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The Multi-Business Startup

A study of challenges and considerations concerning strategy, organization, and prioritization

Master's thesis in Management and Economics of Innovation

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Cover:
Chess player making a move

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PREFACE

The study that resulted in this report has been conducted in collaboration with a Swedish startup in the healthcare industry. We would like to thank everyone at the company who has contributed in different ways by providing us with access to information and setting off time for interviews and discussions. We wish them the best of luck with their future endeavors. The data collected throughout these months have been essential for the findings in this report.

We would also like to thank our supervisor, Henrik Berglund, who has been giving us valuable feedback and input throughout the project. This has contributed a lot to the study and this report that was produced as part of it.

Lastly, we would like to thank Chalmers University of Technology as a whole, for providing the solid academic foundation, as well as inspiration, necessary to complete this work.

Gothenburg, May 2021

Jesper Alm and John Lindblad

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SUMMARY

Multi-business strategies among startups, as well as entrepreneurial methods combining qualitative and quantitative data analysis with experience to enable decision making, are arguably both insufficiently researched areas. This project sought to answer two research questions on these topics. First, why and how startups can pursue multi-business strategies; and second, how teams can combine qualitative and quantitative data analysis with experience and domain expertise to help to prioritize their development backlog. A case study of one Swedish startup in the healthcare industry enabled analysis of these two questions.

The data collection consisted mainly of participant observation, as the two researchers worked within the studied company. The study is achieving a well-defined picture of the company and its practices through discussion with several key individuals in the company, as well as day-to-day work with business intelligence. Conducting additional semi-structured interviews enhanced reliability and mitigated potential biases. Compilation and thematic analysis of all data lead to a discussion of the research questions supported by previous literature.

The study resulted in deepened insight into the problems and considerations of a multi-business startup. For example, we unearthed challenges connected to resource allocation, organizational structure, and prioritization of feature ideas. Concerning the question of combining data with experience, it became evident that all approaches (qualitative data analysis, quantitative data analysis, and experience) are necessary but need to be thoughtfully combined. Qualitative input from the user perspective seems the most challenging to incorporate, but businesses should aim to do so at all levels of the business. Combining the idea of a so-called One Metric That Matters (OMTM) with an experimental approach might help lead the focus of the firm.

In conclusion, the study suggests that multi-business startups face challenges that single-idea ventures might not encounter. However, it is important to employ the ideas of traditional entrepreneurial approaches in this new setting. We propose a checklist for practitioners pursuing a multi-business strategy to help direct their analytical and strategic focus to some key tradeoffs and considerations.

Keywords: lean startup, agile, startups, data analytics, entrepreneurship, multi-business strategy

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1 Introduction

"Today's 'best practices' lead to dead ends; the best paths are new and untried"

- Peter Thiel

Lean Startup has become a best practice for building startups and fostering innovation in large companies. However, as argued by Peter Thiel and others, there are reasons to question whether following best practices is the only way to achieve breakthrough innovation. Innovators are aiming to change the world or bring something new into it. Using conventional entrepreneurial methods for building innovation is one way to do this. Another is to consider new ways to build startups. Most scholars and thinkers within entrepreneurship advise startups to focus all their resources on one idea at a time, often for good reasons due to the scarcity of resources that characterizes the typical startup. While diversification is a common strategic means in the context of large corporations, multi-business strategies among startups are neither extensively studied by academics, nor tried out by entrepreneurs. Lean Startup and the single-business paradigm have been and still are, useful for tech startups. However, the idea of running only one business area at once is rarely nuanced. No one has, to the knowledge of the researchers, done extensive research on the potential reasons for pursuing a multi-business strategy as a startup and the challenges that may emerge for the companies making such a strategic choice. Despite the usefulness of the single-business startup strategy, there may be circumstances when a multi-business strategy is a better fit. This motivates a deeper dive into the practical challenges and trade-offs that such firms are likely to encounter.

"Most people use statistics like a drunk man uses a lamppost; more for support than illumination"

- Andrew Lang

Data-driven decision-making, machine learning, and everything else related to data and analytics are getting more and more space in the discourse around business in general and startups in particular. Advances in Deep Learning, successful businesses based on data such as Facebook and Netflix, and books like Lean analytics have contributed to increased awareness of data science and the potential of analytics. Also, many of the popular books among entrepreneurs are highlighting the need for data-driven decision-making (Croll & Yoskovitz, 2013; Ellis & Brown, 2017; and others). However, there is arguably a lack of understanding of how to combine quantitative data with qualitative data and experience. Literature about this topic is often philosophical and rarely building an understanding of how to do it practically. For startups, basing decisions only on data becomes problematic since they have the ambition to build something new which by definition is not present in historical data. Furthermore, there are other problems with becoming too data-driven in the early phases of a company. User data might be too scarce to perform a proper analysis, and the product might change so often that the data becomes hard to interpret. An overreliance on quantitative research might become misleading, and there is a need to add user interviews and other qualitative research to provide profound insight. Basing decisions solely on experience is insufficient, since such an approach is prone to human cognitive biases, and experience consists of a small set of, often misrepresented, observations. Nevertheless, the idea that qualitative data, quantitative data, and experience combined are stronger than any of them alone is more easily accepted. For example, some argue that quantitative research is useful to uncover correlations in data, and qualitative methods are good for explaining and understanding patterns uncovered in the data (Croll & Yoskovitz, 2013). Yet, how to combine these data sources in practice is harder and more rarely spoken about. Furthermore, pure observation and data-driven methods are non-existing in practice since observations are always made through some kind of theoretical lens. Thus, it is insufficient to rely on observation without any kind of filtering or

interpretation (Deutsch, 2011). This is arguably particularly true in the startup world with limited resources and a need to make quick progress to survive.

These two issues, multi-business strategies among startups and how to balance data-driven methods in early-stage decision making, are interesting from the practical perspective of the entrepreneur and the theoretical perspective of entrepreneurship researchers. To study them in the context of a real venture, we conducted a case study of a Swedish early-stage startup in the healthcare industry. The company had been operating for three and a half years at the beginning of this project since its foundation in 2017. It has offices in Stockholm and Barcelona, employing around 20 people at the time of finishing this thesis.

The company builds a collaboration platform for radiologists, based on the founders' experience of problems with storing radiology data from the healthcare industry. As of now, the company is pursuing three different business areas called education, research, and workspace. The researchers have throughout the project been working within the workspace business area, why most of the data collection and analysis comes from there. Workspace is an online community. It is much like what Stack Overflow is for software developers, although it has specific functionality required to handle radiology data. Any certified radiologist can join the community to collaborate with others, either in closed groups or openly within the whole community.

To fully understand the workspace business area, one needs to understand domain-specific aspects of online communities such as incentive structures and platform moderation. Incentive structures and other specifics are necessary to understand at the level of the healthcare industry as well since they might be different from those present in other contexts. Furthermore, network effects are a characteristic of online communities, and the company hopes that strong network effects will make user value in the open community increase as it grows bigger. Potentially strong network effects in the future are behind the company's decision to pursue the workspace business area alongside the other ones, even though they are more likely to generate revenue in the short term. Workspace, research, and education all rely on the same technical platform, but there is also specific functionality on top of it for the different business areas. The reasons for pursuing multiple business areas are primarily that business opportunities have occurred in all of them already and that the company, in addition to technical synergies, sees benefits with offering customers a wide assortment of products.

During the work with this project, it became clear that the company faces interesting challenges and considerations within several different strategic levels, mapping to different domains within management literature. For example, the company's overall entrepreneurial approach is relatable to widely known methods such as Lean Startup and Lean Analytics. During the project, the company changed its organizational model, structuring the team into cross-functional squads. Many concepts related to the transition derive from the fields of agile and scrum. The new organization model was also inspired heavily by that of Spotify. The company sees potential in understanding their user base better and initially wanted the researchers to help them with new methods for analyzing user data. However, also other aspects related to balancing quantitative data with other information sources such as qualitative feedback appeared throughout the project. To understand the issues and considerations related to this, there was a need to research the theoretical fields of product development and data analytics.

This project aims to study challenges and opportunities for a startup pursuing a multi-business strategy and how to combine data analysis with customer feedback to support the growth process. Furthermore, there will be a review of books and academic literature on entrepreneurial methods for the specific

context of this multi-business strategy and a professional online community. More specifically, we will provide answers to the following research questions:

1. *Why and how can startups pursue a multi-business strategy?*
2. *How can teams combine qualitative and quantitative data analysis with experience and domain expertise to help to prioritize their development backlog?*

2 Literature Review

The purpose of this literature review is to map out previous research and knowledge. The chapter consists of two subject areas: (2.1) Product and Business Development, and (2.2) Network Businesses. The first area compiles literature related to the process of building products and businesses, focused on the startup context. The second area is more specific about the network business model of the company in the case study.

2.1 Product and Business Development

This section reviews literature about product and business development for startups. The section includes more strategic literature on how to approach the product and business development process but also more specific literature on analytics and how to combine qualitative and quantitative data.

2.1.1 Entrepreneurial Approaches

A distinction between two approaches to entrepreneurship, the experimentative and the transformative, is valuable to understand different ways to build startups. The experimentative approach builds on attempts to discover the external environment. This implies that the world exists independently of the entrepreneur and that their role is to discover entrepreneurial opportunities and reduce uncertainty by gathering information about the world. The transformative approach views the world as constructed and the role of the entrepreneur to create entrepreneurial opportunities and reduce uncertainty by shaping the world. (Berglund et al., 2020)

Arguably one of the most popular and influential startup methods in recent years, Lean Startup, is an iterative approach to running a startup. Figure 1 shows the Build-Measure-Learn cycle which is at the core of the Lean Startup method (Croll & Yoskovitz, 2013, p.xxii). Build means turning ideas into code (for software products), Measure means turning code into data by measuring how users interact with the product, and Learn means turning data into new ideas that inspire updates to the product and a new iteration through the cycle (Croll & Yoskovitz, 2013, p.xxii). One of the main goals of startups using this approach is to maximize the speed of iteration through the cycle (Ries, 2011). This builds on the idea that the best way to reduce uncertainty and make continuous progress is to make feedback loops between customers and product developers as tight as possible. This approach is highly experimentative since the process centers around the idea of building a minimum viable product (MVP), launching it to customers, and testing whether they like it or not.

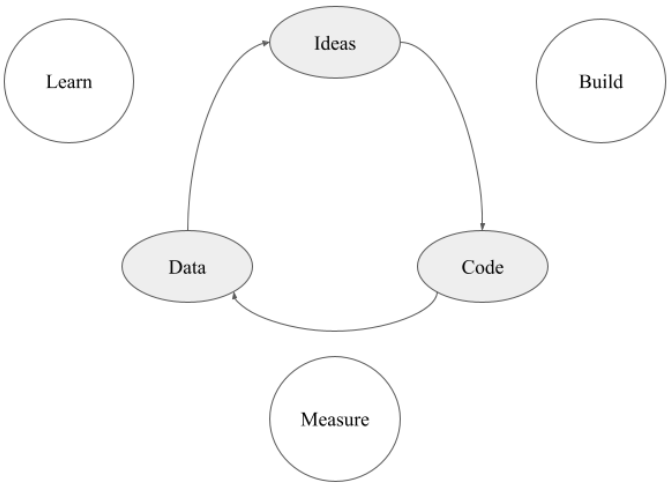

Figure 1: The Build-Measure-Learn cycle (adapted from Croll & Yoskovitz, 2013, p.xxii)

In contrast to aiming for tight feedback loops and trying to learn what customers want by making small experiments, other entrepreneurial thinkers present a more visionary approach to entrepreneurship (Wiltbank et al., 2006). For example, the concept of definite optimism describes an approach including a positive vision for the future and a concrete plan to reach it (Thiel & Masters, 2014). One criticism of approaches that are too focused on experimentation and too little on vision and long-term thinking is the risk of getting stuck in a local optimum and missing out on global optima.

Optimally, product developers should view requirements and feature requests formulated from early customer feedback as hypotheses rather than truths (Holmström Olsson & Bosch, 2015; Ries, 2011). This implies that they should be continuously validated by collecting customer feedback and tested also after feature implementation. Doing so contributes to finding out not merely what customers say they want but rather what they use. This includes finding out what customers claim to want but are not willing to commit anything for, but also what things customers do not yet know that they want. This is important since many of the features implemented in software products are not used at all, not as much, or in the same way, as expected (Holmström Olsson & Bosch, 2015).

These findings in the literature indicate that the experimentative and transformative approach described above could generate better outcomes in combination by switching between the transformative and experimentative state. Many authors suggest a focus on qualitative customer feedback early in the product development process and more quantitative methods later (Croll & Yoskovitz, 2013; Holmström Olsson & Bosch, 2015; Ries, 2011). The development of connected products and business models such as Software as a Service (SaaS) have facilitated continuous development and incorporation of customer feedback (Holmström Olsson & Bosch, 2015). In general, this is truer for software products since these are more often connected to the internet and usage is easier to track in more detail for software products.

2.1.2 Agile and Lean Startup

Some people believe agile practices and Lean Startup are synonyms while others think of them as mutually exclusive. However, as argued by the literature, they are complementary (Bosch et al., 2013; Yau & Murphy, 2013). Agile development is a set of principles for software engineering, focused on customer-centric product development with frequent deliveries (Beck et al., 2001). Lean Startup

includes agile practices and concepts but is not limited to or dependent on those (Yau & Murphy, 2013). When interviewing nine Swedish software startups, all familiar with and using agile methods for product development, a group of researchers found out that not everyone was familiar with the practices of Lean Startup (Bosch et al., 2013). Furthermore, companies that were familiar with ideas from Lean Startup found them hard to implement in practice. This resulted in teams working with agile practices internally, without engaging sufficiently in user interaction to receive feedback and to formulate and validate problems. The group of researchers found that more radically innovative companies were better at doing this than companies imitating other existing business models (Bosch et al., 2013). The companies in the study had all pivoted several times but showed no pattern or systematic way of finding out when to pivot. In many of the companies, there were problems related to pursuing multiple product ideas simultaneously, as well as knowing when to move certain ideas forward while abandoning others. Not only might agile practices be insufficient to build successful companies, but some also argue that they are inappropriate for early-stage startups since they entail too rigorous processes intended to solve problems that startups might not yet have (Yau & Murphy, 2013). While agile methodologies include taking decisions based on customer preferences and specifications, this is mainly based on acceptance tests designed by the development team. In contrast, Lean Startup is more focused on learning about the customer through continuous product deployments, testing, and iterations. On a general level, agile practices are mainly focused on the actual product development, while Lean Startup has a broader focus on the whole firm, including business development and product management. Lean Startup focuses on a lean business development process through minimizing wasteful efforts in all parts of the company, including parts of agile practices if they show to be not necessary (Yau & Murphy, 2013).

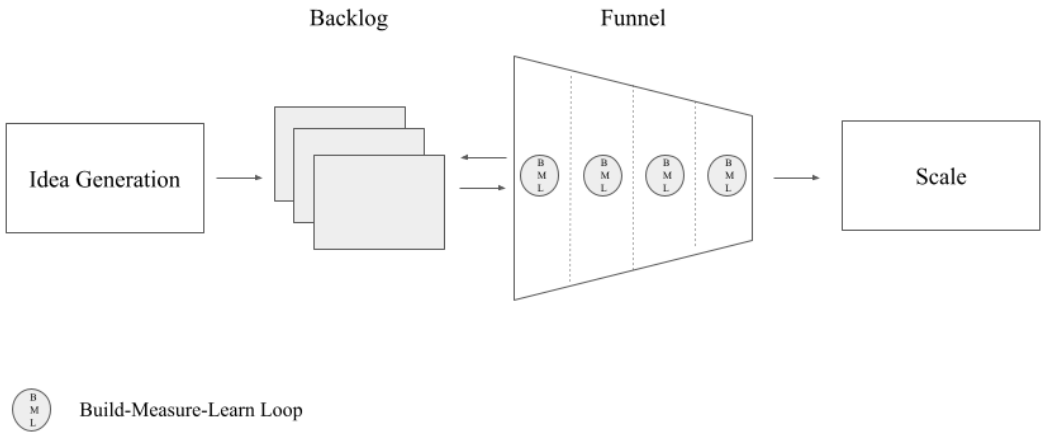

Figure 2: An extended Build-Measure-Learn model (adapted from Bosch et al., 2013)

In the literature, there is a suggested extension of the Lean Startup framework for software startups to help overcome the problems with practicing agile but not Lean Startup methodology (Bosch et al., 2013). The framework shown in Figure 2 consists of three steps. First, idea generation consists of producing ideas of products and features, based on communication with users and internal discussions. Second, a prioritized backlog is collecting all ideas through assessing the importance and potential of the ideas, both to users and the own team. Lastly, the ideas from the backlog go into an implementation funnel, in which they go through the Build-Measure-Learn process advocated in Lean Startup (Ries, 2011). This framework, incorporating user feedback and perspectives at all stages, is arguably mitigating the problems experienced by startups practicing agile but not lean startup principles (Bosch et al., 2013).

To enable a product development process including agile methodologies as well as a Lean Startup (Ries, 2011) approach to building a company, many companies try to organize with flat hierarchies and with cross-functional teams. Spotify's organizational structure (see Figure 3) has become a role model for many startups, centered around a type of small team called squad (Kniberg & Ivarsson, 2012). The organizational model centers around these squads, consisting of groups responsible for a certain set of functionalities. The squads have full ownership and responsibility for their goals and objectives. To support the squads, the organization also includes so-called chapters, including people with the same role from different squads that might need to collaborate and share knowledge on various matters. Each squad has a product owner who is responsible for prioritizing product features, whereas each chapter has a chapter lead focused on technical excellence within their domain. Squads and chapters working on related systems belong to the same tribe, which has a tribe lead responsible for making the included squads thrive (Kniberg & Ivarsson, 2012). All leaders within Spotify's organization should have a coaching relationship with their colleagues. While many connect Spotify's model with autonomy for squads and employees, they are arguably successful due to a combination of autonomy and accountability, reached by setting clear goals and requirements that each squad must perform toward (Mankins & Garton, 2017). Fostering a culture of experimentation and responsibility is vital to make the model work. Furthermore, autonomy does not come entirely without control. While creative tasks such as designing new product features come with more autonomy, there is encouragement for everyone to optimize and create processes for recurring tasks. Thus, other parts of the business than product development and design often have clearer structures and routines (Mankins & Garton, 2017). Another success factor stressed by those having analyzed the Spotify model is alignment among the teams. While teams have great autonomy and ownership of certain things, alignment to the company's overarching goals is diligently pursued (Mankins & Garton, 2017). Some argue that while both autonomy and alignment are important, they are negatively correlated (Salameh & Bass, 2019). Hence, too much alignment might hinder autonomy and vice versa.

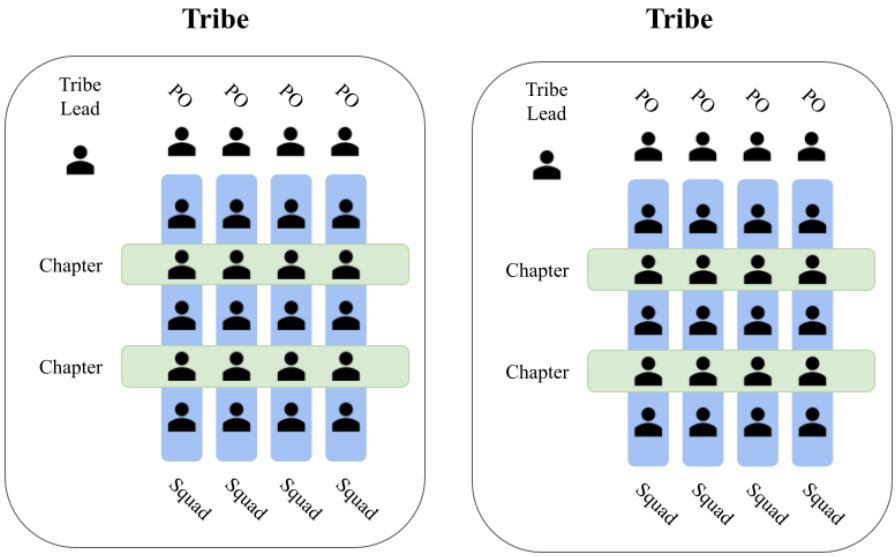

Figure 3: Spotify's tribes (adapted from Kniberg and Ivarsson, 2012)

Many of the ideas in Spotify's model builds on the ideas of Agile and Scrum (Kniberg & Ivarsson, 2012). Scrum is a framework for implementing agile work methods, incorporating several useful tools and processes to employ in all stages of development, ranging from planning to execution and lastly evaluation (Schwaber, 1997). A central component of scrum is the so-called daily scrums, which constitute daily meetings for every team. These meetings intend to facilitate communication within the teams, to resolve issues and dependencies as quickly as possible. Optimal meetings should be short, around 15 minutes. It is important to neither spend time on reporting performance nor to solve problems during the daily scrums. Rather, individuals that find out they need to collaborate on solving an issue during a daily scrum should break out in a separate session to solve them separately. While scrums are often consisting mainly of software developers, the agile mindset emphasizes having daily interaction also between businesspeople and developers (Beck et al., 2001).

2.1.3 Startup Analytics

The Lean Startup (Ries, 2011) method is the basis and inspiration for many other frameworks and concepts such as Lean Analytics (Croll & Yoskovitz, 2013). The Lean Analytics method consists of three steps (see Table 1): (1) defining or identifying the business model of the startup, (2) identifying and being honest about which stage in the startup journey you are at, and (3) use the first two steps to find the One Metric That Matters (OMTM) for the startup right now (Croll & Yoskovitz, 2013). It is important to view metrics and targets as non-permanent lines in the sand rather than permanent and carved in stone due to the volatility and uncertainty inherent in the startup context (Croll & Yoskovitz, 2013).

Table 1: The Lean Analytics Method (Croll & Yoskovitz, 2013)

Step 1	Define and identify the business model of your startup
Step 2	Identify which stage in the startup journey you are at. It is important to be honest about this and not overestimating the maturity of the startup. There are several frameworks and models to divide the startup journey into stages (see Table 2 for an example)
Step 3	Use the business model from step 1 and maturity stage from step 2 to find the One Metric That Matters (OMTM) for your startup right now.

The stages of Lean Analytics are reminiscent of a stage-gate model with stages identifying the maturity of a startup and passing criteria for the gates (Croll & Yoskovitz, 2013). This is useful in the second step above when identifying at which step in the startup journey a certain company is. Table 2 describes the stages and gates in this framework.

Table 2: The Stages of Lean Analytics (adapted from Croll & Yoskovitz, 2013, p.53)

Gate: A problem is found for a customer segment that currently has no or bad alternatives to solve this problem.
Stage 1: Empathy
Gate: The proposed solution is appreciated by customers, and they see value in it.
Stage 2: Stickiness
Gate: The product or service is good enough for users or customers to keep using it
Stage 3: Virality
Gate: User growth is not only paid or manually achieved but also organic
Stage 4: Revenue
Gate: A profitable, scalable business model within a good customer segment and industry is found
Stage 5: Scale

One of the core ideas from the analytics branch of Lean Startup is the idea of the OMTM (Croll & Yoskovitz, 2013, p.55). Some of the reasons for advising the choice of an OMTM are that it helps the company to keep the focus on the thing that matters the most, that it forces the company to set targets that everyone can hold themselves accountable for, and that it enhances an experimentative culture focused on trying out different ways to improve the metric. However, it is important to keep in mind the mindset of lines in the sand instead of carvings in stone. This means that neither the OMTM nor the targets should be permanent but rather change as the company develops or as new circumstances arise (Croll & Yoskovitz, 2013).

Data-oriented practices within product development are divisible into three different but complementary categories: data-driven exploration, data-augmented ideation, and data-informed validation (Werder et al., 2020). Data-driven exploration is undirected attempts to detect patterns in data. This approach means using data analysis as input into the design process but not vice versa

(Werder et al., 2020). On the other end, data-informed validation is the practice of generating hypotheses and testing these against observations from existing data or new experiments. That means that the design instead becomes an input into the data analysis process (Werder et al., 2020). In between these, data-augmented ideation is a practice concerning the interplay between the data analysis and design processes (Werder et al., 2020). It means combining design expertise and data to get insights and build or design products. The definition of design used here is the artistic process which by default does not include any substantial input of data (neither qualitative nor quantitative) from customers (Werder et al., 2020).

Although causality is hard or impossible to prove statistically, randomized trials are one of the best ways of attempting it (Spiegelhalter, 2019, p. 119). While the randomized trial is an old scientific method, commonly used within medical research, it is nowadays used in A/B testing of websites and applications. Many online businesses use such methodology due to the large samples available, as well as the ability to make product changes quickly (Spiegelhalter, 2019, p. 107). Isolated A/B testing is a way to do data-informed validation. A data-augmented process would instead use an iterative approach with series of A/B-tests using the results of one test to design the next one. Deductive methods rely on logic to make certain conclusions based on given, general rules. Inductive methods do instead use studies of particular instances to generalize and draw conclusions about the general (Spiegelhalter, 2019, p.76). The big difference is that deduction is certain in a logical sense, while induction generally is uncertain (Spiegelhalter, 2019, p.77). Since statistical methods involve engaging in inductive inference, a great deal of work relates to questioning how generalizable the conclusions of a statistical experiment can be. However, in practice, induction and deduction do not exist separately. All observations are "theory-laden", and theories are fundamentally based on observation or experience (Deutsch, 2011). This means that these two modes of thought and reasoning will always interplay, and pure data-driven methods are not only rare but also insufficient (Deutsch, 2011). The problem with relying exclusively or excessively on induction and data-driven methods is that it builds on the assumption that "the future will resemble the past". In reality, and especially for startups, this is generally not true. For a startup to achieve growth and proceed into a state in which the company is larger and more profitable, the future in the case of success will be different. This means that pure induction (i.e., extrapolating the past onto the future) will be insufficient.

2.2 Network Businesses

Network businesses in general, and online communities in particular, are subject to network effects. Furthermore, to build a community with different groups of users depending on each other's contributions, it is important to understand incentive structures in communities. The first part of this section describes the literature on incentive structures from some of the existing and successful online communities. The second part describes the characteristics of network effects and strategies to build and trigger them.

2.2.1 Online communities and incentive structures

There are many types of online communities, ranging from forums such as Reddit to knowledge-sharing platforms such as Wikipedia. One general definition of online communities is: "an aggregation of individuals or business partners who interact around a shared interest, where the interaction is at least partially supported and/or mediated by technology and guided by some protocols or norms" (Porter, 2004). Similarly, professional online communities are "...groups of people who share a concern, a set of problems, or a passion about a topic, and who deepen their knowledge and expertise in this area by interacting on an ongoing basis" (Antonacci et al., 2017). Even though several definitions exist, most focus on the key role of social interaction, learning, and/or knowledge sharing.

Three macro-level aspects stand out as affecting participation: individual factors, technological factors, and social factors (Antonacci et al., 2017). Individual factors include community members' characteristics, such as motivation, personality, and values. Technological factors relate to the usability of the community platform, and social factors relate to group processes and roles within the community. Individual factors include reward systems and other structures of the community. Such systems must be deeply adapted to the specific context. Rewards can turn out to work in the wrong direction if implemented in the wrong context. For example, the SAP community showed that rewards can negatively affect contributions to professional online communities (Fahey et al., 2007). Research on open-source software communities shows that individuals contribute voluntarily to software development to learn, find employers, and enjoy challenging tasks. However, a big part of successful open-source communities is contributions and moderation from founding organizations, which are often large companies (Lerner & Tirole, 2002). As for the social factors, research shows that central members contributing extensively to a community have a strong impact on the other members (Antonacci et al., 2017).

A simple language, including as many members as possible into the discussion, has shown a positive impact in the medical domain specifically (Antonacci et al., 2017). Analysis of professional online communities specifically has shown that willingness to share knowledge, high-quality content, diversity of views, technology, relevant discussions, a respectful environment, and rapid response to members' questions might determine the success of the communities (Hew, 2009). Different constellations and implementations of online communities work well in different contexts, why it is important to understand the domain and users before deciding on design specifics.

Active participation is crucial for creating strong online communities, why much research focuses on analyzing active participants and an active-passive dichotomy (Malinen, 2015). However, the various types of users of online communities are heterogeneous, which calls for a more fine-grained categorization of users. For example, more passive users, often called lurkers, are divisible into passive consumers, interactive consumers, and active consumers, depending on how they are using a platform (Malinen, 2015). In general, only a small number of users contribute content to online communities. Many users are only entering the community to view content. Lurkers can still be regular users of the platform and might not produce content for various reasons (Nelson, 2020). One reason might be that they do not have a practical need of contributing, and rather get all the value they need solely by viewing other users' content. They might also be in an activation stage, in which they are getting to know how the community works. A third possible reason is social fear and worries that questions and answers are perceived as dumb.

On Stack Overflow, a minority of the users produce most of the content. The frequent contributors are divisible into frequent, low-quality providers and less frequent expert providers (Yang et al., 2014). In the case of StackOverflow, the frequent providers are quantitatively interesting because they produce large amounts of content (Yang et al., 2014). Less-frequent experts exhibit a usage pattern more like a regular (passive) user but produce content of more utility. Another problem with analyzing users with a passive-active dichotomy is that both states are often transitory, as well as hard to clearly define. Most efforts to segment users in this way consist of quantitative measuring, which requires numeric rules to determine the segments. This way, subjective aspects such as a feeling of belonging to the community, which could be present within all user groups, are not captured (Malinen, 2015).

While Stack Overflow is open for everyone to participate in, contributing users are often skilled programmers. Many use the platform in their everyday software development work. One explanation of why many users contribute heavily is the extrinsic incentives created through gamification elements such as reputation points and voting systems (Mamykina et al., 2011). Another extrinsic motivator is

that responses on StackOverflow can function as a portfolio for individual developers, which have shown to be an increasingly important asset when applying for new jobs (Faraj & Johnson, 2011). Beyond gamification, continuous improvements based on user feedback might have gained the platform an even stronger position. With a meta-forum as a primary feedback channel, the voice of the customer is easily incorporated. Not only is user feedback important for improving the platform technologically, but StackOverflow also leverages content moderation carried out by users through a voting system, ensuring that content is in line with what users wish for. While the StackOverflow team were strongly active users themselves in the early days of the platform, user-led content moderation has become more important as the platform has reached a larger scale (Mamykina et al., 2011). To repeat the success story of Stack Overflow, platforms must create a corresponding incentive system. While this might seem straightforward, it is not obvious that all elements in the gamification of Stack Overflow can have analogs in other contexts, nor that extrinsic motivation would be the main driver of participation. In research focused on various professional forums, it has become clear that perceived professional development is an important cornerstone of active participation. Not least, a community of professional nurses found the major usage areas in getting help with problems as well as validating their practices (Hew, 2009).

2.2.2 Network effects

A network effect exists when the value for users of a product or service increases or decreases with the number of other users or usage of the service (Katz & Shapiro, 1985). There is an emerging trend of data network effects for which the network size is no longer the main source of the network effects and increased utility for the participants in the network (Gregory et al., 2020). The main drivers of this trend are progress in AI and increases in the scale and scope of available data. In the early phases of a business subject to data network effects, it could be useful to have the future potential to leverage data in mind even though it might be too early to leverage AI from day one.

In addition to the data network effects, the view on the size as the main determinant of network effects is further deemphasized when adding two groups of contextual factors that determine network effects: structure and conduct (Afuah, 2012). The structure of a network includes factors such as centrality and the number of possible connections while conduct includes trust and effects from reputation within the network (Afuah, 2012). These two factors partly determine the additional value of adding participants. For example, more possible connections and a higher value of building a reputation within a network both mean that the value of an additional network participant increases.

From a practical point of view, it is difficult for the entrepreneur to measure the strength of the network effects before reaching a critical mass (Croll & Yoskovitz, 2013, p.218; Jorgenson, 2015). In cases where the utility derived from network effects make up a substantial share of the total value of the service of the product for the user, it is therefore hard to test the value proposition early on (Croll & Yoskovitz, 2013, p.218; Jorgenson, 2015). This creates a catch 22 situation where you need an MVP to build a user base but a user base to build the MVP since the network itself is part of the MVP. (Jorgenson, 2015) mentions three ways to overcome this catch 22 situation: find a narrow niche and create network effects within it, create a stand-alone value beside the network effect, and what he calls “fake it till you make it” through doing things that do not scale.

While network effects can eventually lead to rapid growth and market dominance, the initial growth of platforms can be very slow before the triggering of network effects. Some argue that network effects causing rapid growth is in a way a misconception that comes from businesses and products getting attention at first when growth takes off (Goldenberg et al., 2010). In the early stages of a product prone to network effects, it might be wise to deliberately grow slowly, as several examples of company failures have come upon scaling too fast without proper product-market fit (Hagiu & Rothman, 2016). Focusing on creating immense user value for a few users within a niche could help create sustainable growth and thereby network effects in the long run. However, knowing that more users increase the value of a platform when network effects are in play, having the diffusion of the service go as quickly as possible is another strategy to reach product-market fit more quickly.

3 Method

This chapter consists of two parts. First, a description of the method used in this study, and second, a brief discussion of the strengths and weaknesses of the chosen method.

3.1 Method description

To answer the research questions stated in the introduction, a case study was conducted. As a part of the company's team, the researchers engaged in participant observation. Thereby, the researchers could closely follow the issues and considerations, as well as the outcome of various strategic actions. Participant observation relies on informal, consistent communication to obtain information that otherwise would be hard to get, which raises concerns about the methodological rigor (Iacono et al., 2009). Through researching user data, collaborating closely with the company, and keeping extensive notes in a structured way, a well-defined picture of the company's situation was achievable. The researchers were participating both actively and through passive observation at the core of the case company and had access to all individuals in the management team when working alongside them as well as during more formal interviews as described below.

3.1.1 Data collection

The main part of data collection took place during operational and strategic discussions and work tasks. By participating, the researchers collected qualitative data about the case company, covering both the current situation and the strategy for the future. Through taking notes during the discussions involving the researchers, the material was easily surveyed during analysis. Furthermore, semi-structured interviews with key persons from the company confirmed and complemented the observations (see interview templates in Appendix). In addition to this, quantitative data about the company's products and the usage of these were analyzed to get a better understanding of the current situation of the company.

Table 3 below gives a summary of the data collection. After the table follows an elaboration of the contents of each part of data gathering. In total, time in meetings with active participation from the researchers summed up to 55 hours. Additionally, meetings with passive participation totaled 20 hours. Interviews amounted to 4 hours, and the time spent on analyzing quantitative and qualitative data (see other data collection in Table 3) from the company amounted to 260 hours. In total, the two researchers thus spent 339 hours each collecting data about the company.

Table 3: Summary of sources used in data gathering

Recurring meetings		
Before organizational change		
Full team meetings (monthly)	1 hour x 2 events	Passive participation
BI meeting (weekly)	1 hour x 12 events	Active participation
Meetings with commercial and operations team (weekly)	1 hour x 12 events	Active participation
Operations meetings (weekly)	1 hour x 10 events	Active participation
After organizational change		
Full team meetings (weekly)	1 hour x 4 events	Passive participation (although helping with data visualizations)
BI meeting (weekly)	1 hour x 4 events	Active participation
Squad standup meetings (two times weekly)	15 min x 8 events	Active participation
Operations meetings (weekly)	1 hour x 4 events	Active participation
Other meetings		
Meetings with CEO/co-founder	3 hours	Active discussion
Meetings with CFO/co-founder	2 hours	Active discussion
Meetings with Product Manager	5 hours	Active discussion
Meetings with CTO/co-founder	5 hours	Active discussion
Formal interviews		
CEO/co-founder	1 hour	Semi-structured interview
CTO/co-founder	1 hour	Semi-structured interview
Product Manager	1 hour	Semi-structured interview
Domain expert/co-founder	1 hour	Semi-structured interview

Other data collection	
Analyzing BI data	The researchers spent three months with the responsibility to analyze and present usage data from the company, as well as planning the initiation of A/B-testing product features
Access to the product	The researchers spent time studying the company's product on a weekly basis, obtaining a good understanding of its features, strengths, and weaknesses
Access to information, documents, meeting documents, product roadmap, etc.	The researchers took part in meeting notes from user board meetings, previous results from market research as well as documentation of the company's plan for the short- and long-term future.

During the project, an organizational change resulted in two different sets of meetings over two different time periods. The researchers thus had the opportunity to evaluate two different ways of organizing and communicating internally. In the full team meetings, mainly the managers and founders of the company spent time explaining the status, priorities, and strategy of the company. The researchers participated mainly passively and obtained clear information about the evolving high-level strategy of the firm. Before the reorganization of the firm, the researchers participated in weekly team meetings including the operations and commercial teams. After the reorganization, squad meetings involving a new type of cross-functional team replaced these meetings. In both types of meetings, the managers of the teams led the agenda, and the researchers participated mainly passively but responded to questions regarding their responsibility area within data and analytics. After the reorganization, the researchers also participated actively in two weekly standup meetings with their squad, which consisted of discussing daily priorities and obstacles. Since the researchers worked with improving the company's BI stack and processes, they also had weekly BI meetings with the CTO and the Product Manager. These meetings were highly interactive, including advice from the researchers on BI matters as well as discussions about the product development processes within the firm.

Furthermore, the researchers had the opportunity to engage in ad-hoc meetings with several of the managers and founders, for the sake of helping with BI strategy, giving input on business strategy as well as preparing material to present both internally and externally. Throughout these conversations, a well-defined picture of the founders' initial business idea, as well as the strategic challenges and decisions they face emerged. Even though the researchers could refine the company's situation throughout both recurring and ad-hoc meetings, the final semi-structured interviews verified observations and filled in gaps. This way, the results could be quality-checked yet another time, ensuring the elimination of any misconceptions. Lastly, the researchers learned about the business through accessing and analyzing usage data, the product itself, as well as documentation of meetings and market research previously conducted by the company.

3.1.2 Analysis of collected data

To compile the results from participant observation, the document with notes from each discussion that the researchers participated in was thematized and structured in coherent, workable topics. This happened in two iterations, in which the first consisted of generating labels for each topic through surveying all data, and the second of sorting the data into the most appropriate topics. After this, statements and opinions from different persons on the same topics were gathered in the same place. Thereby, the researchers could easily identify interesting topics that many highlighted problems with, as well as topics where opinions were diverging, and where unclarities and gaps in the collected data existed. To handle the last part, the researchers compiled a set of clarifying questions for four key persons in the company during the previously mentioned semi-structured interviews. This sorted out unclarities and the researchers could get additional, more profound information on particularly interesting topics. The semi-structured interviews resulted in an additional set of data that the researchers surveyed with a triangulation approach. Comparing the resulting information across the various interviewees, as well as against the previously surveyed data from meetings, helped narrow down the focus on some key areas covered in the analysis.

After compiling all data from the results section (see chapter 4 for a summary), the researchers analyzed the case company with help of the literature framework. The examination of the literature and results parts followed an iterative approach. In the first iteration, the researchers identified connections between the results and the literature, e.g., similar issues or opposing views on topics. The second iteration consisted of sorting these connections into three different strategic levels to enable a coherent analysis of issues in relevant strategic areas. Specific focus was also put on analyzing the company's practices compared to methods and best practices included in the literature framework. The analysis yielded insights into the tradeoffs, problems, and considerations that a company in a situation like that of the case company must handle. These three strategic levels build the structure of the discussion in chapter 5.

To extract the findings of the project into something useful for practitioners, the researchers compiled the major findings into a checklist (found in the concluding section 6 of the report) for startups pursuing a multi-business strategy. The checklist is entirely prescriptive and intended as a go-to for strategy makers at early-stage ventures with multiple business areas. It aims to help direct focus to some critical problems and considerations, guided by the analytical findings (presented in the discussion in section 5) of this report.

3.2 Method discussion

One limitation of the chosen method is that the study only consists of one case. This could limit the generalizability of some of the findings. The case company is operating in a heavily regulated and specific industry, thus encountering problems and decisions that might not be present in other industries. Also, the fact that the company's product is a platform creates synergies, which may not be as prominent for other startups. Furthermore, the organizational context described in the report is to some extent specific for this company. However, the change from one organizational model into another happened during the study. This organizational change enabled the observation of differences between these two organizational models. Although these contextual factors are unique for the case company, the literature supports many of the problems and phenomena identified. This study can serve as an exploration into an area not extensively studied before concerning startups, i.e., multi-business strategies. It is important to note that the case company's strategy is evolving, meaning that their practices in a certain period might not remain throughout their whole entrepreneurial journey. More changes will certainly occur in both the company and its environment, meaning their strategy might evolve in new ways or change dramatically. The tradeoffs and issues encountered in the company during the project might, regardless of the strategy, be particular to the current stage of the company, and therefore not be generalizable even for other stages of the same firm.

The interviews and other meetings have not been recorded or transcribed. This was a deliberate choice together with the case company in response to privacy and secrecy considerations. This also enabled more data collection since the researchers did not have to transcribe the vast amounts of data collected in this study. However, this poses risks for biases and misinterpretations. This was, as mentioned above, managed by first collecting a lot of observational data about the company and then validating this with more formal semi-structured interviews.

The researchers have been part of the company's team which poses a risk of biases and blind spots. This has been handled by separating the roles of active and passive observation but also insider and outsider perspectives (see Table 3 for details on the different forms of data collection). The researchers' efforts to structure the collected data enabled the analysis and evaluation of which areas were most interesting, conflicting, and worth digging deeper into. Other researchers with different competence areas and interests could have directed the focus of the analysis to other areas. Therefore, the issues covered in this project are not completely exhausting and could potentially cover more areas.

4 Results

This chapter consists of the findings from observing the case company. The structure is around the core topics identified and ordered as follows: First, a description of the company and its strategy (4.1). Secondly, a more detailed description of the open collaboration platform (4.2). Thereafter, a presentation of the product development process of the company in general, and the open collaboration platform specifically (4.3). Lastly, we cover the new organizational structure introduced by the company (4.4).

4.1 Company description, vision, and strategy

The company has built a platform for online collaboration for researchers and practitioners. Within the company, there is a lot of experience from the healthcare industry. Primarily from sales roles, but also from practitioner roles within the industry. Both the commercial and development teams have experience from larger organizations. There are also domain experts with a deep understanding of the user base in the company. According to the CEO, the business model is a two-sided platform. The supply consists of expertise and 3rd party plugin providers of AI tools, whereas the demand is organizations with researchers and practitioners, wanting to access the expertise and collaboration possibilities of the platform. The founding team sees many potential business opportunities for the platform and has difficulties selecting one single area to prioritize. Therefore, as of today, the company has divided its business offering into three business areas: Workspace, Education, and Research. The business areas rely on the same technology platform, even though the newest business area, Research, is currently undergoing additional, specialized development to fulfill the needs of customers. The rationale behind pursuing these development efforts in parallel with other efforts is that when completed, the new research product will unlock a new market of companies in need of structuring their research data. Furthermore, the development project runs together with a strategic partner, ensuring both a limited downside financially and a source of domain expertise. According to the CTO, this partnership proves that there is at least one future customer interested in a product like this which means that the demand was at least partly proven before the development started. Also, the CEO views a broad range of offerings as positive to enable sales strategies with different entry points and a potential to broaden the customer relationship across the business areas later. As of now, most of the development resources work in the Research business area. Therefore, limited resources are available for the other business areas.

The Education area builds on letting organizations use the platform for hosting courses and other events on the platform. For the Workspace business area, the company focuses on providing a cloud collaboration platform for specialist practitioners. The founder team has experienced that the product has a standalone value for organizations, in which they can collaborate in closed groups and structure their data. The company managers see a range of new possibilities opening with the expansion of the installed user base in the form of organizations, including providing expertise from the network in a marketplace setting and enabling more open collaboration on the platform. Within the Workspace business area, a free, open version of the platform is also included. Anyone that is a verified practitioner can sign up for the free service, which enables the user to connect and collaborate with everyone else on the platform. In contrast to the paid service, which the company sells to organizations, the main difference is a less convenient method of uploading cases and limited usage of certain functionalities. In the long run, the CEO hopes that a sufficiently large user base in the open community will create immense value through network effects, thereby growing the company and giving it a larger footprint for selling its paid solution through efficient, organic growth. The Workspace business area and the open collaboration platform specifically is as mentioned where the researchers were a part throughout the work with this report. That is why detailed information about

processes and practices in the company will mainly come from this business area, elaborated on in section 4.2.

4.2 The open collaboration platform

From communication with the founding team as well as following along with company-wide meetings, it has become clear that the main objective right now is to add revenue by selling the collaboration system to organizations. Over time, the team thinks the open collaboration platform will gain greater importance. Since the company must verify users, the platform is not completely open in the sense that anyone can view the content or get registered within minutes like in many other online communities. When accepted to participate, they can share cases and discuss them in a setting like that of online communities such as Stack Overflow. Technically, the major difference is that this platform has specific functionality that enables sharing the specific type of information processed in this field of practice. The company sees that the potential of the open collaboration platform is to create a large network of specialists that can help each other solve problems, develop professionally, and discuss interesting cases. The company thinks that the open collaboration platform has great potential but views it as different from the SaaS package they are selling to organizations today. While the SaaS model has similarities with services as Dropbox or Google Drive, the open platform is more of a professional online forum. However, the underlying technical platform is the same with small variations for both offerings.

As of today, the open platform has not gained widespread adoption. When studying usage data, it became clear for the researchers that the user retention of the open platform is low. Most users who try out the platform drop off within weeks. However, a small number of recurring users contribute heavily to the community. The CTO, Product Manager, and an employed domain expert all agree that though the potential values are clear to themselves, it is not obvious if the typical user understands them when entering the platform today. Several company representatives are aware that the users of the platform might have an incentive structure that they do not yet completely understand. An employee with domain expertise states that one core problem now (supported by user conversations and feedback from frequent users) is that the platform is a bit hard to understand, that some of the desired actions are unclear, and that the value for users of taking the actions is not obvious. Several managers and founders agree on this problem and are prioritizing efforts to make the platform easier to understand.

A co-founder who is a domain expert thinks that it might not only be features and technological improvements that are affecting the usage negatively, but also factors such as motivation, incentives, and the pre-existing social structures within the community of practice. For example, the team debates internally whether practitioners are reluctant to provide their medical expertise to the community without getting compensated. The company has no coherent picture of which incentive structure is best suited for the platform. Several people in the company with experience from the industry point to strong hierarchies and reporting lines within the medical subdomain. Junior practitioners might be reluctant to interact out of fear to step out from the hierarchical structures. Others might be afraid to do something wrong that can damage their reputation. These are examples of theories that the company has derived from their own experience as well as feedback from their so-called community board, introduced in section 4.3.

4.3 Product development process

The CTO explains that when establishing the company, the first step was to validate the founders' problem hypothesis. The founders believed that practitioners and researchers in the specific medical field had trouble storing and efficiently structuring their data and that they were lacking a natural place for asking for help when encountering difficult cases. Initially, they validated this hypothesis by interviewing potential users in the founders' network as well as sending out a survey to professionals that received over 100 responses. After this research effort, the founders decided to move on and build an MVP. The company built the MVP in collaboration with a development agency. The founders included features in the MVP based on their experience and knowledge, coming from roles at various major corporations. In retrospect, the CTO thinks it could have been beneficial to include potential users in the feedback loop also during the MVP-building process. The MVP resulted in a product that the company could show and pilot to some initial users, even though it suffered from many bugs and technical debt. The CTO believes this is typical for startups that do not want to spend too much time optimizing a product for robustness if they might discard it later, even though keeping such a product and making it robust later is a very demanding process.

To launch the product, the team deployed the MVP in three stages. First, they let in a group of users they were so close with that they knew they would receive feedback and a positive attitude. Secondly, they let in the second group of users that were not as close, potentially being negative to the service but anyway most probably giving valuable feedback. Lastly, they welcomed all professionals to join the platform. The reason for having the launch divided into these stages was to reduce the risk of creating a negative attitude toward the product among users, which the founders thought could be long-lasting and hard to change in the future. Once the platform opened for all users, they needed new methods for gathering user input, even though such have not fully come in place yet. Methods such as Net Promoter Score and analyzing the tracked usage data of the platform are thoughts that the CTO has on how to gain insight in the future. However, up until this point, mainly informal talks, often in connection with sales efforts, have generated feedback. Furthermore, the company has established a so-called community board, consisting of enthusiastic and experienced users gathering continuously to discuss the platform. To compile ideas on improvements and new features on the platform, the product manager keeps a list of features that stakeholders have requested or that internal discussions have generated. He arranges ideas into the various business areas (Workspace, Education, and Research), even though they all rely on the same technical platform. The list contains over 100 features of various commercial and technical value and complexity, making the prioritization process complex and demanding.

When deciding on which features to implement, the team gathers various key individuals in the company, including the product manager, CTO, and CEO alongside others in the founder team. Together, they aim to develop a prioritized feature list for implementation on a monthly or quarterly basis. Several individuals in the company described that this process until now has happened on an ad-hoc basis, and through consensus as the decision mechanism. The team recognizes that this process is time-consuming and that it adds additional steps to the decision process that is not necessary for all features. Several people within the company claim that the process thus far has been subjective and based on gut feeling and that the team lacks competence and processes within the area of prioritizing more objectively among features, which is why they are looking to hire an experienced product owner soon. The new hire is sought to be someone that can help educate other members of the team in the practices of product ownership.

Up until today, the company rates the benefit and cost of features and ideas based on two dimensions, business value, and technical complexity respectively. Both are grades on a three-step scale and used as a foundation for discussion. The commercial team assesses business value, whereas

the CTO appreciates technical complexity. The sole responsibility of the CTO to evaluate technical complexity is due to the CTO being the only individual in the management team with software development knowledge, whereas the rest of the management team specializes in sales and business development.

In the prioritization meetings, the team synthesizes ideas from the long list into a less granular product roadmap that consists of bigger work packages assigned to individual developers to work on. According to the CTO, the product roadmap is a communication tool internally and towards investors, which is a bit more high-level than the product backlog or feature long list.

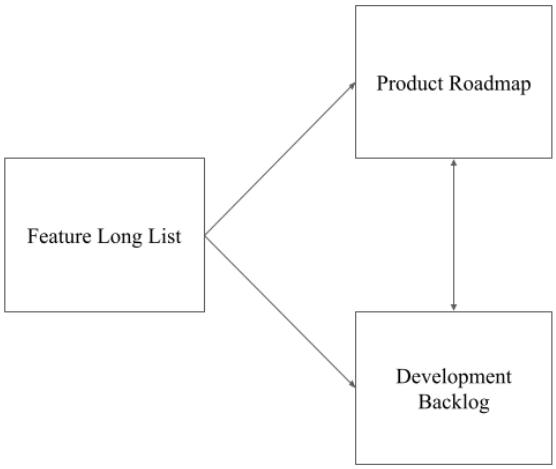

Figure 4: Illustration of the case company's feature prioritization process

During the planning meetings, occurring about every month or six weeks, the team updates the product roadmap. They schedule developers to work on certain features over as much as a quarterly period. While the schedule leaves little time for flexibility at the time of planning, the team reworks it as problems arise and customer deliveries need to occur. This happens around every week within the development team led by the CTO.

The CTO describes how features, after prioritization, end up in the developer team's backlog, consisting of a Kanban-board in GitLab. It is the developer team's responsibility to carry out and reprioritize the features once they enter the backlog. Since the company has very limited resources overall due to the large development project, they can leave little time unscheduled, giving developers a near 100% time-allocation at the time of planning. For the open collaboration platform, having been set aside as the main focus, this means developers are often fully busy, with a lot of time concerned with resolving old and new bugs. Once the ream implements a feature, the developers test its technical feasibility by carrying out acceptance tests designed by the developers themselves. After deployment, there is no evaluation of the new features besides input coming in from talking with users in general. However, the company strives to start working with A/B testing of new features in the future.

4.4 Future strategy and new organizational model

The current focus for the open platform is, as explained by the CTO and Product Manager, to start accelerating growth by adding and activating new users. One part of achieving this is becoming more data-driven through setting up processes for analyzing data and making experiments and tests on the platform to get insights on what to do to grow activity on the platform, primarily by making it stickier and activating new users. One problem that several team members mention is the difficulty of differentiating between operations and getting new users on one hand and improving the product on the other hand.

Until now, the company has moderated the open platform. As an example, a lot of posts are being shared via email to get more traction. These are typically cases deemed interesting by the company team, which are then emailed to a big number of users who might be in the right field of interest. More recently, the company has initiated efforts to get more help from the user base. The primary example is the community board gathering regularly to discuss the platform. From these meetings, the team hopes that constructive feedback will arise, enabled by the perspective of the experts that have a strong belief in the platform. There are many persons directly or indirectly connected to the company with big international contact networks within the domain. The employed professionals with domain knowledge, alongside the community board, come with feedback of varying granularity, ranging from how to focus the value offering, to designing landing pages and arranging events. The group is conscious about the whole context of the platform and pays attention not only to technical features but also to regulatory and ethical questions as well as the tonality and actions of the community on the platform.

The company also hopes to find helpful insight by analyzing user data in a more structured manner. From the inception of the business, they have carefully sought out to track the usage pattern on the platform, recording a variety of events in a database. Through searching for patterns in this data, they believe they can find potential ideas for optimization. They also receive qualitative input from talking to customers and from the community board. As of now, they do not have a system for analyzing and synthesizing these various types of user data. Related to this, the company wants to build dashboards with data visualizations to understand users and activity on the platform better. Until now, the company managers deem their product analytics as well as the KPIs that are guiding the company too basic and failing to provide useful insight.

Since the company's beginning, the business team and the development team have been geographically separated, located in two different European countries. According to the CTO, this has led to a greater need for a structure of cross-functional communication from the outset. Several people say that they see the decision-making process as too centralized and feel that the company is starting to get too big for involving everyone in everything. As the company is now growing rapidly with help of venture capital investments, they have decided to leave their initially functional-based organizational structure, and switch to a cross-functional one based on three squads, an organizational model inspired by Spotify. Each squad contains members from different business functions, including development, operations, and commercial. This is one effort thought to help create tighter feedback loops internally, to improve idea generation as well as to decentralize some of the decision-making as the team grows bigger.

The prioritization of resources between these squads (and earlier between different projects) is on a strategic level done by the founder team. The founders have a long-term vision for the industry and how their product fits into it. One founder mentions that while he believes in the vision and original idea of the company, the market still must mature and understand the value of it. The managers do prioritizations and strategic decisions in the short or mid-term on one hand to get revenue and on the

other hand to build products and a platform that is part of the long-term vision. Important to note is that the allocation of resources between the squads is not a pure trade-off between the business areas. Since they are all built on the same technical platform, synergies from development work exist. There is also an overlap between the business areas in terms of the target customers.

To enable focus, decision-making, and performance tracking within each squad, the management team has decided to use some central metrics as guiding lights for the squads. Inspired by Lean Analytics, each squad has received an OMTM, which they should use as the single most important metric in their current phase. In the case of the so-called Platform squad, within which the researchers resided during the project, the OMTM was the percentage of new users interacting on the platform within 7 days from their first activity.

The squads gather three times every week in short stand-up meetings. The meetings should take off in analyzing the progress of the OMTM, and from there discuss new actions to improve towards reaching a target specified by the team. Initially, the meetings take place through all members reporting what they are currently working on, followed by a discussion if someone wants to raise any issue. People often raise feature ideas and requests on new processes and improvements, which can be immediately evaluated. Furthermore, the meetings have given the operational and commercial side deepened insight into what the developers are working with and how they are prioritizing. So far, the OMTM is not used as “the” metric but rather as one of many, and actions are not always discussed in terms of how they would affect the OMTM or not.

4.5 Summary of results

To conclude the results section, we have compiled a summary of the main themes from the data below in Table 4.

Table 4. Key takeaways from the results section

4.1 Company description, vision, and corporate strategy • The company pursues a multi-business strategy • Most development resources work on a new business area (Research) • The company sees long-term potential in the open collaboration platform, while other business areas are more likely to generate revenue short-term • The team has vast experience from the healthcare industry and large corporations
4.2 The open collaboration platform • The open collaboration platform lets verified practitioners sign up to collaborate with others • Most users drop off quickly after registering on the platform • A small number of users contribute heavily and return frequently • It is not clear what incentive structures should be created around the platform • Some users perceive the platform as hard to understand
4.3 Product development process • The initial product idea came from the founders' experiences from the healthcare industry • The team receives feedback mainly through informal talks with users, as well as from a board consisting of heavy users that gather monthly • The product manager compiles and maintains a list of feature ideas • When deciding on which features to implement, key individuals gather to prioritize, often through consensus and based on experience
4.4 Business strategy going forward and new organizational model • The company wants to add more users and activate a larger share of the new users • They want a more data-driven and experimentative approach to product development • The managers think a reorganization based on cross-functional squads will enable collaboration between different functions • The managers intend to direct the squads' focus with an OMTM

5 Discussion

This chapter consists of a discussion of challenges for the company, encountered while analyzing the case. The discussion aims to analyze the challenges identified (Chapter 4) using the literature (Chapter 2). The chapter is structured in three sections covering strategy (5.1), organization (5.2), and feature prioritization (5.3) respectively.

5.1 Strategy: allocating resources between business areas in a startup

In contrast to the literature about early-stage entrepreneurship, such as Lean Startup (Ries, 2011), the company is pursuing several business opportunities that are not completely mature, rather than focusing wholly on developing and evaluating one at a time. The company has a multi-business strategy with multiple distinct but related business areas. To fully comply with the guidelines of Lean Startup (Ries, 2011), the company should preferably abandon (at least temporarily) all business areas except one, to focus all resources on making it viable, before adding on additional products and business areas. The absolute opposite would be an extremely diversified company, as is common among more mature businesses and conglomerates. It is important to note that these two states: focus and diversification, are not completely binary. Rather, this company shows how a startup might pursue a combination of the two strategies, with a temporarily greater focus on one business area while also operating others. From the founders' perspective, this is a way of finding a sound baseline of recurring revenue, while the open collaboration platform, arguably subject to network effects, is still in its embryonic phase. As seen in the literature review, network-based platforms eventually reaching exponential growth might initially experience long periods of slow growth before taking off (Goldenberg et al., 2010). The potentially strong network effects of users can give a stable competitive advantage since it creates a barrier to entry for new actors (Jorgenson, 2015). Network businesses are hard to build as a single product and building a network as one of multiple business areas in a startup context with limited resources is arguably an even harder challenge. However, succeeding with it would at the same time potentially create larger barriers against competitors.

The Lean Startup movement builds on the idea that the best way to reduce uncertainty and the risk of wasting resources on building things customers do not want is to quickly build MVPs, test them, and learn from the results (Ries, 2011). In an environment with noticeable resource limitations, this stands in contrast to diversification and multi-business strategies since the cycle speed gets reduced through allocating resources among several projects. Diversification reduces the influence of idiosyncratic risks (i.e., risks from specific projects) but not necessarily the systemic risk (i.e., the risk for the whole company). Assuming diversification leads to longer cycle times (due to more constrained resources to each project), the uncertainty about whether customers will use and pay for a product remains and is likely increased for each of the projects as iteration speed decreases. Therefore, the increasing uncertainty within each business area counters the decreased risk from diversification. The magnitude of these two forces is hard to estimate but the fact that the trade-off exists is still an important insight for a startup pursuing a multi-business strategy. The question that remains is what the optimal solution to this trade-off is. Furthermore, the network of users is arguably a complementary asset to the various products the company is offering. This makes a multi-business strategy more defensible due to the relative complexity and difficulty to copy. Competitors cannot just copy one part of the offering but rather must compete with a set of interrelated offerings spanning over the different business areas. However, it makes prioritization and resource allocation harder since different business areas share the same developer resources and prioritization is not only made on product-level but also a company-level. Using a pure Lean Startup approach is harder when focusing on several business areas. This means that for each business area, the strategy may be suboptimal while the overall corporate strategy is less dependent on any specific business area succeeding. Consequently, this strategy is more in line with how larger companies use to work rather

than startups. An important contextual factor is that the management and most key personnel in the case company have experience from larger companies which makes such a strategy both more natural and probably more feasible than for other founder and management teams.

The high utilization of developer resources in the case company stands in contrast to Spotify which has been the inspiration for the new organizational model. Spotify leaves around 10% of the time for experimentation and generation of new ideas (Kniberg & Ivarsson, 2012). Roadmaps for months in the future with an almost perfect load will limit the company's ability to adapt and capture new opportunities for the platform. This means that there exists a tradeoff between resource utilization and flexibility.

5.2 Organization: structuring a startup with a multi-business strategy

The managers think that the reorganization into cross-functional squads, inspired by the organizational model of Spotify (Kniberg & Ivarsson, 2012), will enable tighter communication and collaboration, idea generation, and greater mutual understanding between different business functions. Communication between developers and businesspeople will help facilitate the product owner role, since prioritizing between features has been slow due to information gaps between the two functions. While the ambition is to decentralize decision-making and enable serendipitous idea generation and collaboration on all levels of the company, traditional reporting lines will exist in parallel to the squads. It will be important to ensure that not every decision needs to flow through the hierarchy, but rather that managers embrace a coaching role (Kniberg & Ivarsson, 2012) and that tight control and structure are mainly practiced for repeatable tasks and processes (Mankins & Garton, 2017). It will be important for the company to survey what types of decision-making that do not need discussion at higher levels within the organization, to fully exploit the benefits of this new, more decentralized structure. Relating to the strategy, this kind of organization makes it easier for each squad (especially those in the early stages of product development) to work in a more conventional way inspired by Lean Startup and other similar philosophies. The management will make decisions on resource allocation between the teams and setting the overall strategy, whereupon each squad will be responsible for a limited set of KPIs and one of the business areas. However, it is important to keep communication between these teams to avoid creating another kind of silo organization consisting of these cross-functional squads. Cross-functional teams themselves do not guarantee a lack of silos and free flow of information. Furthermore, having more independent teams with responsibility for a set of KPIs requires sufficient resources and freedom to decide within the squads so that they have what they need to work towards the agreed-upon targets. Also, connecting the targets and KPIs for the squads with the overall corporate strategy is an important task for the management team so that the squads are working in line with the overall strategy. This way, aligning all squads toward the overarching goals of the company is possible, which is arguably an important success factor of the Spotify squad model (Mankins & Garton, 2017).

In line with the proposals in Lean Analytics (Croll & Yoskovitz, 2013), the chosen OMTM for the platform squad is actionable for the team that can take both operational actions and change the product to improve the metric. That the metric is a ratio is also of benefit since it will help to track the quality of the service for new users regardless of the absolute number of new users (Croll & Yoskovitz, 2013). However, the team uses it together with several other metrics that are not all relevant and in full control of the specific squad. It is generally beneficial to concentrate the focus more diligently on fewer, actionable, metrics, to avoid information overload and including responsibilities that are not suitable for the specific team. The researchers have identified this as a challenge connected to the reorganization.

Preferably, more discussion should take place during meetings on a discussion around actions that can improve the metrics and analyzing what worked previously or not based on the data presented. Two other weekly meetings are opportunities to catch up and discuss freely. The team often brainstorms and discusses potential new ideas for the product. The team calls the meetings stand-ups, and they structure them inspired by concepts and ideas from Scrum (Schwaber, 1997) and Agile (Beck et al., 2001). Within Scrum, the daily scrums should take place every day. While teams are free to conduct them in any format, they should focus on problems and priorities that can help the team forward right away. The focus company could place more focus on such matters to avoid ending up in lengthy discussions about features that could be potentially implemented in the future. For many developers, this is a common practice while for others it may be a new way of working. Thus, it will probably take some time to adapt. The new organizational format takes the team toward the principle of agile development that is about connecting business and technical people daily (Beck et al., 2001). Preferably, the company should spend time in the meetings matching business needs with development possibilities, through presenting a list of needs or features and discuss the commercial potential and technical feasibility of those, facilitating prioritization within the squads.

5.3 Prioritization: determining what features to build

The company has not captured feature ideas and feedback in a structured and coherent way in a shared backlog between developers and other parts of the company. The new organizational format with squads has the potential to solve this issue by enabling shared backlogs within the squads. The team can use standups and other meetings within the squads to create a stronger understanding between the business and development functions as well as to make prioritization easier since both technical, business, and user perspectives are present simultaneously. However, it is quite different from the way the company works today and it is important that the squads get the authority and resources needed, and that the squads function well enough so that they can plan and execute without heavy dependence on the management team and other squads. This is especially important when scaling a company and passing the threshold where they cannot involve everyone in everything anymore (Kniberg & Ivarsson, 2012). Removing bottlenecks in decision-making is a key factor to keep up the development speed and shortening iteration cycles, one of the key ideas from Lean Startup and in general important in cases with a limited runway and where development and other resources are “fixed costs” in the form of employees which means that time is the biggest cost driver.

The company, and especially the platform squad, could benefit from a more experimentative approach to development inspired by Lean Startup (Ries, 2011). More specifically, the Build-Measure-Learn cycle is a useful workflow to make sure that the squads and the company evaluate and learn from what they build to make future prioritizations and decisions more accurate. Such an approach that is more test-driven, requires shorter development cycles in which the team builds a simpler version of a feature and tests it first before building a full-fledged and perfect solution. This is a way to both move quicker and reduce the risk of wasting development resources on unused features. This is especially important for startups with limited resources and can create more output in terms of learning for a given time/runway (Ries, 2011). It is important to include user feedback at all stages, including both idea generation and backlog prioritization in addition to the Build-Measure-Learn cycle (Bosch et al., 2013).

Looking specifically at the context of online communities, integrating user feedback in the prioritization becomes even more important due to the more complex incentive structures and value propositions of such services. Not only technological but also social and individual motivational factors determine the level of participation in a community (Antonacci et al., 2017). For professional communities in general, and within the medical domain specifically, it seems that perceived professional development is an important value to users (Hew, 2009). Even though this gives a hint

in which direction the company should start looking, it is still needed to understand what specific sort of perceived professional development that could be relevant in this case. Such information is rather qualitative and therefore most easily collected through communicating with users. In an online community, there are many types of users and user behaviors (Malinen, 2015). Hence, it will be important to talk not only to frequent users but also to more passive and non-frequent users that might derive value from the platform in other forms. Since many users have signed up for the platform and not been active, often even without testing it, it would also be beneficial to understand why those users would not use the platform.

The case company for this study aims to build a community for professionals that do not traditionally communicate openly with unknown colleagues. Since the platform also has characteristics of a two-sided marketplace with the supply and demand side, it is especially important to understand what motivates the supply side (aside from money) to improve the unit economics of the marketplace in the future. Even though "doing things that don't scale" may be a strategy to build critical mass, it is also important to have in mind that there needs to be a potential to eventually match supply and demand without needing to subsidize one of the sides too much and therefore slash profit potential.

As for any service relying on network effects to reach its full potential, it is hard to know what the actual value of the platform is until it has reached sufficient scale (Croll & Yoskovitz, 2013, p.218; Jorgenson, 2015). Partly since the complete value of the platform does not exist without a big enough network, but also because there is too little user data to properly analyze how the service is being used. Looking at the current platform, few users get activated and contribute substantially to the community. It is hard to beforehand predict whether a larger size of the network will make the product more valuable, and it is a risky strategy to try to scale the network without a deep understanding of the users and a strong and informed conviction that a larger scale will provide value. On the other hand, as described by literature and practitioners within network effect businesses, to "fake it til' you make it" is a common way to try out whether critical mass will create product-market-fit or not. This can include things like subsidizing parts of a network or manually doing things in an inefficient way to test the value proposition (Jorgenson, 2015). Another potential strategy would be to carve out a niche on the platform and try to build critical mass within this to test hypotheses on a smaller scale.

At the current stage, the case company has a limited understanding of incentives for different users. They have close contact with a few superusers and people within the industry, but they would need more user research to understand incentives for the broader mass of users. This includes both understanding how users perceive the platform to make design and communication more effective and developing the value proposition and the product in general. The team could bridge the gap between product functionality and the perception of it among users through simplifying it and its design or adding explanatory features such as a more instructional onboarding experience.

One key idea from Lean Analytics is to identify the current stage of a startup and use this to decide what metrics to focus on and consequently what actions to prioritize (Croll & Yoskovitz, 2013). For instance, the case company is in the Stickiness stage (Figure 1). More specifically, the data indicate that users do not get activated in the first place rather than churning after a period of usage. This insight was the background for deciding on an OMTM that focused on measuring the extent to which new users became active in the first week after signing up for the platform. Choosing a single metric makes it easier to prioritize features for the platform compared to if using multiple metrics (Croll & Yoskovitz, 2013). However, it is important to note that such a mindset is rather short-sighted and focused on exploiting current opportunities rather than building optionality for the long run. One can connect this to the experimentative vs transformative views on entrepreneurship as described in the

literature review (Berglund et al., 2020). Focusing too much on experiments to optimize the OMTM could clash with the long-term vision of a transformative entrepreneur (Thiel & Masters, 2014). On the other hand, trying to realize a vision with a long-time horizon without evaluation and adaptation during the journey is a risky and uncertain enterprise.

Being more aware of how both heavy and lost users perceive and use the current product is important regardless of what strategy for reaching product-market-fit the company chooses. By focusing too heavily only on those who already use the product, it is hard to learn about what is lacking and how the product and offering need improvement to also satisfy those users who have tried the platform and churned. While it is important to prioritize the needs of the core customers, the team must understand other users to understand what they need to reach a broader mass. Literature on product development shows that it is common among companies developing software products to have insufficient processes for tracking and evaluating features after implementation (Bosch et al., 2013). From the perspective of the Lean Startup methodology and Build-Measure-Learn cycle (Ries, 2011), the case company has insufficient processes and methods for capturing insights and feedback about already implemented features. Specifically, the feedback loop between developers and users is not very tight. The changed organization model has the potential to improve on that, but it will require a changed mindset about how to prioritize and update the roadmap and backlog. The main advantage of switching to cross-functional teams is that development and business get integrated into the same team. As prioritization includes weighing both commercial potential and technical complexity, it is advantageous to have these two perspectives interacting throughout the company. Regardless of whether the company uses a more experimentative or transformative approach, processes for product analytics are useful to create tighter feedback loops after implementation. It also enhances the ability to make future prioritizations and learn about the customers and value proposition. Lacking processes for evaluating implementations and understanding how users use the product and different features makes it harder to learn from experiences and previous implementations. Evaluation is a key part of Lean Startup and is one of the steps in the Build-Measure-Learn cycle (Ries, 2011). By evaluating, product developers and designers will also get information about what features are not used or valued by users and that they thus can remove. Without proper processes for evaluation, it is easy to keep adding features and therefore creating a complex and cluttered product or service.

Specifically, for the open platform, the case company would benefit from using a more experimentative approach to things like the user interface which is very hard to guess and have visions about. Continuously developing smaller versions of features and using techniques like A/B testing is a way to support the prioritization decisions and enable quicker decision making without getting stuck in internal discussions about prioritizations or over-relying on gut feeling (Kniberg & Ivarsson, 2012). Experiments are a practical way to infer things about user demands (Spiegelhalter, 2019) and to use as a basis for decisions about larger prioritizations. Essentially, A/B testing is an example of a method used to enable the last step in the Build-Measure-Learn cycle. One of the big benefits of digital products is that small and quick A/B testing of designs and prototyped solutions is relatively cheap and easy. The features developed for the experiments do not have to be scalable and optimized but should rather be as proxies for a more stable solution to develop later in case the experiment shows that users value the feature. In the presence of an OMTM, the main objective of all experiments should be to improve this metric. Therefore, having a single metric becomes a guide in the prioritization of which experiments to run. However, it is important not to get myopic about the OMTM or other metrics. Historical observations and data will not capture all relevant information and are always viewed through some kind of theoretical lens formed by experience and theory (Deutsch, 2011). Regarding the OMTM, it is important to make sure that the OMTM connects to the company's business model and current maturity stage (Croll & Yoskovitz, 2013). Combining quantitative data with qualitative data and theory is crucial in early-stage startups when the

environment is dynamic, and the future is unlikely to perfectly resemble history. The fact that the user activity of early-stage platforms is often low and thus, the existing user activity data is not enough to use as the only basis for decisions about future prioritization, strengthens this argument.

6 Conclusion

To answer the first research question, we have discussed the reasons why startups might pursue a multi-business strategy, and how a firm can do it. In presence of multiple business opportunities with different time-horizons until potentially becoming profitable, a startup can deem it necessary to establish several business areas in parallel. Technical synergies and a more complex business offering can arguably also make early-stage diversification beneficial. At the same time, this puts pressure on prioritization and resource allocation among the business areas. As shown in this case, business areas are not of equal priority, leading to stagnation of progress in business areas with long-term potential. One must design the organization to support the execution of the multi-business strategy, which is preferably done through intentional decentralization of as much decision-making and responsibility as possible. When the company is too centralized, the multi-business strategy risks getting too complex to manage. Also, it is important to make sure that teams within the decentralized organization have the resources and authority needed to execute and reach the KPIs assigned to them and that these KPIs connect to the company strategy.

Concerning the second research question, we have analyzed the case company's process of combining qualitative and quantitative data analysis with experience and domain expertise to help prioritization. It is advantageous, and arguably even more so in a decentralized organization, to focus the work of squads on a key metric or OMTM. However, one must combine such focus with an entrepreneurial mindset and behavior, driving the squads toward performing on the OMTM. An experimentative approach, involving consideration of customer feedback and testing at all stages of the product development cycle, should be a cornerstone in every part of the organization. Thus, even when organizing for pursuing multiple business areas, it is useful to employ the practices of a startup evaluating one idea at a time. In a multi-business startup, one must implement such practices and maintain them within each business area and squad.

6.1 Implications for practitioners

Startup managers pursuing a multi-business strategy should consider several issues and trade-offs. These include strategic, organizational, and prioritization aspects specific to multi-business startups, but also aspects related to balancing data with experience that might exist also in other organizations. We have compiled all considerations below, in a checklist based on the three overarching areas described in chapter 5. Some of these considerations are specific to companies following an organizational structure with squads (mostly those under Organization).

Table 5: Checklist for multi-business startups

Strategy	• **Focus vs Diversification:** By having multiple business areas at once, the firm gets a broader scope of opportunities while the focus on each of them is limited. • **Resource allocation:** Having multiple business areas as a startup makes resource limitations an even more pressing issue. • **Resource utilization vs flexibility:** By allocating all resources across business areas, there is no room for agility and adaptation based on changing circumstances or arising opportunities. Also, this limits the ability to explore new ideas. • **Synergies and complementary assets:** There can exist both cost economies of scope and competitive advantages from having multiple related customer offerings based on a shared technology platform.

	• **Time horizons and sequencing:** Developing one business area at a time increases iteration speed within that area; however, the learning speed for the company might still be higher with parallel businesses.
Organization	• **Decision-making speed:** When running multiple business areas as a startup, it is important to not let the decision-making speed slow down by creating bottlenecks such as too rigid hierarchies. • **Autonomy, efficacy, and accountability in squads:** To be successful, the squads must have the autonomy to make decisions on their own and have the resources and authority needed to reach the objectives set up for each one of them. They must also be accountable for working towards reaching the agreed-upon targets. • **Avoid a new form of silos:** It is common to shift from functional to cross-functional teams to remove functional silos; however, this must not come with new silos between the squads. • **Use good and actionable KPIs:** To help the squads focus, it is important to agree on KPIs for each squad connected to the company strategy and make sure that these are actionable and within reach for the squads.
Prioritization	• **Use KPIs to prioritize:** Prioritize the things with the highest expected effect on the KPIs. This requires having good KPIs covering the important objectives for the squad. • **Adopt an experimentative approach:** Treating feature ideas and requests as hypotheses to test instead of viewing decisions as definite and irreversible helps speeding up decision-making processes and development. This also includes working with small development packages and testing to minimize time spent building things customers do not value. • **Continuous evaluation:** Evaluate all implementations with quantitative and qualitative data from users. This includes having tight feedback loops between developers and users and capturing qualitative user feedback in a structured and unbiased way. • **Prioritize in the squads:** To maximize the development speed in the squads and utilize the different perspectives within them, as much of the prioritization as possible should take place in the squads, and preferably, prioritizing a common backlog should be the key issue during squad meetings. • **Use data wisely:** Combining qualitative and quantitative data with experience is important but should happen intentionally and transparently (not *"using statistics like a drunk man uses a lamppost; more for support than illumination"* (quote by Andrew Lang)). • **Understand user incentives:** For online communities, it is important to understand the incentives for different groups of users.

6.2 Implications for researchers

While this case explains the rationale behind a startup pursuing a multi-business strategy, it also uncovers several related problems and obstacles connected to it. Literature on entrepreneurship focuses on startups evaluating one idea at a time. More research could focus on studying companies that have diversified their business in their early stages. While the focus company in this study still has its faith determine, it could be interesting to look for examples of both success and failure among other ventures and to evaluate challenges and advantages of such a strategy along the whole company journey and across companies and industries.

7 References

Afuah, A. (2012). Are network effects really all about size? The role of structure and conduct. *Strategic Management Journal*, *34*(3), 257-273. https://doi.org/10.1002/smj.2013

Antonacci, G., Colladon, A. F., Stefanini, A., & Gloor, P. (2017). It is rotating leaders who build the swarm: Social network determinants of growth for healthcare virtual communities of practice. *Journal of Knowledge Management*.

Beck, K., Beedle, M., Van Bennekum, A., Cockburn, A., Cunningham, W., Fowler, M., Grenning, J., Highsmith, J., Hunt, A., Jeffries, R., & Kern, J. (2001). The agile manifesto.

Berglund, H., Bousfiha, M., & Mansoori, Y. (2020). Opportunities as artifacts and entrepreneurship as design. *Academy of Management Review*, *45*(4), 825-846. https://doi.org/10.5465/amr.2018.0285

Bosch, J., Holmström Olsson, H., Björk, J., & Ljungblad, J. (2013). The early stage software startup development model: a framework for operationalizing lean principles in software startups. *International Conference on Lean Enterprise Software and Systems*, 1-15.

Croll, A., & Yoskovitz, B. (2013). *Lean Analytics*. O'Reilly Media.
Deutsch, D. (2011). The Beginning of Infinity: Explanations that Transforms The World. Penguin Group.

Dul, J., & Hak, T. (2007). Case study methodology in business research. Routledge.
Ellis, S., & Brown, M. (2017). Hacking growth: how today's fastest-growing companies drive breakout success. Currency.

Fahey, R., Vasconcelos, A. C., & Ellis, D. (2007). The impact of rewards within communities of practice: a study of the SAP online global community. *Knowledge Management Research & Practice*, *5*(3), 186-198.

Faraj, S., & Johnson, S. L. (2011). Network exchange patterns in online communities. *Organization science*, *22*(6), 1464-1480.

Füller, J., Hutter, K., Hautz, J., & Matzler, K. (2014). User Roles and Contributions in Innovation-Contest Communities. *Journal of Management Information Systems*, *31*(1), 273-308. 10.2753/MIS0742-1222310111

Goldenberg, J., Libai, B., & Muller, E. (2010). The chilling effects of network externalities. *International Journal of Research in Marketing*, *27*(1), 4-15.

Gregory, R. W., Henfridsson, O., Kaganer, E., & Kyriakou, H. (2020). The Role of Artificial Intelligence and Data Network Effects for Creating User Value. *Academy of Management Review, In-Press*. https://doi.org/10.5465/amr.2019.0178

Hagiu, A., & Rothman, S. (2016). Network effects aren't enough. *Harvard business review*, *94*(4), 64-71.

Hew, K. F. (2009). Determinants of success for online communities: an analysis of three communities in terms of members' perceived professional development. *Behaviour & Information Technology*, *28*(5), 433-445. 10.1080/01449290802005995

Holmström Olsson, H., & Bosch, J. (2015). Towards Continuous Customer Validation: A Conceptual Model for Combining Qualitative Customer Feedback with Quantitative Customer Observation. *Lecture Notes in Business Information Processing*, *210*(1), 154-166. 10.1007/978-3-319-19593-3_13

Iacono, J., Brown, A., & Holtham, C. (2009). Research Methods - a Case Example of Participant Observation. *The Electronic Journal of Business Research Methods*, *7*.

Jorgenson, E. (2015). *The Power of Network Effects: Why they make such Valuable Companies, and how to Harness them*. https://medium.com/evergreen-business-weekly/the-power-of-network-effects-why-they-make-such-valuable-companies-and-how-to-harness-them-5d3fbc3659f8

Katona, Z., Zubcsek, P., & Sarvary, M. (2011). Network effects and personal influences: The diffusion of an online social network. *Journal of marketing research*, *48*(3), 425-443.

Katz, M. L., & Shapiro, C. (1985). Network Externalities, Competition, and Compatibility. *American Economic Review*, *75*(3), 424-440. https://www.jstor.org/stable/1814809

Kniberg, H., & Ivarsson, A. (2012). Scaling agile @ Spotify. *UCVOF*.

Lerner, J., & Tirole, J. (2002). Some simple economics of open source. *The journal of industrial economics*, *50*(2), 197-234.

Malinen, S. (2015). Understanding user participation in online communities: A systematic literature review of empirical studies. *Computers in Human Behavior*, *46*, 228-238. https://doi.org/10.1016/j.chb.2015.01.004

Mamykina, L., Manoim, B., Mittal, M., Hripcsak, G., & Hartmann, B. (2011). Design lessons from the fastest q&a site in the west. *Proceedings of the SIGCHI conference on Human factors in computing systems*, 2857-2866.

Mankins, M., & Garton, E. (2017). How Spotify balances employee autonomy and accountability. *Harvard Business Review*, *95*(1).

Nelson, S. (2020, March 18). *How DigitalMarketer Activated 44% of Previously Silent Community Members in 5 Days*. digitalmarketer.com. Retrieved January 2, 2020, from https://www.digitalmarketer.com/blog/activate-community-members/

Porter, C. E. (2004). A typology of virtual communities: A multidisciplinary foundation for future research. *Journal of computer-mediated communication*, *10*(1).

Ries, E. (2011). *The Lean Startup*. Crown Publishing Group.

Salameh, A., & Bass, J. M. (2019, May). Spotify tailoring for promoting effectiveness in cross-functional autonomous squads. *International Conference on Agile Software Development*.

Schwaber, K. (1997). Scrum development process. In *Business object design and implementation* (Vol. 2017, pp. 117-134). Springer, London.

Spiegelhalter, D. (2019). The Art of Statistics: Learning from Data. Penguin UK.
Thiel, P., & Masters, B. (2014). *Zero to One*. Crown Business.

Werder, K., Seidel, S., Recker, J., Berente, N., Gibbs, J., Abboud, N., & Benzeghadi, Y. (2020). Data-Driven, Data-Informed, Data-Augmented: How Ubisoft's Ghost Recon Wildlands Live Unit Uses Data for Continuous Product Innovation. *California Management Review*, *62*(3), 86-102. https://doi.org/10.1177/0008125620915290

Wiltbank, R., Dew, N., Read, S., & Sarasvathy, S. D. (2006). What to do next? The case for non-predictive strategy. *Strategic Management Journal*, *27*(10), p.981-998. https://doi.org/10.1002/smj.555

Yang, J., Tao, K., Bozzon, A., & Houben, G.-J. (2014). Sparrows and Owls: Characterisation of Expert Behaviour in StackOverflow. In *UMAP 2014: User Modeling, Adaptation, and Personalization* (Vol. 8538, pp. 266-277). Springer, Cham. https://doi.org/10.1007/978-3-319-08786-3_23

Yau, A., & Murphy, C. (2013). Is a rigorous agile methodology the best development strategy for small scale tech startups? *University of Pennsylvania Technical Reports*.

8 Appendix

Interview template A – PM

How are insights and ideas generated for new products or features?

How are these insights and ideas transferred to the developers' backlog?

How is the backlog prioritized today?

How do you estimate and weigh benefits and costs for development for specific feature or product ideas?

How do you later evaluate whether a product or feature was successful or not?

How are ideas and requests transferred from your list of ideas to the development team's roadmap and backlog?

How is the product roadmap updated?

Interview template B - CTO

How are insights and ideas generated for new products or features?

How are these insights and ideas transferred to the developers' backlog?

How is your product roadmap related to the development team's backlog?

How and when is the product roadmap updated?

How is the backlog prioritized today?

How do you estimate and weigh benefits and costs for development for specific feature or product ideas?

How do you practically implement the prioritized features?

How do you later evaluate whether a product or feature was successful or not?

What was the reason why you landed in this new organizational model?

How are developer resources prioritized between the different squads?

Interview template C - domain expert

How do you view the professional's incentive structure around participating on the platform?

What drives and prevents their activity?

What is your view on how products and product features are prioritized on the platform?

Interview template D - CEO

What is the rationale behind having several business areas?

How are you prioritizing between these business areas?

How are you prioritizing different products and product features?

How do you weigh the benefits and costs of development packages?

How is the product roadmap updated?

How is the developer's backlog prioritized today?

How are products and product features evaluated after implementation?

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