.
Cause-effect relationships: The efficiency and cost of their technology were the arguments for the funders to raise capital and develop their company.
Why the lack of more KPIs: The management believes that the most important aspect of their organization is the quality of their employees. And if you hire experience and competent individuals, there is no need to supervise them so much, instead, let them do their job.
Comments about measuring: They did not consider necessary to track many variables, except for their tech specifications and cost of producing their machines. They measured some indicators such as sales, but they do not keep track of the details on how to make sales.
Reports / Follow ups:
Do measure outcome impact strategies & work process:

Stage 2 - Commercialization stage: Focus: Build relationships with clients, increase

sales, receive feedbacks and improve their technology.
Objective in stage 2: Develop a good product and recruit people who are experienced and capable of selling their products
CSF in stage 2: High industry experienced sales crew and feedbacks from clients.
KPIs in stage 2: Quality of the product (sales arguments), number of returned products, customer satisfaction indicators, amount of sales, production cost ratios, number of letter of intents (contracts with clients).
Cause-effect relationships: Good quality of the products and constant feedbacks from clients cause long-term value.
Comments about measuring: Their goal as a company is towards good CSR figures for the environment and good profitability for their shareholders. Therefore, most of their performance indicators are focused on their technology and profitability.
Joachim believes from experience that measuring many KPIs does not bring so much value to a business. Before when he was working at a big company he was feeling uncomfortable when he was asked about how many calls he made, etc. He wanted his supervisors to trust him and let him do his job. He believes that it is all in the mentality of people, some salespeople like to be told how many calls they should make, but it is psychological, some salespeople feel motivated by KPIs such as number of calls and meetings. But at the end it is the number of sales what is important.
Reports / Follow ups: Weekly follow ups with sales crew.
Do measure outcome impact strategies & work process:

Stage 3 - Growing stage: Same as stage 2, but they are not looking for venture capital or going public to be able to support their growth.
Objective in stage 3: Reduce production costs, and increase the market share and the number of relationships.
CSF in stage 3:
KPIs in stage 3:
Cause-effect relationships:
Comments about measuring:
Reports / Follow ups:
Do measure outcome impact strategies & work process:

Managerial background: Karthäuser has previously worked in larger corporations.
Stage in which the management expertise came: Research stage
Current number staff in total:
Staff awareness about measures: Weekly updates with sales team.
Measure based incentives/salaries:
Year in which the company makes profit: Early stage
Thoughts about future: Climeon has decided to not acquire capital through an IPO at the moment.

Company name: Heliospectra AB

Interview person and date: COO, Chris Steele, 3rd March 2016.

Sector: Agrotech
Business overview: Heliospectra is a company that develops and sells efficient lighting systems for control of the plant growth and its quality.
Initial idea/background: The background of the founders is within biological sciences. Later, the founders went to a business incubator to create a product that stimulates growth in plants through LED growth lighting systems.
Year active: 2006

Stage 1 - Research stage: During their research stage from 2006-2011, they received some funds from their business incubator. Later they applied to other funds from investors, series A and B. Their major capital injection back then was 20 million SEK.
Objective in stage 1: Fund the research and solve the technical problems.
CSF in stage 1: Achieve good results from the research and obtain funds to support the research stage and the product development stage (Research driven).
KPIs in stage 1: Based on tech specification of the product: reaction levels of the plant, flexibility of their technology, lighting properties, power controls.
Cause-effect relationships: Good results on the research affected the likelihood of getting funds for continuing the research.
Why the lack of more KPIs: There was not a clear product yet, nor an identified market segment that would allow them to generate sustainable income.
Comments about measuring:
Reports / Follow ups:
Do measure outcome impact strategies & work process:

Stage 2 - Commercialization stage: Focus: Attract and sell to research based clients.
Objective in stage 2: Once the management expertise came, the company had to monetize the research. The first objective was to identify who was the appropriate customer, then turn the intangible research into a tangible product and finally sell it.
CSF in stage 2: Find the right market segment.
KPIs in stage 2: Tech specifications and financial statements.
Cause-effect relationships: By defining their market segment, they were able to identify their ideal customer and produce all the needed marketing and business material to attract them.
Comments about measuring: Their lab knows exactly which KPIs will support the sales team or other departments in order to perform well. KPIs as such are not interconnected yet, but every department knows what their individual objectives are. Communications exist between the departments: sales team receives feedbacks from customers, later they send it to the research lab, and finally the research lab coordinates with the tech department to develop a new or improved product.
Reports / Follow ups: Due to the fact that Heliospectra is a public company, they are committed to report financial figures periodically.
Do measure outcome impact strategies & work process:

Stage 3 - Growing stage: The objective has been further expansion since 2012. Heliospectra wants to be seen as the leading company in their space.
Objective in stage 3: Continuous R&D, increase sales, brand awareness, customer

loyalty, referrals by customers and word of mouth.
CSF in stage 3: Develop products around the needs of their most attractive clients.
KPIs in stage 3: Tech specifications, website traffic indicators, delivery time, sales and leads generated from trade shows.
Cause-effect relationships:
Comments about measuring:
Reports / Follow ups:
Do measure outcome impact strategies & work process:

Managerial background: Christ had previous managerial expertise before joining Heliospectra. However, before he joined the team, there was not management expertise because most of the staff were biologists. The team during the research period did not have a clear understanding on how to operate a business and monetize the efforts for short results and long-term value creation.
Stage in which the management expertise came: Commercialization stage.
Current number staff in total:
Staff awareness about measures:
Incentives for measures on CSF (bonuses for high KPIs)
Year in which the company makes profit: 2012
Thoughts about future: They want a system that allows them to see clearer the interconnection/linkages of different KPIs across their departments, in order to act faster in case of necessary change.
Anything special regarding measurements that investors wanted to see:
Advice to other startups:

Company name: OrganoClick AB (publ)

Interview person and date: CEO, Mårten Hellberg, 4th March 2016.
Sector: Chemistry
Business overview: Organoclick is a company that develops environmentally friendly fiber based materials.
Initial idea/background: The idea started as a research project from two academic professors and in 2004 the first patent was created. In 2006, OrganoClick was founded when they involved an entrepreneur and an incubator with management and entrepreneurial experience that could materialize the research into a product in the future.
Year active: 2006

Stage 1 - Research stage: Their initial product development stage was from 2006-2012. Back in the beginning the idea was to get in contact with potential clients that could finance a research or potential projects in order to create a product with their technology. That process helped them to understand their market potential. After a year they had 4 big projects with global companies, which allow them to have revenues from very early stage.

Objective in stage 1: Look for a third company that was interested in investing in their product development in order to develop new products that goes in line with their core technology.
CSF in stage 1: Find companies that are interested in finance OrganoClick development in order to develop a product with their technology.
KPIs in stage 1: Tech specifications (Depending on the customer's specifications or quality standards). Amount of funds raised from different capital sources (government, customers/clients, personal investors).
KPIs such as number of projects obtained from companies, number of visits to potential clients, number of contacts with potential clients and number of signed projects/contracts.
Cause-effect relationships: Signing a contract or being funded by a global well-known company, gave brand recognition among potential clients in the industry to OrganoClick.
Why lack of more KPIs: There was no need to track anything else but, the tech specifications and the number of contracts to finance the research and create products for clients.
Comments about measuring: In technical development there are 3 stages (pre study, development project and process scaling project) and for each development projects they were measuring if they were succeeding. According to them, from 2006 to 2008 they did not have any product to be able to measure something else than technical specifications. If they went back in time, they would have measured more about the likelihood of success of a project. They did not have expertise about when to shoot down a project. If they knew that, OrganoClick could have saved resources such as money and time. Sometimes, they were keeping too long with some projects that could have been shooted down earlier. They should have measured more about meeting the customer's requirements in the first place.
Reports / Follow ups: They had to report the results of their development work to their "contractors" which are the companies that financed their research.
Do measure outcome impact strategies & work process:

Stage 2 - Commercialization stage: After the research projects were conducted, proved successful and the companies that financed the development work benefited first than the competition, Organoclick could offer its technology to other potential clients and expand their market share.
Objective in stage 2: By 2013 their revenues started to increase rapidly. The objective was to maintain and increase their international clients. They realized that they needed to prepare the organization for a future expansion.
CSF in stage 2: Customer collaboration, meaning that they collaborated with their customers when developing their products.
KPIs in stage 2: Success of product development projects was absolutely their most important KPI. Other KPIs are product quality, customer satisfaction and their feedbacks, number of rejections from customers and sales to clients.
Cause-effect relationships: Quality and customer satisfaction towards amount of sales.
Comments about measuring: If the customer is buying more from you then it is because they are satisfied. So it is good to track that you are not only selling more to different customers, but also that you are selling more to the same customer.

Reports / Follow ups:
Do measure outcome impact strategies & work process:

Stage 3 - Growing stage: In 2015, they went through an IPO
Objective in stage 3: When they were expanding, they had to build a bigger factory. During the last three years they had had more than 100% increase in revenues yearly. They listed the company in Nasdaq Stockholm in order to support the development of the company and the international expansion.
CSF in stage 3: Build a bigger factory, create good products and have satisfied customers. Increase sales activities such as meeting with customers. To support the commercialization expansion, they hired a sales crew.
KPIs in stage 3: All the KPIs from stage 2 and financial statements. Besides, for measuring innovation: Staff could come with internal ideas. Organoclick measures how many ideas are brought to the company, and how many of those ideas are worth it. They measure the number of ideas that succeed in the development process. They also measure the number of patents that are filed every year, and the patents that are approved. They also measure staff satisfaction.
Cause-effect relationships: Yes, their BSC allows them to do it. marketing efforts towards sales for example.
Comments about measuring: In 2014 they started to work on the BSC, because they wanted to get the ISO9001 certification. It took them 1 year to set up the balance scorecard system and how it would be done.
Reports / Follow ups:
Do measure outcome impact strategies & work process:

Managerial background: Hellberg has had previous experience in startup's development as an entrepreneur and was an elite athlete.
Stage in which the management expertise came: early stage (between research and commercialization).
Current number staff in total: 30
Staff awareness about measures: They know about their specific units/departments
Measure based incentives/salaries: No
Year in which the company makes profit: early stage
Thoughts about future: They want to measure the background of their staff later on and how it will affect the value creation of the firm. They also would like to improve their efforts for talent attraction. They will measure more about: customer satisfaction, total impact on the nature (they are a green tech company), talent attraction, organoclick brand.
Anything special regarding measurements that investors wanted to see: Organoclick made emission of shares to private investors at 4 times in between of 2008 – 2013. The investors primarily looked at which customers they collaborated with and the agreements with them. In the later stages, they looked at their sales growth.
Advice to other startups: A startup must be flexible, and as soon as you realize something is not going as planned, you should act and redesign the strategy or process.
Further comments:

Company name: ChargeStorm AB

Interview person and date: CEO, Patrik Lindergren, 11th March 2016.
Sector: Cleantech
Business overview: Chargestorm is on a mission to create the best charging station solutions for electrical vehicles on the market.
Initial idea/background: The founders had a background of product development, engineering, and startup experience. They decided to build up and sell products in the area of smart charging infrastructures for electrical vehicles.
Year active: 2009

Stage 1 - Research stage: During this period, they were focusing on developing the product and find the first customer. It took them about one year without salaries. They supported their product development stage with the income they received from working somewhere else.
Objective in stage 1: Generate a revenue stream that can support the costs, and avoid VC.
CSF in stage 1: Get the first customer and develop quality products.
KPIs in stage 1: KPIs based on tech specifications.
Cause-effect relationships:
Why lack of more KPIs:
Comments about measuring:
Reports / Follow ups: It was not necessary to do a BSC, as their focus was sales and product development.
Do measure outcome impact strategies & work process:

Stage 2 - Commercialization stage:
Objective in stage 2: Attract customers and influence competitors to use their technology.
CSF in stage 2: Find partners that will drive your business towards a more profitable company.
KPIs in stage 2: Financial and market indicators: Sales, profitability, pipeline, ROI, market value, market share.
Cause-effect relationships:
Comments about measuring:
Reports / Follow ups: They primarily reported to the shareholders once a month. Some of the reported KPIs where from the financials such as profitability, pipeline, ROI, market value, market share. Besides, once a week they follow up with the employees in regards to their objectives. To track their KPIs, the management uses a dedicated system.
Do measure outcome impact strategies & work process:

Stage 3 - Growing stage:
Objective in stage 3: Increase market share

CSF in stage 3: Build strong and long-term relationships with customers and high product innovation.
KPIs in stage 3: Same as stage two.
Cause-effect relationships:
Comments about measuring: All their efforts are focused in innovation and constantly developing new products, however, they do not have any strong measurement tool for it.
Reports / Follow ups:
Do measure outcome impact strategies & work process:

Managerial background: Both of the founders had entrepreneurial and management expertise in their backgrounds.
Stage in which the management expertise came: 2009
Current number staff in total: 15
Staff awareness about measures:
Measure based incentives/salaries: No
Year in which the company makes profit: Since first day
Thoughts about future: They might go public to accelerate their growth, but nothing for sure yet.
Anything special regarding measurements that investors wanted to see: They are completely self financed, so they do not have the experience.
Advice to other startups: Get the first customer and get a technical and market leading position. As a side effect of it you will be profitable since the beginning. Do not get used to live from the funds of VC, focus on developing your product or service and generate your own revenue stream. You can generate some income a side from your business idea to fund your startup, but you have to believe and prove to others that your idea is worth it. The mentality in Chargestorm is to create good products, sell to customer and make money to pay the bills. And that is the key to succeed. Then you will grow together with your customers. Find customers that you could treat them as partners. They will give you good feedbacks to improve. Innovation happens all the time along the way, you can not stop improving your first model.
Further comments: They are mainly selling in closets markets such as Norway, Finland, Denmark, Poland, Sweden and Spain.

Company name: Min Doktor

Interview person and date: CMO, Carl Jansson, 18th March 2016.
Sector: Digital Healthcare
Business overview: MinDoktor is a company based in Malmo that provides healthcare online to people that are looking for initial medical check out. They collect data from patients first and then a software decides which level of care the individual needs.
Initial idea/background: It started as a hobby project with a doctor and a developer, the initial idea was to attend a specific kind of patient. Those patients treatments process were the perfect candidate for digitization.

Year active: 2014

Stage 1 - Research stage: Their focus was to find capital to further develop their mobile application and maintain it.
Objective in stage 1: The objective was to digitize the medical process, attract investment from different sources to build the company and identify early customers.
CSF in stage 1: Building a MVP so we could test the market. They had to create a MVP so it would help them to conversion leads to sales and optimization the generation of sales (Product development driven).
KPIs in stage 1: Number and type of cases and registered users.
Cause-effect relationships: If the early users had a good online experience, they would come back and talk about their application. That would affect their future brand image.
Why lack of more KPIs:
Comments about measuring: When they were looking for capital investment, they realized that they did not have answers for many questions that investors had for them. They did not know what the investors were looking for estimated customer lifetime value and cost per customer acquisition. You need to prove that the CLV is higher than the cost per acquisition in order to say that you have a disruptive idea that can scale. They slowly figure out that there are KPIs that all startups should be measuring. Define which KPIs are crucial for their short and long-term success. How product development and growth are tightly connected to KPIs. It was until that point of seeking for capital that they started to quantify their business and vision. It was an internal challenge to quantify the vision. People need to understand that an organization works systematically and your work affects this individual KPI and we need to bring that from X to Y. Besides, if they could go back in time they would have measured the customer funnels, conversion rates, customer retention and identify the pain points in their products.
Reports / Follow ups:
Do measure outcome impact strategies & work process:

Stage 2 - Commercialization stage: Expand their service to other segments of the market. The idea was to increase the user base and reach other kind of potential clients such as insurance companies. They had to hire more employees such as a nurse, a sales people, designers and developers to support the development and market expansion.
Objective in stage 2: Increase the user base and data into the system. Improve the application in accordance to the feedbacks from user experience. Sales are also a priority.
CSF in stage 2: Identify who are the potential clients and sign a contract with at least one of them. Set and test a customer lifetime value. Build a team that supports the startup (Customer driven).
KPIs in stage 2: There was no need to measure more than: Number of user base, number of active patients, number of cases, customer retention, number of times people get sick per year, number of paying clients.
Cause-effect relationships: Higher number of people using the app was a sign that the mobile application was working. The increase in user base allowed them to attract potential clients. Nevertheless, one problem associated with signing a contract with one of their initial enterprise customer, was that they thought that they had a great product for their private patients and they stopped innovating it. Thus, that assumption later on

affected both the private patients and MinDoktor negatively.
Comments about measuring: They are in the process of quantifying more KPIs. Up until 2015, they were not measuring anything, but number of cases of patients and ROI. They also were looking at the amount of invested money to get one more customer.
In the strategic management level, they check the ROI, and the conversion rate. They also look at the customer retention and customer experience throughout the customer experience in the mobile application: where is the point where they lose customers, how many customers come back. They analyse the patterns of people with different in regards to the usage of their application. For example: people with cough normally come back, but the people with fever do not come back – so that is some information that allows MinDoktor to analyze their areas of improvement in regards to the treatments or user experience for people with fever.
Reports / Follow ups:
Do measure outcome impact strategies & work process: Yes, as soon as they realize that there is something going wrong, they change actions that will help them to achieve their goal

Stage 3 - Growing stage: This stage just started and it is in process.
Objective in stage 3: Build the brand, raise brand awareness and be top of mind.
CSF in stage 3: Increase the user base nationally or internationally (countries with similar in the healthcare system at the beginning). Breakdown responsibilities to all the teams so they know which KPIs are responsible for and identify their linkages. Identify in a clearer way the CSFs of MinDoktor. Improve the consumer product so it does not fall behind in innovation.
KPIs in stage 3: No specifically but they are shifting focus towards optimizing CPA/CLV and identifying KPIs that are broken down on a team level, so that everyone can grasp how their work affects the business in total.
Cause-effect relationships:
Comments about measuring: They are not measuring something that indicates how effective and efficient the processes within Min Doktor are yet.
Reports / Follow ups: Their objective during this stage will be to communicate better with the entire organization about the KPIs.
Do measure outcome impact strategies & work process:

Managerial background: Carl has a background within management, marketing and performance management.
Stage in which the management expertise came: Stage 2

Current number staff in total:
Staff awareness about measures:
Measure based incentives/salaries: Yes in a sense. Bonuses will be paid out depending on certain results.
Year in which the company makes profit: Profit from their core technology has not been reached.
Thoughts about future:

Anything special regarding measurements that investors wanted to see: If you need VC, the investors are looking for the estimated customer lifetime value and cost per customer acquisition; you need to prove them that the CLV is higher than the cost per acquisition in order to say that you have a disruptive idea that can be scalable.
Advice to other startups: You cannot do data driven product development from the beginning, it has to be the vision to creates the first product – The public might not be able to give you the data that you are looking for because they do not know what you are trying to do. Nevertheless, as soon as your MVP is available for testing, start measuring and quantifying your business since the very beginning, you will thank yourself in the future. Even though you cannot benchmark measurements because it has never been done before in your startup field, you still can measure and compare your stats every other time, just so you know if next month something has changed. Marketing for tech startups is being the customer representative within the company, it is about following the customer's journey from first impression until they come back and use the service again. And that journey has to be quantified in every step, so you know if marketing, product, follow ups, anything have to be adjusted.
Further comments: Min Doktor did actually measured all the data from the start. However, what they lacked was a shared internal terminology and a metrics framework in which everyone agreed upon. This highlights that the question is not what you measure, but why you measure it. If you do not have a frameworks in place, you either do not follow the numbers or find yourself in analysis paralysis where you cannot do anything because you are afraid you will misinterpretate the numbers. Without a shared terminology and a few simple KPIs, the numbers can end up meaning totally different things to different people across the organization, and it can be dangerous.
For example, Min Doktor has always measured how much they make from a single sold unit, but they did not have the solid math to predict lifetime and churn/retention, all factors that an investor is looking for. In their meetings with the investors, it became clear that they were looking for other numbers than the ones that Min Doktor was looking at. Most of the times, they were the same numbers, but viewed from different perspectives. Their meetings with different VCs helped them clarify their own Kpis and realize which ones they should focus on internally and which ones are important from an investor perspective.
What specific KPIs was Min Doktor able to clarify and focus for internal purposes after the meetings with the VCs? In short, you could describe it as a discrepancy between what we need to know to improve (very granular) and what VCs need to know to make a split decision whether to invest or not. Which KPIs were important from an investor perspective (besides CLV and cost per customer acquisition)? the KPIs need to be very high level and when they are high level they are not very useful for internal governance.

Appendix #2

This appendix contains the interview guide used with during the interview sessions.

Identify:

- Orientation: what is their actual focus, what do they want to achieve?
    - How are they making sure that they will achieve their goal?
- What measures are important to take into consideration for that focus?
    - Find out what are the success factors
- What is their monitoring process to see if they will succeed with the strategy
    - Find out how are they measuring their performance?
- Have the measurements change through your previous stages/business orientations?
    - Find out their tipping points

Interview questions:

Background

1. What is your company doing? What do you offer to your customers?
   Understand the company business

2. How long have you been in business? Can you tell us about your company´s journey so far? How many employees?
   Figure out their maturity

3. What is your overall strategy? What is your present objectives? What are you striving for? What is you focus? (Grow, Catch investors, Making money)
   Know objectives

4. How is your revenue model? How do you making money?
   See how is their financial performance
   Verify their orientation (maybe they are not focused yet on sales)

Performance measurement

5. What is the background of the management?
   Do you have experience about managing the development of a startup?
   Control questions: the answers from the different interviews will depend on the background of the manager

6. Is there any managerial tools you think you are lacking? Does your company have access to managerial expertise?

7. Do you measure your performance?

Why, why not? What is your view on this subject?
Do you rate this as important and beneficial?
Check if it is relevant for startup managers to measure performance

8. Do you work with particular system, balanced score card etc?
   Check if they have a system for measuring performance

9. What do you measure?
   Understand what non-financial and financial measures they use

Which indicators (non-financial) have a greater impact on your vision?

a. Do you measure something about "how does the customer perceive the quality of the startup service/product? To identify needs of customers
    i. Market share, customer loyalty, customer acquisition, customer satisfaction, customer profitability, profitability per customer. Looking ahead: Characteristic of P&S such as functionality, quality, time and proce; Customer relations:quality of purchasing experience and personal relations; Image and reputation of P&S
b. Internal perspective: Do you measure something that indicate "how effective and efficient are the processes of an organization? It is important to gear to the requirement and needs of its customers. So customer-focused measures must be transformed into internal measures
    i. quality of product innovation, quality, time, productivity and cost; innovation process, operational process, after sales service
c. Growth and Learning perspective: Do you measure something that indicates if the startup is capable of innovation and improvement?
    i. Indicators that reinforce: core competences, staff satisfaction and their development, the role of the organization for integrating and finding synergies with the customer.

Which financial indicators have a greater impact on your vision?

A. Do you measure something about (financial perspective) factors that generate proceeds for the shareholders? Factors that reveal the economic effect of the other 3 perspectives (cause-effects)
    a. Return on investment, Economic value added, growth in net results, added value per employee, cost ratios, sales growth in new markets (future), net profit on new products

10. How do you measure your performance towards your vision?
    Understand what is their mechanism to conduct performance management

11. What is your:

a. Strategy
b. Objectives
c. Critical success factors
d. Key performance indicators, measures

12. Is there anything you wish you were measuring?
    a. What are the challenges of measuring that?

13. Do all your staff know what you are measuring on different levels?

14. On a scale on 1-10
    a. how important is for you to (explain the financial perspective)? Why?
    b. how important is for you to (explain the customer perspective)? Why?
    c. how important is for you to (explain the processes perspective)? Why?
    d. how important is for you to (explain the learning perspective)? Why?

15. How do you report to your stakeholders (management team, board of directors, investors)?
    a. To whom do you show the report? who is interested in your report?

16. How often do you discuss the outcome and make plans?

17. Do you change strategy if the outcome of the measures is not to satisfaction? How?

18. How often do you revise measures?

19. What are your thoughts regarding performance measurement and motivation, aligning the staff with company goals?

20. Are there incentives and salaries based on the measures? sales or other areas?

21. Has the measurement changed during the life of your company? Do you think it will change in the future?
    Identify if they have passed through different orientations, from increasing user base, developing a product, acquiring venture capital, etc.

22. If you got the chance to go back in time, what would you have done differently, when it comes to measure performance indicators?

23. What do you see in the future regarding objectives and measures?

Organizational stages

24. Do you see the life of a startup in different stages, with different objectives, from born to mature?

25. What stage are you in?

26. internationalized? to what extent? from the beginning?

27. When you were in the (for example Idea stage, Growing stage, Maturity stage) what was your main goals?

28. How did your objectives and measures change through the life of your company?

29. Where do you want to take your company, what is your current vision? Find the Minimum viable product, Growth, VC, Initial Public Offering, Merger, Acquired (selling the company)?