

A Work Project, presented as part of the requirements for the Award of a Master's degree
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Product development in tech-driven Startups: How do startups founded by non-technical
founders differ in market capitalization, capital efficiency, revenue, and time-to-market
based on their approaches to product development, whether through Co-founder
collaboration, No-code tools, or by outsourcing?
An analysis of the Consumer Tech Industry

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Abstract:

This paper aims at analysing how the different product development approaches followed by a non-tech founder impact success measure in a tech driven startup. For this, qualitative and quantitative research was conducted with the goal of establishing points of comparison and discrepancies between the development methods used. A deepen analysis was conducted in the Consumer Tech industry, in which a positive tendency towards having a Co- founder was verified. Additionally, No-code tools are expecting a rise in terms of usage, due to their further advancements and crucial contribution in bringing a quick proof of concept to the market.

Keywords: Product Development, Tech Startup, Co-founder, No-code, Outsourcing, ConsumerTech,

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Introduction

A startup is an early-stage company aiming at escalating fast, which on the paper translates to 50-100x growth in a year (*What Is a Startup? : YC Startup Job Guide | Y Combinator*, n.d.-b). This results in a hyper changing environment which is often referred to as a rollercoaster, with daily successes and failures (*The Startup Roller Coaster: How to Navigate Insecurities and Achieve Triumph*, n.d.). In fact, researchers wonder whether entrepreneurship and failure are natural siblings (Mantere et al., 2013). With more than 90% of the startups experiencing failure (Kalyanasundaram, 2020), it is crucial to grasp what is indeed on the base of the luckiest and most successful ones. Starting a new business is never easy, even when all the requisite stars align, meaning confidence is up, the business context is ideal, and incomes are growing (Global Entrepreneurship Monitor, 2023). This challenge becomes even greater if you dare to enter the world of tech ventures as a non-tech founder. That's why this paper aims to find ways for non-tech founders to assert themselves in shark tank of tech startups, with a clear focus on product development. This chapter introduces to this research, by providing a summary of the background and motivation of this paper, followed by an overview of the research questions analysed and concluding with limitations and a brief outline of the structure of this paper. In this paper a non-tech founder is a founder who has no educational background in tech subjects such as computer science, while tech start-ups are defined as companies whose core is a digital product. Adding on this, existing literature has identified 3 main product development approaches for non-tech founders in tech ventures (*Advice for Non-technical Founders Creating a Startup*, n.d.). However, there is still no specific research comparing these 3 factors, which is a clear research gap due to various business students being interested in founding a tech startup. Therefore, this study aims to achieve a comparison between the 3 main product development approaches. It

focuses specifically on the Consumer Tech industry in Europe. The aim is to create a quantitative comparison between the product development approaches and to work out the individual advantages and disadvantages of each approach. This results in the following research questions (RQ):

Research Questions:	
RQ1:	How do the product development approach Co-Founder, No-code and outsourcing impact market capitalisation, capital efficiency, revenue, and time-to-market?
RQ2:	What are challenges and benefits of the Co-Founder product development approach for non-tech founders in tech ventures?
RQ3:	What are challenges and benefits of the No-code product development approach for non-tech founders in tech ventures?
RQ4:	What are challenges and benefits of the outsourcing product development approach for non-tech founders in tech ventures?
RQ5:	What are expected future developments and trends in product development for non-tech founders in tech ventures?
RQ6:	How do the product development approaches Co-Founder, No-code and outsourcing for non-tech founders in tech ventures compare?

Figure 1: Research questions

This study will help non-tech founders entering the tech landscape by raising awareness of the 3 main product development approaches and providing potential non-tech founders with an information base for choosing their individual preferred approach. In addition, the followed frameworks offer the possibility to continue objectifying and expanding the comparison of the 3 different approaches through further quantitative data collection. For that, the limitations in this work can be used as a starting point. As this research focuses specifically on two industries, the results cannot be generalised to the tech ecosystem in Europe. In addition, the generalisability of this work is limited by small amounts of data due to time constraints and the choice of non-probability sampling. To achieve the research objectives, this paper will first analyse existing literature and present the thematic analysis and surveys as 2 main methodologies. Then the findings for the Consumer Tech industry are presented and discussed. Finally, this is then summarised, enhanced by expert opinions, and related to the research question.

Literature review

In the startup development the size of the market is also a critical factor. Even if the product is excellent, its impact may be limited if the market is too small (Vipond, 2023). For entrepreneurs,

then, the challenge is to find an opportunity in an attractive market. When they succeed in observing these opportunities and establish a strong alignment between the market and themselves, the founders are already on the right path to join the 10% of startup survivors (Go, 2014). With this in mind, it is essential to define as the first step, what portrays an attractive market. At the core of its definition, prevails a market which allows for high profitability (Wernerfelt & Montgomery, 1986) and is poised to grow in value and demand (Dawkins, 2023). When looking at the news, reading articles or just even by looking at the list of the wealthiest people in the world, a tendency always falls under the big technology box as the most promising one (World's Billionaires List the Richest in 2023, n.d.). As mentioned during a conference of Dealflow, by Yoram Wijngaarde, Europe's tech ecosystem in 2023 has a combined value of \$3.4 trillion, an increase of almost 1000% since 2013, precisely showing the capacity to still flourish and escalate tremendously in the following years. In the European Union in 2020, around ¼ of all graduates studied Business, administration, and Law (Statista, 2023). This might imply their automatic exclusion from creating a startup in the most attractive industry, technology, since no educational background on the field was previously obtained. However, when looking at real-life examples, we don't see this trend applying. George Kurtz, CEO and Co-founder of CrowdStrike, the most valuable tech company in EMEA, did his bachelor studies in accounting (CrowdStrike, 2023) and found his path into creating a firm worth \$42 billion. So, in the end, it is all about finding alternative ways to develop a tech product, even in the scenario of being a non-tech founder, with no technical roots. Nonetheless, before delving deeper into understanding the above stated topic, it is important to outline the concept of non-tech and tech. Starting with tech or more specifically having a technical background, two different concepts can be approached: education and professional experience (Hare, 2022). Regarding the first one, a technical educational background majorly comprises the areas of engineering, natural sciences,

information, and communication technology (Statista, 2023). On the other hand, a technical professional experience refers to jobs which fall under the spectrum of network engineer, web developer, cyber/information security engineer, computer systems specialist, data mining and systems analyst and software developer/engineer (Amandolare & Dvorkin, 2021). Taking this into account, a technical founder could be either categorized by their diploma or experience. In this paper, we will refer to a tech founder solely considering their educational background. This is explained by the fact that computer science graduates hold a substantial number of tech positions. However, it is essential to underline that performing in another area, due to for example a shrinking of opportunities on their tech field, does not translate their inability to build a tech product competently (Singer & Huang, 2022). All in all, and providing instances, a non-tech founder refers to someone who studied Business or Arts whereas a tech-founder has educational studies in computer science or software development (Statista, 2023). The following section aims to understand if, and in which way, is it possible for a non-tech founder to develop a tech product.

Product development approaches

“If you don’t have a dog, you hunt with a cat” (Batt, n.d.) is a Portuguese proverb that has been passed through generations and that aims at highlighting the importance of finding alternative ways if we lack initial resources. It is with this mindset that non-tech founders have innovatively navigated past their lack of technical expertise and found a creative way of entering one of the most attractive markets. As a non-tech founder, the 3 most common ways of developing a tech product in a startup, is through finding a Co-founder, using No-code tools or by Outsourcing, which will be further analysed (Advice for Non-technical Founders Creating a Startup, n.d.).

Creating a startup is a journey worth sharing and that is why many founders choose to go through

it with a **Co-founder**. One example of this approach is Brian Chesky, the Co-founder and CEO of Airbnb, an industrial designer with a degree in fine arts, who decided to join forces with Nathan Blecharczyk. With his Co-founder's technical background in computer science, they were able to build a \$100 billion-dollar company (Hare, 2022b). Several potential obtainable advantages are in the mind of those who decide to have a Co-founder. As stated in the example before, it is a way of complementing skills and knowledge as well as to create synergies. Additionally, it increases brainstorming since different perspectives are more often put on the table (Panel, 2023). Several industry experts argue that being a solo founder is building a formula for disaster and many venture capital firms and incubators even openly recommend against funding solo founders specially in pre-seed and seed stages (Howell, 2022). Furthermore, apart from decreasing financial risks, if both founders are committed, they can find on each other strength and motivation to go through the hard times (Panel, 2023b). On the other hand, being a solo founder can increase the speed in decision making, since the full control of the startup allows for a higher flexibility. Moreover, creating a company alone, equals holding the whole equity of the firm, being entitled to all the rewards (*Antler*, n.d.). Also, data from Crunchbase, indicates that single founder startups are the most common when it comes to raising greater than \$10 million, corresponding to more than 40% of all fundraises particularly regarding series-A and later (Kamps, 2016).

Another option is by using **No-code** platforms, a market which is expected to grow from \$6 billion in 2021 to \$12.3 billion in 2024 (Gartner Forecasts Worldwide Low-Code Development Technologies Market T, 2022). In addition, according to Gartner, by 2024, these tools will be responsible for more than 65% of application development (Kenneweg et al., 2021). To understand the role of this tool it is important to first define what it consists of. A No-code platform allows the

development of a product without needing to write any code. It often comes with pre-built templates and customizable options allowing any person to build a solution themselves. These platforms frequently are user-friendly, making them simple to use and expand upon. Moreover, these advancements enable a speedier and less costly development process since the use of visual modelling allows developers to skip the need for traditional code, leading to a faster time-to-market. Also, it is simpler to test the product and if needed fail sooner (Kenneweg et al., 2021). However, these tools offer limited customization since users are restricted to the features and functionalities given by the platform. In addition, they are not proper for complex and large-scale projects, presenting scalability constraints, since as the product and startup grows, a higher degree of tailor made solutions is needed. Another burden is if the users decide to migrate to another platform, they won't be able to maintain what they created, since the platform locks them in. Lastly, No-code tools may increase technical debt, as founders don't understand the code as well as its safety best practices, increasing security and compliance risks (OutSystems, n.d.).

As a non-tech founder, developing a tech product can also be obtained by **Outsourcing** it, recurring to software related agencies. Over the past few years, many firms have started to learn “not to make things” and distributing some tasks to others who can do it and in a more effective way (Zhao & Calantone, 2003). Outsourcing enables firms to access skilled and expert professionals who can drive a higher quality product delivery, without needing those abilities in-house. Moreover, it also allows the team to not become overloaded in task performance and to focus more on their core activities (Zhao & Calantone, 2003). In the startup ecosystem the timeframe of going to market is always short, and teams need to react fast and develop quickly. Outsourcing gives founders the freedom to not need to learn how to code, which is heavily time consuming, enabling the startup to keep ahead of their competitors (Kasyanau, 2022). Additionally, it allows for a lower cost spent,

permitting the founders not to give away equity, nor to hire someone new to the team (Patel, 2017). On the other hand, some disadvantages include the difficulty in finding the right agency and form reliable tech partnerships which satisfy the business requirements and deliver high-quality solutions. With this, comes along the challenge in maintaining and controlling the superiority of the outsourced product, since the person is not working in-house and doesn't have the same motivation of driving the startup forward as a potential Co-founder or employee. Another drawback relies on communication barriers, which is increased by having different time zones, languages, and discrepancies on the preferred methods of communication (Patel, 2017).

Success measures

When looking at the key performance indicators startups consider, many were identified, such as profitability ratios, working capital per share and operating income (Pavone, 2019). However, when analysing the purpose of each indicator, several converge to the same point of study, for example, when assessing metrics of growth, 5 were identified: revenue, net income, headcount, customers, and cash (Beverly, 2017). Taking this into account, 4 success categories of research were built, aiming at analysing different perspectives of success but without giving a too exhaustive number of group differentiators. However, if different metrics were chosen to examine, the following analysis throughout the paper could lead to different results and findings. Thus, the measures which arose the most were in relation to: market capitalisation, capital efficiency, revenue, and time-to-market. Beginning with market capitalization, it has a significant role in defining the size of the startup and giving insights about the quality of the potential investment. It is based on the total amount of shares outstanding and the current share price (Kumar & Kumara, 2021). Secondly, a startup is said to be capital efficient if it can generate a maximum number of profits while minimizing the number of resources needed, ensuring a

smooth running of the business and objectives accomplishment (Ghosh & Maji, 2004). Revenue ranks as one of the most important key metrics for firm insiders and outsiders. It describes the operating amount generated by the firm and its growth trajectory indicates if the business is thriving or not (Beverly, 2017). Lastly, time-to-market is an important metric to analyse the possibility of having a sustainable competitive advantage. A shorter time allows the firm to gain a higher market share, increase efficiency and create customer loyalty (Perols et al., 2012).

Research motivation

Building up on the literature review it arises the question if this implies a barrier for non-tech students entering the attractive tech ecosystem as an entrepreneur. For this it must be addressed if non-tech students are generally interested in creating a startup, and if so if this interest can also be seen in the tech ecosystem. Additionally, it will be analysed if potential non-tech founders expect to require technical knowledge to create a startup as well as the question to which extent they consider themselves to already have that. To tackle this question data was collected through a self-administrated online questionnaire (Ponto, 2015). As this study aims to analyse the European tech startup ecosystem, the target population were all students in the field of business, administration, and law in the European Union. Assuming the share of graduates per field of study to equal the share of students the overall population can be estimated to be 4,070,000 (Eurostat, 2023). To achieve a statistically significant sample size, considering a 90% confidence level and an 8% margin of error a minimum sample size of 107 was required. As this survey reached 159 people, of which 133 are relevant for the target population, the minimum sample size to be statistical representative of the population has been reached. However, the non-probability sampling method through cold outreach and with the use of online student groups limits the statistical significance for the population (Stratton, 2023). For this reason, the

following section attempts to validate the statistical significance of the survey more precisely with the help of statistical tests. When analysing the demographics of the sample, 156 participants were students. Furthermore, answers from 21 nationalities were registered, with Portuguese, German and Italian taking 83% of all respondents. Looking at the educational background, Bachelor (62 answers) and Master (93 answers) degrees were the most common. Additionally, 142 participants studied in the field of Business, Administration, or law, including economics, with 93% of all students studying in Portugal. In the next step the demographics of this sample will be compared to the target population, with the variable nationality being an example. Assuming the share of students per nationality to correspond with the inhabitants of that country, the Portuguese, German and Italian nationality take 34% of the population (Countries in the EU by Population (2023) - Worldometer, n.d. & Population of Europe by Country 2023 | Statista, 2023). This shows clear deviations from the 83% of the sample size and thus represents a limitation of the generalization of the results for the total population. To evaluate the influence on the statistical significance of this deviation of the sample on the population, a chi square test of independence is carried out under H_0 that there is no significant correlation between nationality and the consideration to create a Startup with the aim of finding out whether there is a statistically relevant correlation between the nationality and the interest in creating a startup. Due to the p-value of the chi square test of 0.001625876 there is strong evidence to reject H_0 . This allows the conclusion that in the given sample there is a correlation between nationality and the consideration to create a startup. This indicates a limitation of the statistical generalisability of the sample, as a different demographic distribution of nationalities could have a direct influence on the results of this survey (McHugh, 2013). Next, the survey answers will be analysed. From all 133 relevant participants 63.9% were interested in creating a startup in the future. From these

respondents 83.5% expected to require technology knowledge to create their startup, with 40.0% considering an App and 21.2% considering a software as one of the options to be the core product of their startup. This implies a high interest of non-tech students in creating a startup, especially in the tech ecosystem, equalling an estimated number of 2,170,00 students in the European Union. Of these students 91.5% answered to not have the required tech knowledge themselves. While these respondents ranked their confidence in knowing alternative product development approaches in the top 29.1% of the given scale percentile, only 8.5% considered all 3, in this paper compared, approaches, while 57.7% considered only maximum 1 approach, equalling an estimated number of 1,250,000 students across EU. This suggests that despite high interest from non-tech students to create a tech startup, lack of knowledge regarding different product development approaches regarding tech products can be identified as a potential barrier underlining the relevance of this paper.

Methodology

Following the literature review and research motivation this chapter aims to present the materials and methods used to compare product development approaches by non-tech founders in tech ventures and its impact on market capitalisation, capital efficiency, revenue, and time-to-market. For that, the further research design of the study follows the steps presented by Saunders et al. in the research onion. Firstly, the research philosophy, approach, design, and sampling strategy are presented. Then the used data collection & analysis techniques, including ethical consideration, are shown for both used research methods (Saunders et al., 2019).

Research philosophy

Although quantitative data was collected, categorised and conclusions drawn for the study, it is important to note that this analysis does not aim to identify causal relationships. Generalisable

conclusions of this type are not within the scope of this work and therefore the positive research philosophy is not applied (Park et al., 2020). On the other hand, a pure interpretivism approach was rejected due to the risk of participants having a euphemistic view of their decisions due to the purely subjective consideration (Alharahsheh & Pius, 2020). Instead, the incompatibility of subjective and objective research was rejected following a pragmatism research philosophy. This approach allowed the consideration of quantitative success metrics (McCarthy et al., 2023), while the subjective opinions of the study group were also used to emphasise the practical relevance of the study. This made it possible to support the results of the qualitative analyses with objective datapoints, while not allowing the generalisability of the results (Tashakkori & Teddlie, 1999).

Research approach

When choosing the right research approach, a distinction can be made between the 3 main variants of qualitative research, quantitative research, and the mixed method approach. The decision towards one of these approaches should be, among other factors, based on the research objective as well as the desired and available information (Taherdoost, 2022). Keeping this in mind a pure quantitative approach was not considered for this paper as a quantitative approach would have allowed the capturing of emotions and behaviours only to a limited extent (Queirós et al., 2017). Additionally, due to the confidentiality of requested data a low response rate was expected. Consequently, while this method could have been used to describe quantitative differences between the 3 analysed product development approaches, it was expected that the significance of the experiences and learnings of this method from a founder's perspective could not have been adequately presented. On the other hand, pure qualitative research was not considered due to expected biases. Due to high required involvement from interview participants,

it was assumed that selection bias could be encountered (Florczak, 2021). Additionally, the risk of the Ikea effect, namely Interviewees overvaluing the quality of their own product development approach was considered (Norton et al., 2011). To give the reader their own evaluation options in this regard, the results of each interview participant are, while anonymized, always linked to their mainly used product development approach. For these reasons a mixed method approach was chosen. The drivers for this decision were not only the potential to overcome deficits of pure qualitative or pure quantitative approach (O’Cathain et al., 2007), but also the potential to gain a better understanding of the research problem by facilitating different viewpoints (Bracio & Szarucki, 2020). In particular, a convergent parallel mixed-methods design was selected. This means that qualitative and quantitative data were collected simultaneously and analysed independently of each other. Only while interpreting the results of both data sets were merged to identify similarities and differences (Dawadi et al., 2021). However, this approach limits the possibilities of validation of this study, as factors like the integration of qualitative and quantitative data at the time of data collection or the sequence in which quantitative and qualitative data was collected are dependent on external factors and therefore difficult to replicate (Adu et al., 2022, pp. 324-326).

Research design

Looking at the research design, this study can be divided into a qualitative and a quantitative part. Starting with the qualitative part, a thematic analysis research design was chosen. This decision was motivated by the strength of this design to identify similarities and differences throughout large data sets, allowing the researchers to identify patterns over different interviews. While this research strategy comes with restricted interpretability, this study aims to mitigate this limitation through the integration of a quantitative analysis (Braun & Clarke, 2006). Specifically,

an inductive thematic analysis was chosen. This means, that the used codes emerged from collected data, not from pre-existing theories (Boyatzis, 1998). A detailed overview of the process for the thematic analysis as well as the individual codes and resulting themes is provided in the qualitative data analysis framework chapter. Secondly, for the quantitative part of this paper originally a survey-based research approach was planned, as with all European non-tech founders of tech ventures a large population was analysed. For that, an electronic survey was used as the main goal was to collect a big enough sample size to draw statistically significant conclusions for the population. For that the potential advantages of reaching a larger target audience and being able to analyse large data sets quickly outweighed the risk of non-responses (Jones et al., 2013). However, during the pilot phase of this survey, unexpectedly low response rates were registered (Shiyab et al., 2023). Limited by the time horizon of this work, it was not an option to improve the response rate of the survey over different piloting phases (Harrison et al., 2019). Instead, it was decided to include a secondary data analysis in the research design of this study. This decision was primarily due to the time saved in collecting secondary data compared to collecting primary data. However, the main limitation identified with this approach was the lack of important demographic data which is essential for the analyses underlying this thesis (Wickham, 2019). In particular, the possible lack of the chosen product development approach was identified as a challenge for each startup.

Sampling and sampling techniques

For the purpose of this study non-tech founders of tech ventures in Europe were defined as the to be analysed population. For that, non-tech founders are categorized as defined in the literature review. At a more advanced stage of this work, the population was then additionally reduced to the Consumer Tech industry. The reason for this was the selected sampling strategy of

convenience sampling. This selection was motivated by the aim of this work to answer the underlying research questions for different industries individually to be able to compare this research between the industries in the discussion in addition to the comparison with existing literature. To gather the largest possible sample size and different perspectives for both the qualitative and quantitative analysis, the convenience sampling was identified as most efficient. For that, founders from different industries were contacted first. In a second step, based on an analysis of the different response rates, the focus was then placed on the Consumer Tech industry (Jager et al., 2017). This led to an estimated population of 6,600 Consumer Tech startups. This estimate comes from secondary calculations estimating the number of startups in Europe at 123,000 based on data from German public company-registrar and Crunchbase (Hoekman, 2021b). In a next step, it was then estimated that 19.2% of these startups fall into the Consumer Tech industry (e-commerce & retail social and leisure sectors, both of which cover the Consumer Tech sector, although this industry was broader defined in this paper.). Lastly, assuming no significant differences between the educational background of founders of tech ventures between Canada and Europe the above-mentioned population can be defined if only the 28.3% of founders with a non-tech background are considered (Impact Centre Science to Society, 2019). To achieve a statistically significant sample size, considering a 90% confidence level and an 8% margin of error a minimum sample size of 105 for Consumer Tech was required. While this sampling strategy comes with the limitation of lower statistical generalisability in comparison to probability sampling, the decision towards this approach was driven by missing data to identify all non-tech founders of tech ventures in Europe, making a random selection of study participants not feasible (Stratton, 2021).

Results & discussion

Qualitative data analysis framework

The purpose of the qualitative analysis was to respond to the research question of how the 3 different approaches impacted market capitalization, capital efficiency, revenue, and time-to-market. Additionally, a comparison of the findings with the literature review aimed at being done. Following up on the qualitative research design illustrated previously, interviews were conducted to gather insights. For that, structured questions were built, in which all the inquiries were the same, standardized, and predetermined, to ensure the possibility of comparing the data (Nor Rashidi et al., 2014). The 7 questions were breakdown into 6 blocks. The first 3 parts consisted of Administrative, overview of Startup, product development approach chosen and respective reasons, and aimed at getting insights of the thoughts considered in the ideation phase. Secondly, a brief presentation of the other possible approaches was shared by the interviewees, to position the interviewee in the same level of knowledge. After, questions regarding challenges and benefits of the approach followed were asked, to get insights about the status of the startup. To end with, it was asked whether the founders would have preferred to follow another approach and to share their learnings, followed by mapping questions. The Interview guide can be found in Appendix 1. The interview participants were reached within a 1-month period, until November 2023. During this phase, 11 interviews were conducted, from which only 9 were considered, bearing the relevance of this study. 7 founders were contacted through cold messaging, using LinkedIn, or email and 4 were outreach during the participation of entrepreneurial related events. The interviews were done via Microsoft Teams, recorded using the same platform and transcribed with Aiko (Sorhus, n.d.). Additionally, each transcript was individually reviewed and anonymized and can be found in appendix 2-10. Subsequent to what was described in the methodology, a thematic analysis was chosen to analyse the interview data, in which no themes

were predefined. Considering this matter, the interview data was grouped according to the codes that emerged and a framework was constructed. Taking the beforehand stated, the 28 codes that emerged were then regrouped into 8 categories, that were subsequently represented into 6 themes, in accordance with the information they covered. The below graph shows the data grouping process, converging to the final 6 themes: Looking at the table, 6 themes can be highlighted. For this, in the individual qualitative chapters, they will be briefly described, while a more exhaustive overview of the components of each theme can be found in appendix 11.

Codes	- Trust - Transparency - Communication - Personal Fit - Knowledge transfer - Risk	- Motivation - Commitment - Equity - Vision	- Speed in developing - Time-to-market	- Cost - Opportunity cost - Monetary cost	- Skills complexity - Product complexity - Scalability - Interfaces quantity	- Product quality - Product depth - Quality control	- Fundraising - Speed of fundraising - Demand of fundraising - Easiness of fundraising	- Learnings - Future trends
Categories	Trust	Motivation	Speed	Cost	Product Complexity	Product quality	Fundraising	Future Outlook
Themes	1. Personal		2. Speed	3. Cost	4. Product		5. Fundraising	6. Outlook

Figure 2: Themes

These themes were subsequently divided into the 3 approaches: Co-founder, Outsourcing and No-code tools, to at a later stage recognize their impact in the aspects referred in research question.

Quantitative data analysis framework

In the following the applied data collection and analysis methods will be described. As the quantitative analysis of this thesis is two staged, first the framework for the primary data collection and analysis will be defined, followed by the framework for the secondary data analysis. Starting with the primary data, a survey was chosen for data collection. For that an online questionnaire was used, as a low response rate from the target population was expected due to the confidentiality of required data as well as the needed time invest for the survey. Here, the opportunity of online questionnaires to distribute them fast to a large audience was rated

beneficial. Additionally, the risk of a biased sample due to an exclusion of potential participants without access to electronic devices or internet was expected to be very low for European founders of tech startups (Regmi et al., 2017). This questionnaire had the goal to collect data about revenue, capital efficiency, market capitalisation and time to market of startups, as well as further information regarding the founder and the startup. For that the following question categories were used which can be found in appendix 12. This online survey was sent from calendar week 45/2023 to calendar week 50/2023 over various channels. The channels included internal channels in the founder community of the Haddad entrepreneurship institute (Nova SBE Haddad Entrepreneurship Institute, n.d.), the in-person approach of founders at startup events, distribution via WhatsApp groups of Nova SBE students and, as the main distribution channel, cold outreach via LinkedIn. The founders for LinkedIn Outreach were primarily identified through investors and accelerator programs such as Antler (Meet Our Portfolio | Antler, n.d.) or TechStars (Portfolio: Startup Companies We've Grown | TechStars, n.d.). After the data collection phase, the data set was split into one individual data set for each analysed industry. Then, all non-qualified entries were removed. Afterwards, data cleaning methods were applied on the dataset. For that, mainly incomplete data entries were deleted, and where possible incorrect datasets corrected. One example operation for this is to change the entry *Lisbon* to *Portugal* for the question about the country the startup is based (Van Den Broeck et al., 2005). After the data cleaning process first the demographics of the sample were analysed, followed by descriptive statistical analysis, focusing on summary statistics (Kaliyadan & Kulkarni, 2019). Lastly, all data sets were individually compared for each success measurement. For that a min-max-normalization was applied distributing all entries based on their relative value to each other on a scale from 1 to 10 to make the different success measurement comparable (Asesh, 2022). The from the normalization resulting result was then multiplied by the through the survey estimated

weighting of each success measurement for the industry. The mean result of all data entries per industry equals then the final score per industry. For the secondary data collection first the portfolios of major investors and accelerators were analysed for further information regarding the used product development approach and the applied success measures. After no additional data was found, startup databases were also analysed in the next step. Then, as the last step of the secondary data analysis, the number of potential startups was mapped for future analyses.

Discussion framework

After the presentation of the findings, the goal is to be able to draw conclusions regarding the comparison of product development approaches by non-tech founders in tech ventures and its impact on the 4 success measurements. For that, in the original research design of this thesis, the key results of the qualitative and quantitative analyses should have been first evaluated individually and linked to the research question. In a second step, the results should have been validated by identifying differences and similarities between the qualitative and quantitative analyses to compare these results with the existing studies analysed in the literature review. Due to the lack of data in the quantitative analysis, which not only did not provide statistically relevant results for the overall population, but also provided so few data points that the authors decided that this amount of data was not sufficient to be able to derive even a trend with sufficient certainty, the discussion is mainly based on the qualitative results. For this, first the key findings of the qualitative analysis are summarised to be able to draw conclusions for the research question. In a second step, these results are then compared with the findings from the literature to identify similarities and differences. Finally, the key findings of the quantitative results are summarised. However, this does not have the main objective of directly answering the research question. Instead, this should serve to recognise trends which allow conclusions to be drawn about

the reasons for the small amount of data to be able to make recommendations for further research on this basis.

[An analysis of the Consumer Tech industry](#)

Next, a comparison of the product development approaches Co-founder, No-code, and Outsourcing for non-tech founders in tech ventures in the Consumer Tech Industry will be done. For that, first the industry will be introduced. Then, qualitative, and quantitative findings will be presented. Lastly, these results will be analysed in the discussion chapter.

When looking at the Consumer Tech industry various definitions can be identified. McKinsey describes this industry under the pillar Consumer Technology & Media, uniting the areas of video, audio and publishing, E-commerce and marketplaces, gaming, and professional sports (Consumer Technology & Media, 2021). Accenture additionally focuses on hardware, like smart devices (Consumer Technology Industry Solutions, n.d.). Another perspective comes from Forbes putting the contact of consumers with AI into the focus of their Consumer Tech predictions for 2024 (Goswami, 2023). This clearly shows the different angles and perspectives that can be applied to that industry. For the purposes of this paper, Consumer Tech refers to business-to-consumer (B2C) tech ventures. In other words, startups that business directly on the consumer (Heaslip, 2022). To specify this further only digital products are considered as Consumer Tech in this paper. This mainly includes but is not limited to online marketplaces like Amazon or Airbnb (Chauhan et al., 2018) and mobile applications. As many companies nowadays rely on a multi-channel approach, also companies, like Starbucks, with their B2C mobile application, could fall into the Consumer Tech category by this definition (Boyd et al., 2019). For this reason, only startups that consider the online marketplace or mobile application as their core product are considered as Consumer Tech ventures. To ensure this, all founders were

selected accordingly for the qualitative analysis. For the quantitative part, only founders defining themselves as Consumer Tech were considered.

Qualitative results

First, the qualitative findings will be presented. For that, 4 founders were interviewed which will be presented in the following. A brief overview of all interviewed people can be seen in table 4:

ID	Gender	Industry	Product Type	Initial PD approach	Short description
1	male	Consumer Tech	App	No-Code	Social membership recommending restaurants / bars to bring people together
2	male	Consumer Tech	App	No-Code & outsourcing	Incentivizing users to do one environmentally friendly action every day
3	male	Consumer Tech	App	Co-Founder	Social network serving as a tool to create combinations from all fashion times owned
4	male	Consumer Tech	App	Outsourcing	App for vehicle owner to share them drivers to reduce ownership cost

Figure 3: Consumer Tech Interviewee overview

The first identified theme was **Personal**, which includes personal aspects like trust or motivation.

Starting with factors relating to the product development approach Co-founder, one aspect was trust. This was stated for the selection process of a technical Co-founder, due to challenges for a non-technical founder to evaluate them. A factor which was categorized mainly relevant for inexperienced founders: *“If you don't understand technology and you are an inexperienced founder, how can you even guess that this specific person is a good technical Co-founder” (IP4)*. Additionally, trust also was stated to play a major role when dealing with external stakeholders. Here, the lack of a technical Co-founder was categorised as a potential risk: *“They can tell you everything, if you're not an expert [...], at the end of the day, you have to trust them” (IP3)*. Moreover, integrity was named as an important criterion: *“[...] also very important integrity.*

[...] I would rather do it alone than start a company with somebody who is not at this extreme high level that somebody needs to be” (IP3). Furthermore, aspects around wellbeing were mentioned in combination with the product development approach Co-founder. Statements here described the effects of having someone with the same commitment on board: *“I think I'd prefer to have at least one person to do this with me because it's also it's tough, can be lonely at times” (IP3).*

Looking at factors relating to No-code tools, a recurring mention of independence as a relevant factor can be recognised. For example, it was stated that there is no dependency on external stakeholders. *“I don't have to rely on anyone else to use their time” (IP1).* Also, it was said that internal decisions can be made independently. *“You can take all the decisions alone. And therefore, you have maybe potentially less arguments” (IP3).* In this context, it was also said that this independence can come with the risk of incorrect decisions. *“Could also be that you then take wrong decisions just because you never have any arguments with somebody” (IP3).*

Lastly, looking at Outsourcing 3 aspects identified for this theme were iterative collaboration, conflicts of interest and transparency. First, a frequent communication and close collaboration between the founder and agencies was mentioned: *“[...] work really closely together with an agency [...] which was kind of iterative because we had contact with them every day” (IP2).* Moreover, another stated aspect was a conflict of interest between founders and Outsourcing partners, namely that founders have high quality expectations of the service, while the Outsourcing partners are only interested in fulfilling the agreed minimum quality requirements as quickly as possible: *The contractor wants to, do the minimum they can for the money you pay [...] While of course you want to spend your money in a way that you will have the maximum quality and output you can achieve” (IP4).* Connected to this, another common mentioning was

transparency. Here, one common aspect was the unclarity about the motivation of decisions from Outsourcing partners: *“It's not 100% clear if they can't actually perform the task because it's technically not possible or if they actually don't want to because it's too expensive or they don't have the skills” (IP2).*

Next, the theme **Speed** is presented, focusing on the pace of developing and launching a product.

One aspect stated in connection with a Co-founder was the challenge and time invest to find the right person, delaying the start of product development. *“We were definitely looking for somebody who has technical skills right now [...] but there we actually failed to find the right person” (IP2).* Also, it was stated that the experience of the Co-founder can influence the speed of development: *“If my Co-founder would have been even more experienced or if I would have been even more experienced [...], I think we would have been much faster with the time to market” (ID3).*

Next, looking into No-code as a product development approach, 2 common perspectives were identified for **Speed**. Firstly, No-code tools were seen as a fast approach: *“This was the fastest, quickest, easiest way for me to get to an MVP” (IP1),* as well as a high speed in decision making, due to less internal discussions, as already touched in the **Personal** theme. However, it was also stated that if there is not enough prior knowledge to build the desired product with No-code tools, this approach can be tedious, as learning these tools can be time consuming: *“As soon as you pay somebody, they do it as fast as possible but learning on your own takes longer” (IP2).*

Lastly, for Outsourcing as a product development approach mixed opinions were recognized. While one founder categorized Outsourcing as a very fast option: *“They try to maximize the speed” (IP4),* others mentioned the time invests for finding the right agency and to agree on satisfactory contracts: *“I would probably not waste a few years of my life and money because of*

wrong contract management” (IP4), and challenges regarding agility: “The major challenge with our product development was definitely to be as agile as if we would do it on our own” (IP2)”.

Following, the **Cost** for developing a product will be considered as the next theme.

Starting with the product development approach Co-founder it was mentioned that this can go hand in hand with a loss of equity: “I didn't want to give away a lot of equity to find a Co-founder that can develop the app” (IP1). Further a high capital efficiency and the possibility of longer periods without required external investments were described: “The first 12 months of this time, we were kind of bootstrapping [...] it's something that we couldn't have done if we would have needed to pay somebody, right?” (IP3).

Next, No-code tools were described as cost effective, both looking at direct cost, as well as opportunity cost thanks to the possibility of rapid market entry: “Therefore I've spent less money because essentially every month you are not launching, you're wasting a lot of cash” (IP1). Additionally, as mentioned in the Co-founder chapter, it was also said that No-code tools usually not come with a loss of equity. However, it must be noted that all these statements regarding the **Cost** of No-code tools come from IP1, which itself used No-code as its main approach.

Lastly, the product development approach Outsourcing was described as expensive, especially in the early stages of the venture: “The second one [Outsourcing] I didn't want to do because it's very expensive to do at the start” (IP1). Another stated aspect was the risk of unplanned cost increases due to longer development times. This can come from unplanned delays or necessary iterations to adapt the product to customer feedback even after finishing the development: “It would also be much too expensive, probably to do this with an agency because you would have to run tons of iterations” (IP3). Besides that, it was mentioned that Outsourcing can be a more

cost-effective option when only used for selected parts of the development process:” *I got an agency to help with the back-end development of the app, but it was far cheaper because they only had to just do a very small amount instead of having to do everything” (IP1).*

The next presented theme is **Product**, which covers product quality, complexity and the expertise required for product development. Starting with patterns related to Co-founder, the potential to specialize deeper on every aspect of the product development was mentioned, allowing founders to get more into research:” *We split ourselves up. So, I was kind of getting into this product knowledge [...] tons of user research, talking to users, all kinds of things. And my technical Co-founder did the development part, the implementation part” (IP3).* An additional aspect was the consideration that a released product rarely fits customer needs. Here, it was mentioned that the Co-founder will continue working on the product even after the initial release to achieve product market fit: *“The essential goal for us initially was to of course to bring a product out, but then to get this product to product market fit” (IP3).* Moreover, it was stated that expertise in different fields was required to build a product. This was often described as not feasible for a single technical Co-founder. A pattern frequently seen for app products with examples like different needs for an Android and an IOS application: *“So you need more than one person, expert in technology to develop an app” (IP4).*

For No-code tools one mentioning was the use case to create prototypes and proofs of concept: *“We used this prototype to just test the whole concept” (IP2).* Adding up on this, also the limitations this product development approach can bring in terms of available features or technical capacities from the founder: *“I hit a certain level of expertise that I could do myself with the app” (IP1).*

Adding up on this, Outsourcing as a product development approach was frequently described as

an option to use when reaching internal technical limits. Examples for this were, to use Outsourcing to add more complex features, to improve the product quality or to work together to implement features which required expertise knowledge in selected areas: *“I got an agency to help with the back-end development of the app” (IP1)*. Additionally, comments about lack of quality were identified: *“They try to maximize the speed and to give you the minimum” (IP4)*.

Next, the theme **Fundraising** presents the founders statements regarding access to investment.

Looking at Co-founder as a product development approach, 2 aspects were named for this theme.

Firstly, expertise in the founding team was stated as important to position itself stronger for fundraising: *“In terms of the market capitalization that we as a founding team are also perceived stronger and more independent” (IP2)*. Also, as already shown for **Cost** another mentioning was that the product development approach Co-founder can enable the startup to bootstrap for longer.

Following, for No-code it was mentioned that the speed of building a first product can enable a fastproof of concept as well as fast profitability. These factors were considered as beneficial for fundraising: *“Launch quicker so I could generate more revenue which then led to me being able to raise more money more quickly” (IP1)*

For Outsourcing, the lack of internal expertise was categorised as a potential risk for fundraising:

“It would definitely be more beneficial to have the skills on our own” (IP2).

Lastly, the theme **Outlook** presents the founders perspective on trends.

Looking at Co-founder, a frequently mentioned aspect was an expected decrease in demand for technical Co-founder. This came from the forecast, that in the future many products could be developed without technical knowledge: *“The technical Co-founder is less valuable than they were five years ago or even a couple of years ago because AI, because No-code is getting way more*

useful and way more easy for me as a non-technical person to use” (IP1).

Similar patterns were identified for No-code. Here an often-stated point was the expectation of an increased speed and capacity for more complex solutions when using No-code tools: *“People like myself who aren't technical can build things far quicker and actually go without a technical Co-founder for a lot longer” (IP1).* An additional prediction was the expected increase in No-code tools as a support mechanism for other product development approaches. This was mentioned to occur together with Outsourcing to build cheaper mock ups: *“I could also consider, you know, maybe to invest a few hundreds of euros with someone that will use these low-code, No-code tools and at least to come up with a very simple mock-up” (IP4)* as well as a supportive tool for technical Co-founder: *“The technical founder, who seems to be good, is just developing everything himself with the help of chat GPT and other tools online. So once was employing maybe three or four different people, now can be done with just one skilled person” (IP4).*

Lastly, looking at Outsourcing one aspect was the already in the No-code paragraph mentioned, potential to build cheaper mock-ups once Outsourcing partners will start using No-code tools. Another point was the expectation that AI will simplify the process of finding a good Outsourcing partner: *“It will probably be much easier to find the right agency because it's easier to match different interests with like advanced technologies like AI” (IP2).*

Quantitative results

After the presentation of the qualitative results, the collected quantitative data is presented following the above-described framework.

From the collected 31 data sets, 9 can be allocated to the Consumer Tech industry, on which this analysis will focus. During the data cleaning process 2 more datasets were discarded as they

could not exclusively be allocated to the Consumer Tech industry, as the survey respondents additionally selected the B2B Software industry. Additionally, 2 data set were removed as the survey participants were not relevant for the population analysed in this study, leaving the to be analysed data set with 5 entries. Next, all input fields were reviewed and updated. To convert monetary values to euros the Forbes currency converter was used applying the exchange rate from 18.12.2023(Guagenti, 2023). After the data cleaning process, the demographics of the data set were analysed. From the 5 respondents, 4 studied management and 1 psychology with 4 holding a master’s degree, and one of the management graduates holding a bachelor’s degree. Additionally, 2 of the respondents are first time founders and 2 of them serial entrepreneurs. Next, a descriptive statistical analysis was conducted. For that, a cumulated analysis of the complete relevant sample was made. This analysis can be found in table 5:

Sample						
	Time to market (months)	Market capitalization (€)	Revenue Y1 (€)	Revenue Y2 (€)	Cash burn Y1 (€)	Cash burn Y2 (€)
AVERAGE	8.0	2600000	10000	15000	16667	70000
MEDIAN	3.5	1200000	10000	15000	10000	70000
STANDARD DEVIATION	10.7	2600000	n.a	n.a	16073	n.a
FREQUENCY	4.0	3	1	1	3	1

Figure 4: Descriptive statistical analysis – Consumer Tech

Then the sample was broken down into subcategories based on the parameter *product development approach*. As the survey design defined the 3 approaches Co-founder, No-code, and Outsourcing and none of the respondents added additional approaches, 3 approaches were considered. As each approach can be followed individual or in any combination with the other approaches in theory 9 subcategories should have been defined. However, data was only available for 2 subcategories in the present data set. A descriptive analysis for each category can be found in appendix 13-14.

The next step was to analyse the for the Consumer Tech industry relative importance of the success measurements used for the quantitative comparison in this paper:

Market capitalisation	Revenue	Capital efficiency	Time-to-market
24%	28%	22%	26%

Figure 5: Weightings: Success measurements - Consumer Tech

Following on this, the data was compared between the individual subcategories. For this purpose, all data entries were compared for each success measurement by determining the two extreme values and for all other entries the relative position between the extreme values as described in the quantitative framework. The results of this analysis can be seen in the following scatter chart:

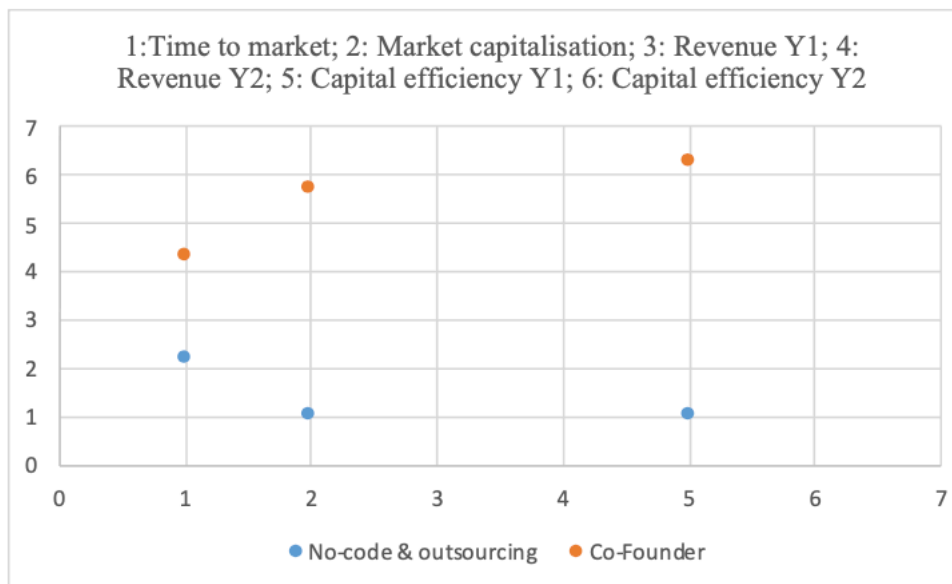


Figure 6: Comparison product development approaches – Consumer Tech

However, it must be noted that there was only 1 relevant data entry for the category No-code & Outsourcing. After summing the individual success measurements and weighting them based on the determined importance the overall result for the product development approach Co-founder was 3.16 points while the product development approach No-code & Outsourcing reached 0.92.

As this was only considered as a pilot study due to the above-mentioned challenges in data collection, next the results of the secondary data analysis are presented. As in the first step 55 startups in the Antler portfolio, considering the Consumer Tech sector (Meet Our Portfolio | Antler, n.d.-b) and 165 companies in the Techstars portfolio, considering only startups founded

between 2017 and 2021 in Europe operating in the practice area consumer goods & retail (Portfolio: StartupCompanies We've Grown | TechStars, n.d.-b) to fulfil the criteria of this research were identified. That's why, a deeper analysis of investors and accelerators was conducted. For that, in addition to the already mentioned, the portfolios of CDTM (CDTM, 2023), Cherry Ventures (Cherry Ventures — Portfolio, n.d.), and Earlybird (Portfolio - Earlybird, n.d.) were evaluated. However, as no data on the product development approach or the 4 success measures was publicly available, this approach was extended to startup databases. For that dealroom.co was identified providing information about 2 of the 4 in this thesis analysed success measurements. That's why, in the next steps all Consumer-focused startups from Europe that were founded between 2017 and 2021 were collected. Then, these startups were broken down into the sectors that can be summarised under Consumer Tech in the definition of this paper (fashion, home living, wellness beauty, real estate, sports, gaming, music, event tech and dating). In addition, only startups listed in the database with at least \$1 in revenue and \$1 in market capitalisation were filtered. In a final step, this data set was then broken down to startups that were founded by a business founder. In that way, 322 startups with available secondary data, including revenue and market capitalization, were identified (Dealroom.co, n.d.-a).

Discussion

After this overview of qualitative and quantitative findings in the following these results will be used to compare the product development approaches Co-founder, No-code, and Outsourcing for non-tech founders in tech ventures with the goal to answer the research questions for the ConsumerTech industry. For that, the above-described discussion framework will be applied.

Starting with RQ1: **“How do the product development approach Co-founder, No-code and Outsourcing impact market capitalisation, capital efficiency, revenue, and time-to-**

market?” Here, as the quantitative analysis lacks statistical significance, no meaningful conclusions can be drawn, due to the quantitative nature of the success measurements on which this thesis is based. However, the qualitative analysis shows tendencies among the founders. For the Co-founder product development approach, positive tendencies can be identified regarding marketcapitalisation and capital efficiency, while no clear tendency is visible for the factor’s revenue andtime to market. For No-code a strong positive tendency for time-to-market and capital efficiency is recognisable while no tendency for revenue and a slightly positive bent for market capitalisationis identified. Next, for Outsourcing no tendencies regarding time-to-market and revenue are identified, while a clear negative bend in regards of market capitalisation is seen. For capital efficiency mixed opinions are recognized. However, these tendencies cannot be seen as a conclusion for the overall population and therefore not as a final answer to the research question.

For the sub questions 2-5 the qualitative analysis identified the 6 themes Personal, Speed, Cost, Product, Fundraising, and outlook directly and indirectly contributing to the research questions.

Looking at RQ2: **“What are challenges and benefits of the Co-founder product development approach for non-tech founders in tech ventures?”** challenges in finding a Co-founder are identified as the main drawback of this approach. On the other hand, a strong positioning towards external stakeholders like investors or business partners, positive effects on personal well-being and motivation through other people with the same commitment on board and the increased likelihood of achieving a good product market fit are stated as the main benefits.

For RQ3: **“What are challenges and benefits of the No-code product development approach for non-tech founders in tech ventures?”** limitations in terms of feature complexity and productquality, as well as a lengthy process to learn these tools without prior knowledge are stated

as major challenges. Opposing to that, a great cost efficiency and should the required knowledge be available, high speed of development, and consequently the possibility of a quick proof of concept and thus better positioning for fundraising stand out as the core benefits.

Now looking at RQ4: **“What are challenges and benefits of the Outsourcing product development approach for non-tech founders in tech ventures?”** 5 main challenges are identified. First, this approach comes with potential conflicts of interest as well as a missing transparency between the founders and the Outsourcing partner. Additionally, there is missing agility, in making required changes to the product. Moreover, this approach is seen as problematic for fundraising. Lastly, Outsourcing is described as an expensive option for product development. On the other side, when used only for selected steps or features in the product development, Outsourcing can have a positive impact on capital efficiency.

Lastly looking at RQ5: **“What are expected future developments and trends in product development for non-tech founders in tech ventures?”** an increase in the quality of No-code tools is expected, especially in terms of speed of product development and realizable complexity. Consequently, the rise of No-code tools also as a supporting function for technical Co-founders and Outsourcing agencies is predicted. Additionally, this progress leads to the prediction of a decrease in demand for technical Co-founder.

Consequently, looking at RQ6, the: **“How do the product development approaches Co-founder, No-code and Outsourcing for non-tech founders in tech ventures compare?”** While this paper cannot provide a definitive comparison of product development approaches for non-tech founders in the Consumer Tech industry, clear trends can be identified. Firstly, even though each of the 3 product development approaches analysed has different advantages and disadvantages, there is a clear tendency among the founders interviewed towards Co-founder and

No-code tools as the main development approach, while Outsourcing was rather classified as an additional product development approach for specific use case. Additionally, an expected increase in the importance of No-code tools is expected for the Consumer Tech industry.

Following up on this after the analysis of the B2B Software industry these results are compared with previous literature and enhanced by 3 expert interviews to draw further conclusions regarding the research question and to identify limitations and suggestions for further research.

General Discussion

Following the overview of the qualitative and quantitative findings, for the Consumer Tech and B2B Software industry, this chapter aims at comparing the results of both industries with each other, as well as with existing literature. Additionally, 3 expert interviews will be analysed, with the purpose of observing differences and similarities with the previously discussed results.

Both industries presented similar benefits in regards to how founders assessed the diverse product development approaches. Even though no significant discrepancies are recognized, a stronger tendency towards using the No-code approach can be seen in the Consumer Tech industry. This might be because B2B Software requires a deeper understanding of technology, due to its core position in the business, making the role of a technical founder more relevant. However, due to the small sample size and only marginal observed differences, no final conclusions can be drawn.

Moreover, when comparing the industries' results with the existing literature many similarities are revealed. Mainly, the potential of a technical Co-founder to create synergies, the high speed in developing a proof of concept with No-code tools and potential conflicts of interest when working with agencies is stressed intensively in literature. However, also differences between

existing research and the results of this paper were identified. One point, raised in the literature review, and opposed to the results of this study is the statement that solo founders are the most common recipients of Series A investments over \$10 million (Kamps, 2016). A possible explanation for this deviation could be that due to the focus of this work on the first 2 years after entering the market, with 50% of those interviewed being in the market for a maximum of 3 years. With an average time span of 18 months between seed and Series A investment (Dealroom.co, n.d.), it may therefore be that Series A funding is not their current priority. Nevertheless, this can be identified as an interesting point for future research, as even the founders who had already been in the market for more than 3 years classified a Co-founder as beneficial for fundraising. Another difference is technical debt. Although this point is mentioned superficially in the results of this paper, it was analysed much more complexly and as a deeper risk of No-code tools in previous research (OutSystems, n.d.). A possible explanation for this discrepancy could be the clear focus on non-tech founders as interviewees and thus the possible lack of technical expertise. This is an interesting point and clearly shows how important it is to involve tech experts to answer this research question.

That's why, 3 expert interviews, covering the 3 different product development approaches were conducted. It is crucial to note that all the interviewee's statements represent their personal opinion and not the company they currently have a role in. Starting with the Co-founder approach, Nicolai Mokros, Head of the Startup SÜD Hub, a university startup hub which does Co-founder matching, was interviewed. 2 key takeaways from this interview were the fact that trust is a mandatory factor when working within a team and that without communication there might be a big risk of misaligned goals. Additionally, it was disclosed that to create a product in which value is added, a No-code solution should not be followed, since as it is easy and quick to develop,

the solution might not be complex and differentiative enough, being easily copied. Secondly, Andreas Stryz was interviewed, an expert in No-code tools. He is the CTO and Co-founder of FINN Auto, a German car subscription platform valued at more than 500 million euros in 2022 (TechCrunch IsPart of the Yahoo Family of Brands, 2022). One major point referred, was the difference between No-code and Low-code, in which Andreas explained the importance of having basic coding skills to develop a Low-code solution. As a technical developer himself, he believes that No-code-low-code solutions are a great opportunity to build an MVP, test the product and get to the seed stage quickly. However, he also stated the importance of having Co-founders along the process, since in his company, the board was composed by 6 Co-founders, where he performs the technical role. Finally, a client and team manager from a social enterprise which connects skilled workers from emerging countries to reach Outsourcing job opportunities, was interviewed. This Outsourcing firm has a strong focus on the SDGs. This can be seen, for example, in its alignment with SDG 1, as each employee can support on average over 2 families through the income generated, or in SDG 5, with a share of 60%+ women in their workforce. It was also quoted in world-renowned journals and business magazines. Here, challenges of following an Outsourcing approach were shared, such as communication issues, due to different time zones or due to a lack of technical knowledge from the client's side. As no major differences between the industries were identified no further conclusions regarding the research questions are drawn in this discussion.

Conclusion

To conclude this paper, the key findings are summarised and connected to the research objectives. Then limitations are pointed out and finally suggestions for further research are given. This study aims to create a quantitative comparison of the product development

approaches, and to show advantages and disadvantages of each approach. While the findings do not allow for quantitative comparisons, the results hint towards Co-founder and No-code to be seen as the preferred option for the core product development approach compared to Outsourcing. However, there is also a tendency for Outsourcing as a complementary product development approach. Also, a tendency towards a predicted increase in No-code tools and a decreasing demand for technical Co-founders is recognized. This study complements the existing literature, which mainly identifies the main product development approaches, by providing a comparability between the approaches for non-tech founders in tech ventures. Furthermore, 2 interesting contradictions between existing literature and the findings of this paper were identified. First, the contrast of literature ranking solo founders as most successful in Series A fundraising, while the results of this analysis hinted towards Co-founder being the most promising approach regarding fundraising, and secondly, the smaller recognition of technical debt as a challenge for No-code compared to existing research.

Limitations

However, when concluding also limitations must be considered. Limitations can be recognized for the quantitative analysis. The small sample size, due to time constraints and missing premium access to databases must be seen as limitations. In addition, due to the non-probability sampling method, the generalisability of the results for the target population must be critically questioned for both the qualitative and quantitative analysis. It must also be noted that this study only analysed the Consumer Tech industry in Europe and therefore no conclusions can be drawn for the entire tech startup ecosystem. Finally, the choice of success measures should also be seen as a limitation, as a selection of other factors could possibly lead to a different result.

Suggestions for further research

Building on this, this study can be further developed for future research by collecting more quantitative data to improve the statistical significance. One approach for this can be to use databases like Dealroom.co by leveraging a premium account. In addition, the present study can be repeated for other industries and with new success measurements. Furthermore, it can be interesting to better understand the background of the contradictions between existing literature and the findings of this work, especially in relation to the different perceptions regarding the product development approaches Co-founder and No-code for fundraising and technical debt. In conclusion, it can be said that, despite imitations mainly due to time constraints and a lack of data, a tendency towards Co-founder and No-code can be seen as the preferred core product development approach. In addition, the question of different views on Co-founder and No-code regarding fundraising can be seen as an interesting basis for further research.

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Appendix:

Appendix 1: Interview guide

1. Is it okay if we record?
2. The planned time horizon is 30 minutes.
3. Is it okay if we transcribe our recordings for the thesis and add them to the appendix?
4. Do you want the data to be anonymized or can it be connected to your / your companies name?

1. Can you provide an overview of your startup, its core product, and the industry? (1 minute)
2. How did you approach the development of your core product and what was your role in that development? (2 minutes)
3. What other approaches did you consider and what was the 1 main key aspect for your final decision? (2 minutes)

Other possible options could be to create the product together with a Co-founder, to create it individually by yourself or in cooperation with external service providers.

Now we want to specifically understand how your decisions regarding product development influenced your Startup looking at the factors market capitalization, time to market, capital efficiency and revenue of your company

4. What was 1 main challenge your approach brought, regarding these factors? (2 minute)

5. What was 1 main benefit your approach brought regarding these factors? (2 minute)
6. If you would now start your startup again, would you choose a different product development approach? (3 minutes)
7. Do you anticipate any changes in product development in your industry? (2 minutes)

Comments:

Mapping:

1. When was your Startup founded
2. What is your educational background?
 - a. What?
 - b. Highest level of education
3. What type of product is your core product? (Software vs Hardware vs App or other)
4. Do you want the data to be anonymized or can it be connected to your / your companies name?

Appendix 2: Interview 1

Interview participant: ID1

Interviewer:

Just also to get all the bureaucratic stuff out of the way, we would use that interview for our thesis. So, is it okay for you if we use the things and also the transcription of the interview for our thesis then and publish it in the end?

Interviewee:

Yeah, probably yeah, refrain from saying anything that I wouldn't want to be published then. I think it's all good.

Interviewer:

Okay.

Interviewee:

It's not too secret.

Interviewer:

Perfect, perfect. And you can also choose in the end of the interview if you prefer that it's anonymized so it can't be directed to your company or whether it's with your company name, however you prefer. So then let's kick it off. Can you just in the beginning give us a quick overview of your startup? So, what was the core product you were building and also the industry you were operating in just like a minute or something?

Interviewee:

Sure. So as in the old companies or the current company?

Interviewer:

As you prefer, like the one way is say you would have more to share about product development so far. So I don't know how far you are in your current company yet.

Interviewee:

Yeah, we'll do current one because previous one I wasn't really involved too much. I was more on

the pure kind of sales, marketing side. But yeah, current company. So it's called (Company name anonymised for confidentiality reasons). It's a social membership designed to help bring people together in the real world by recommending the best bars, restaurants, coffee shops in your city and providing every member with a discount if they go to that venue at the same time. So for example, if you go to the bar that we recommend, so like the bar of the day, you get two free drinks if you go there that evening. So it's a way to not only save money, find new places but also meet new people as the members go there at the same time. Yeah, do you want me to go to details?

Interviewer:

I think for now this is really good. Just one more thing, to which industry or industries would you put that startup?

Interviewee:

Yeah, that's a good question. So it's hospitality, tech, I guess. And we touch a little bit on wellness because it's aiming to really try and help combat kind of loneliness epidemic that's happening across a lot of countries in the world. So yeah, it touches I think on those three things.

Interviewer:

Nice, nice. Thank you. So you're now into product development and so for your core product, how did you approach your product development and what was also your specific role in that development process?

Interviewee:

Yeah, so as a solo founder, I basically did everything myself. So I assessed multiple options to begin with. So we've developed an iOS and Android app. So, I basically assessed this, well I see three main options for me to go with at the start. One is I get a co-founder who's a technical co-founder who's a developer who can basically work on the app straight away and can do most of the building within the co-founder partnership. So that was one angle. Second angle is look at agencies,

development agencies that can build everything for you from start to finish. And so that's the second one. The third one was then I looked quite heavily into doing as much of it myself. So I guess either learning to code myself or learning to use these new tools which are no-code solutions which is what I ended up using which can allow you to essentially build an app or build most of the app yourself without any lines of code at all using a platform which I end up using called FlutterFlow which is basically a platform made by the people behind Flutter which is like an engineering language used to make apps. So yeah I basically chose the third option because the first one I didn't want to give away a lot of equity to find a co-founder that can develop the app. The second one I didn't want to do because it's very expensive to do at the start and I knew that my app wasn't the most complicated app in the world or that it's not the most complicated technology to make so that's why I set it on the third one which was the most cost effective, the quickest I guess because I could just put all my time into that and I don't have to rely on anyone else to use their time and yeah that was kind of the reason I went with the third one. There are some negatives I guess to the third one which is trying to do most of it yourself which is you hit a certain, depending on the product of course, I hit a certain level of expertise that I could do myself with the app which I then had to outsource some part of the project to an agency to finish the kind of back end development. So basically a lot of the front end engineering I did through this platform and myself with the back end so connecting the app into a database system that could authorise users to be able to enable them to redeem drinks in certain bars and track all of that. I needed some help to make sure that all of that worked really well so essentially I got an agency to help with the back end development of the app but it was far cheaper because they only had to just do a very small amount instead of having to do everything. And then I guess the process for finding that agency, how I found that agency was through the platform that I used so FlutterFlow, they recommend agencies that are like FlutterFlow experts who are experts in building these kind of no code apps and I basically partnered

with one of the top ranking ones on their recommendations and it was based in South America and it was really cost effective and they were really good and I'm still working with them to this day. So yeah I guess in terms of timelines as well might be helpful for you. I started working on it around March of this year and within five months we had a lot of apps like a fully working app launched in (City name anonymised for confidentiality reasons). So pretty quick turnaround which is another benefit of the no code solution.

Interviewer:

That's nice thank you. You also immediately touched on the next question because the next question would be about other approaches you considered so you touched already on thinking about a technical co-founder or doing it fully with an agency. If you really shortly just in one minute could name us like the number one key aspect which made you go then for the approach you chose?

Interviewee:

Yeah so I think two things. One is like retaining control and the ability for me to like utilize my time more effectively I guess and then I think that the major one to be honest is cost like it was just way cheaper. To do that initial MVP I'm not saying we're going to end up using this app for the next five years but to get a founder to get your start up to like a point where you can raise enough money to then build the app properly. So building an MVP is what you took normally longer. This was the fastest, quickest, easiest way for me to get to an MVP so I can start to generate revenue so that I can then use that to raise money to then build the app properly which is more scalable. Because that's usually like the process you should be thinking of is how do you build the MVP as quickly and as cheaply as possible to enable you to make revenue as quickly as possible. A lot of people fall into the trap of investing like hundreds of thousands of euros and lots of time trying to build an MVP and they don't even like they almost the company fails before they even build the MVP because they've spent too much money and too much time and wasted too much time. So

yeah, that was kind of the reason I guess cost and time with the two main factors.

Interviewer:

Yeah, that's nice. That's nice. Just a quick heads up for you. After time we would have now two more blocks. The first, the next block would be to quickly look into challenges and benefits and then we have two final questions about a future outlook. So now to get into the next block. In this block we want to understand how your decision influenced the performance of your startup so far and looking at the factors of market capitalization of your company, the time it took you to get into the market, the capital efficiency and also the revenue of your company. So first, the first part would be what was and one main challenge your approach brought you in these things. So regarding these four factors, what was one main challenge you faced?

Interviewee:

So it was quite a long-winded question. So sorry, challenge for market capitalization or the other four?

Interviewer:

Time to market, capital efficiency and revenue.

Interviewee:

I mean there hasn't been too much for those four things. There hasn't really been much challenge. The biggest challenge, I don't think it's that related to any of those fours, is just like the drawbacks and some of the features I've had to not do because the app is a little bit more basic because of the approach I took. So I took some kind of, I cut a few corners to be able to build the app using this technology and to launch quicker so I could generate more revenue which then led to me being able to raise more money more quickly. So like it's actually led to a positive thing and all of those four things that you said. Does that make sense?

Interviewer:

Yeah, sure. But it would also immediately lead us to the next question because it's exactly the other way around. If you can break it down to the main benefit, what was the main benefit and your approach brought you if you were looking at these four factors?

Interviewee:

Yeah. So I guess benefit number one was speed to launch was very fast. Therefore I've managed to prove the concept very quickly. Therefore I've spent less money because essentially every month you are not launching, you're wasting a lot of cash. So it's meant that I basically got to profitability much faster going through this route which then means it's easier for me to raise money especially in this current climate because I've already had three or four months of revenue. I've got profitability. Therefore I've managed to raise money far quicker. If I went for one of the other options, let's say going for an agency, I probably would have spent four times more and not guaranteed to launch any quicker and therefore I would be unprofitable for longer. Therefore it could be harder to capitalize to raise money. So yeah, it's been posted in all those four things. Okay, that's nice. Thank you. And now we would especially focus on all three options you touched already. So the co-founder, the agency or the approach you use. And if you think now back and would start your startup again, would you choose a different development approach or would you follow exactly the steps you took?

Interviewee:

Yeah, I would do exactly what I've done. What else would I change? No, I think regarding the development side, I wouldn't change a lot. The only thing I'd potentially change is the agency that I ended up using. Maybe I could have vetted, I could have researched a bit more and asked a few more other agencies that could have been better. They're good, but they're not incredible. But that was again a decision just based on time and wanting to get things done quicker. Yeah.

Interviewer:

Okay, now the last question. Do you anticipate any changes in product development in your industry? So you talked about hospitality, tech, consumer tech in that industry. Do you see in the next years and product development changing? How it will be approached? So when you say product development, like to again refer to how an app is built, how it's engineered, exactly.

Interviewee:

So how the market is changing?

Interviewer:

Not necessarily only on an app, but in general how the products, especially the technical products are built, so apps, softwares and so on, also hardware product if needed. But for you, I think you can mostly refer to an app.

Interviewee:

Yeah, I mean hospitality in general is essentially going from analog to digital and then to the cloud is like the movement over the last five or so, five to ten years. It's actually one of the sectors which is lagging quite far behind in terms of technological development. So there's still a lot of businesses running off very old systems, running their restaurants, bars. People still use like stamp cards, like physical stamp cards in coffee shops for loyalty, for example. So there's been a hell of a lot of interesting new tech around how apps and the cloud systems can be built to automate loads of things and track everything. Is that the answer you're looking for? I'm still a bit confused.

Interviewer:

Yeah, we're looking especially for the next years also, if you anticipate any changes for the next years.

Interviewee:

No, I think it's just a further adoption of technology to make it easier to run your business. So just using more apps, using more cloud-based solutions that mean you can control your business more

easily from anywhere, remotely or whatever. Yeah, and moving away from cash as well, that's obviously quite an obvious one.

Interviewer:

But going back to product development, you don't anticipate any changes of more people going with a Co-founder or more people using no-code tools?

Interviewee:

Yeah, I think let's ignore hospitality because I don't think the question is really relevant to one particular sector. In terms of startups in general, we should be talking about. Yeah, there's a huge trend over the last couple of years and it's getting more popular for solo founders to build a lot of things themselves. There's a lot more use of AI and no-code solutions to mean that people like myself who aren't technical can build things far quicker and actually go without a technical co-founder for a lot longer or go without a full-time engineer for a lot longer than they used to. Like five years ago, that wouldn't even be possible. And that's only going to get more and more popular as these products get more and more powerful. So yeah, the trend basically is there's more solo founders than I think there's ever been before because the technical co-founder is less valuable than they were five years ago or even a couple of years ago because AI, because no-code is getting way more useful and way more easy for me as a non-technical person to use. So that's a really important trend.

Interviewer:

Perfect, perfect. Thank you. So everything from the questions then, just the last thing to wrap it up, how would you describe your background? You can say the subject you started or in general the background you're coming from just for mapping reasons.

Interviewee:

Yeah, so study business, so I've got a business degree and always been a kind of sales marketing

creative kind of businessman I guess, an entrepreneur. So yeah, never studied any computer science or engineering or anything like that.

Interviewer:

Perfect, perfect. And thank you a lot for taking the time for the interview. Very nice insights.

Interviewee:

No worries.

Interviewer:

Thank you and then we'll send you the quantitative survey if you could answer that then after the interview.

Interviewee:

Sure.

Appendix 3: Interview 2

Interview participant: ID2

Interviewer:

So can you in the beginning provide us a short overview of your startup especially with a focus on your core product and also the industry you're in here you can be really really brief just like maximum one minute would be enough for us.

Interviewee:

Yes okay I try to keep it brief what we are doing is maybe first we do B2B and B2C I think in terms of because you mentioned that the tech background is important then maybe it's better to talk about B2C because they're the tech part of the year so we developed the app and here we do like one simple eco action every day where we just mobilize the users to do something good for the planet and then you see how many people did the same action on the same day and that's how we want to help people do not feel alone while they are doing something good for the planet and just having this positive feeling while doing climate action and then we of course also complemented with positive climate news that's all about being not negative and not having those booming news about climate change but switching it to the positive side and really giving people the energy and the motivation to do something together.

Interviewer:

Perfect and to which industry or if you want you can also name us a few if you think it fits to more industries would you put yourself with that company?

Interviewee:

Yes I would say it's a climate tech startup if that's an industry for you.

Interviewer:

Definitely. We're considering areas like climate tech, sustainability, green tech I think these are the areas where it would fit great and now to the product development and how did you approach the

product development now especially looking at your core product so I guess the app you talked about and what was also your role in that whole process?

Interviewee:

Yes that's interesting because we are three co-founders and the other co-founder of mine we all have business background so nobody of us is in any tech background and there was also the core issue in the beginning and how we did it is that one of my co-founders he's called (Name anonymised for confidentiality reasons) maybe it's easier. (Name anonymised for confidentiality reasons) started the whole startup and he initially just taught himself programming via YouTube tutorials and just really basic stuff so he didn't have any knowledge in how to program an app and so he just learned it on himself and then we together launched a prototype which was basically just based on his basic programming skills and that was also why the prototype was looking really shitty but it had the main function of doing (Anonymised for confidentiality reasons) and that worked out and then we used this prototype to just test the whole concept and we reached quite a lot of people so I think in the beginning we reached like 10,000 users just without any paid advertisement just by social media and that was then when we decided okay somehow we want to bring it to the next level and then also our technical skills failed because none of us has technical background and then because we had this kind of proof of concept we then decided to commit to pay an agency to actually program the app properly and also add many more features and what we did here is that we took over the whole design and features part so we used Figma and Adobe just to build the whole concept of the app and also the screens like the interface and then work really closely together with an agency that then developed the whole app which was kind of iterative because we had contact with them like every day like almost every 10 minutes of via WhatsApp so it was quite a collaboration so not that we paid them once and they did it but it was really a process of back and forth all the time.

Interviewer:

Great, great and did you also consider other approaches or what other approaches did you consider and for the beginning of the start-up and what was then the one main aspect the key aspect which brought you to the final decision to approach it in the way you did it?

Interviewee:

Yes I think we definitely also considered also still right now we consider to take a technical person on board however this is super hard to find the right person that can especially for apps can program apps for iOS but also for Android because it's completely different and then also there are so many different variables especially for Android where you have to be really skilled to master like those different interfaces you have and that was also where we struggled a lot so we were definitely looking for somebody who has technical skills also right now to just add features and have small changes to the app how it is today but there we actually failed to find the right person because it is of course there's like a lot of platforms out there where you can just say that you're looking for a co-founder or for technical support and we also looked into those but honestly we didn't see or maybe we didn't put enough effort into it but we really didn't find somebody immediately so we stopped it and we also saw that it works quite well with the agency however in the long term it's still definitely needed to have a technical person on board.

Interviewer:

Yeah make total sense and just one clarification like until which point of time did you create a product alone with your co-founder and in which point of time did you decide to switch to the agency?

Interviewee:

Yes and I mean in terms of the timeframe we started in 2019 or my co-founder started in 2019 like end of 19 and then we joined forces in 2020 and at the end of 2020 we reached like 10,000 users

with just the shitty prototype and then we decided to get okay it makes sense that our concept is now proven that we actually take money and invest it in the app to develop it with an agency and then we kick that off in the beginning of 2021.

Interviewer:

Yeah okay just to get a quick overview so you more or less develop one year the product alone and after one year you get an agency on board.

Interviewee:

Exactly.

Interviewer:

And now for the next type of questions you already mentioned but you create your product with a co-founder and you also already mentioned and but at some point you got an agency on board and but another aspect and which could be considered would also and be to create it completely yourself so by using no-co-tools for example or by also as (Name anonymised for confidentiality reasons) did learning everything yourself and now we want to understand a little bit more and what do you think where you performed really good or really bad in comparison to these other options and for that we want to look at four specific factors so we try to understand how your approach to product development influence your success and looking first at the time to market so how long it took you to get the product into the market and the market capitalization of your startup and your revenue and also your capital efficiency. I know that was very complicated so I think I give you a second round the four factors you would look at would be first time to market then market capitalization revenue and also your capital efficiency and you don't necessarily need to comment on all these aspects if you only have four some one or two it's also totally fine.

Interviewee:

Yes okay so you can remind me later of the other of the last two factors again. First one the time

to market.

Interviewer:

Yeah maybe sorry to interrupt but maybe we can frame it in a more easy way just in general you now have these aspects what would you say was the one main challenge your personal approach for product development brought when you look at these four aspects like what was the challenge you got.

Interviewee:

Oh my gosh that's now difficult because I'm kind of confused with the four factors. If I should I answer the question without the four factors in mind and they are just indirectly considered. Okay so the major challenge with our product development in thought was definitely to be as agile as if we would do it on our own because of course we had to coordinate a lot and then you really have those on the one hand you have like those conflicts of interest and on the other hand you also can't really read the mind of the designer for example of the agency and also of the developer then it's not 100% clear if they can't actually perform the task because it's technically not possible or if they actually don't want to because it's too expensive or they don't have the skills so that is kind of hard to know if you don't have the technical expertise to really see if it's working or not that was definitely like this communication and transparency aspect was definitely the hardest challenge.

Interviewer:

That's great to know, great answer I think. And turning it around now what would you say was the main benefit you got from your approach?

Interviewee:

I think there is definitely the time aspect because if we would have learned it or learned programming on our own then it would have took us like so much longer especially because it requires like different programming languages for the different operating systems and I think it's

definitely the time so as soon as you pay somebody they do it as fast as possible but learning on your own takes longer.

Interviewer:

Okay great and now we would go into a little bit more hypothetical questions so there are two questions to finalize the interview. The first one would be if you would now start your startup again would you choose a different approach to product development and what would you do the same and what would you do different?

Interviewee:

That's a good one. It's let me think for one second if...I think we could all agree like me and all my co-founders that we would ideally choose a different approach because it's always better to have the skills on your own. Also as you mentioned mentioned in terms of the market capitalization that we as a founding team are also perceived stronger and more independent of other outsourcing agencies so it would definitely be more beneficial to have the skills on our own and that is also something we would probably do different to maybe start early on before we even have the prototype to look for the technical person that is on board from the very beginning and doesn't join later when we are already kind of an existing founding team that is quite strong and already deeply into the product development.

Interviewer:

Interesting, interesting, thank you. And the last question would be do you anticipate any changes in product development now specifically looking at your industry but if you want you can also give us some general thoughts. Do you think product development in the next years in a short time horizon looking into the future will change? This question comes from the background of with new technological advancements or other changes in the market might also change.

Interviewee:

The approach and how found successfully developed the product. Do you mean in our specific case or in general for everyone?

Interviewer:

Mainly looking now at the green tech sustainability industry and so not only narrow down on your start up but in general over the whole industry.

Interviewee:

Yes, there I'm sure it will definitely change because now also like AI and like those internet-based applications are much bigger and much more advanced that you can really also create like a prototype and I don't know a day instead of learning how to program in several weeks. So I think it definitely changes it makes things like that much easier and also the idea generation or idea creation of startups or products in general will change a lot because I'm sure on the one hand I'm sure we will have much more ideas. But on the other hand why are by using for example chat GPT probably the ideas we have will be much more similar to ideas people on the other side of the world will have because we will just use those kind of applications or AI programs to help us refine the idea. Then we get the same suggestion for maybe similar but still different idea. So in the end probably everything kind of converts into something similar which will definitely change product development because we rely more on outside idea generation than just on our own.

Interviewer:

Okay, if you connect this now to the different approaches we talked about. So going with a technical co-founder and using an agency or doing it individually by yourself and do you also expect changes in the distribution of these factors?

Interviewee:

Good question. I think it will for using an agency. It will definitely also change because it will probably be much easier to find the right agency because it's easier to match different interests with

like advanced technologies like AI and also all the platforms we have. And the same for finding a technical co-founder. I mean the platforms were also existing when we started so it's not like it hasn't been there but probably it will be easier to match those people as well because the database and also the search algorithm will be much more effective. And learning it on our own is the same. I think like AI is actually changing everything because I think we also, how's it called? I don't know the name, what is it? Study AI or something? So you just ask a question and then it gives you like a whole program or a whole course with introduction, like advanced knowledge where you have different levels and go through the levels to learn about any topic you want. So you can just create your own e-learning so it will be much easier to have tailored an individual learning for example programming in-app or doing anything else that you want to do.

Interviewer:

Okay, great. Thank you. That would it be from the questions now? We just have three super fast quick short questions for mapping. The first one would be when your startup was founded in which year? I think you already mentioned it was 2019, correct?

Interviewee:

Yes.

Interviewer:

And then to your education and background can you give us just a quick answer in what field you studied and also what is your highest level of education?

Interviewee:

Yes, I also studied business. I did business administration at LMU in Munich in my bachelor's and now I'm in my master's in Copenhagen at CBS in business development and innovation.

Interviewer:

Nice, nice. And the last one would be what type of product is your core product? Here we're looking

mainly into like is it a software, hardware or an app? I think you already mentioned it's a mobile app for B2C customers and for B2B it's a software or what is it for B2B customers?

Interviewee:

Yes, for B2C it's a mobile app and for B2B it's actually it's mainly based on emails and then also like calculations and Excel and a lot of programming in the background but the customer facing technology is mainly emails.

Interviewer:

Okay, okay. So that would it be. Thank you so much for taking the time and now it's just after you decide if you want to have it anonymized or not.

Interviewee:

You can use the name the company and of me.

Interviewer:

Okay, perfect. And thank you so much for taking the time and after the call like in the remaining time of the day we would also send you a short link of a survey and a quantitative one.

Appendix 4: Interview 3

Interview participant: ID3

Interviewer:

First question of the interview would be, can you provide in the beginning a short overview of your startup and especially the core product of your startup and also the industry you're operating really shortly, just one minute maximum?

Interviewee:

Of course. Maybe just a very quick question. What's the time horizon for the interview?

Interviewer:

Oh yeah, sure. The plan time horizon would be really, really maximum 30 minutes, but from the experience of how you manage every interview to be wrapped up in 20 minutes.

Interviewee:

Perfect. Okay. All right. So thank you. So getting to your first question, the product of my last company is a social network with the name (Company name anonymised for confidentiality reasons). And its purpose is to allow the users to get an overview over what they have in their wardrobe and use the app as a tool to create combinations from all the fashion items that they have in the wardrobe. And they can do that collaboratively together, a little bit like maybe you and I would work on a Google Doc together, so in the same way they can work in an outfit together. And it solves the problem that they often loosen the overview of what they actually have in the wardrobe. So statistically, people use only 20% of what they possess and 80% of what's in their wardrobe is completely unused. At the same time, there are many, many users sometimes also female users who express the feeling that they would have a full wardrobe, but nothing to wear. So that's, that's of course, it's kind of a funny contradiction. And, but it's an overview problem. So it's really hard to compute hundreds of pieces in people's heads, maybe when they're under time pressure at home, and figure out something good, which actually leads to many of our users telling

us they'd rather buy something new than going through something new. Then going through the trouble of rummaging around in their overcrowded wardrobe, because for them it's so stressful to actually go through everything that they have in there. And I would try to solve this problem for them, because when they use the app, they can, wherever they are in the bus or somewhere they have a lot of time, they can already try to experiment with what they could put together for the next day or a party on the weekend or a wedding, or whatever it is. And do it together with, do this together with friends so they can help each other.

Interviewer:

And it's nice and just to add up on this, to which industry or industries would you put yourself?

Interviewee:

Consumer products, consumer social products. Of course, this has a fashion touch. Still, I would not say we are fashion industry, maybe we are fashion tech. So something in every consumer tech, fashion tech in that area.

Interviewer:

Yeah, okay, perfect. And now to the next question, it's now mainly focused on product development. So how did you approach and develop the development of your core product, and also what was your role in that development?

Interviewee:

So, first we developed everything in-house within the team. And when I started, so I had the idea for the company, I knew I need a technical co-founder. So I was looking for a technical co-founder and also for another operative co-founder, which was an old friend of mine, which has not been a good selection. This is a co-founder, but yeah, so the technical co-founder was very important. And yeah, and so, well, actually none of us had any idea of how to do this, how to go about nobody has ever built a software product. And of also, yeah, we were just starting by reading and talking to a

couple of people. Well, and so it turned out quite quickly that to develop a software product, they need to be sort of say two main branches within a team. One branch that we call it the product branch, and then the other branch is the development branch. And if one would compare this with building a house, then there are also these kind of two branches. So first you have, so to say, the architectural branch, which kind of plans everything very thoroughly. And then comes the building company, who actually builds what was planned out. And it's like in software product development, the building company are the developers, and well, and the architects, all the planning is done by the software product team. And we split ourselves up. So I was kind of getting into this product knowledge, which comprises, of course, also the tons of user research, talking to users, all kinds of things. And my technical co-founder did the development part, the implementation part.

Interviewer:

Okay, okay, really nice. Thank you. And did you consider other approaches or what other approaches did you consider besides going with a technical co-founder and then what was the one main key aspect which made you go for the approach you chose?

Interviewee:

So actually, there was no other approach we considered. And the reason is that we were first kind of out reading and talking to a couple of other founders, and it became apparent quite quickly that it would be dangerous to start without a technical co-founder. And because, like when maybe bringing a car to the service shop, to the garage, if there was uncertainty about the integrity of the co-founders and this and that is broken, but if you don't know it, theoretically, they could tell you everything. And then even I think much more extreme, to a much more extreme degree, this is the case in something as complicated as product development. So this was really something we, so that was very, very clear, up from.

Interviewer:

Okay, thank you, thank you, I understand. And now for the second part of the interview, the goal is really to understand how the decision for you to create the startup with a co-founder influenced the success of your startup, especially in the first two years. And for that, we try to understand how it influenced the factors of the market capitalization of the company, the time to market, so how long it took you from starting to develop the product until you publish your capital efficiency, so how much money you burned on the way and also the revenue. I know it's really complex scope now, but just to give you a quick heads up, the next questions would all aim towards these four factors. So it would be just to give it another round, it would be time to market, market capitalization, revenue and capital efficiency. Okay, and the first thing I would try to understand is what was the one main challenge your approach brought you regarding these factors, so did you have any challenges which the co-founder brought you if you look at these four aspects?

Interviewee:

So is the question if the fact that I had co-founders was leading to some additional challenges in these areas?

Interviewer:

Exactly.

Interviewee:

I mean, I think first I would say that it would have been impossible to build this company without a co-founder. I think like for all of us, so none of us could have built the company without the other. So it's a binary, so we just wouldn't have gone anywhere without the co-founder. And main goal, the essential goal for us initially was to of course to bring a product out, but then to get this product to product market fit. Because I think even 99% of all the products which are built and released don't have a product market fit, so nobody wants to use them, so they just fail. So I think this is getting to product market fit was the core thing that we kind of needed to achieve. Well, but

now getting to, so the question for me is hard to answer because for example, time to market and capital efficiency. Okay, time to market, I think like without a co-founder, we would have never gotten to market. And it took us to really get out to market with a releasable product, I think it was one and a half years. And most of this time, like the first 12 months of this time, we were kind of bootstrapping without any funding. And that was, of course, therefore very capital efficient. So it's something that we couldn't have done if we would have needed to pay somebody, right? So either an employee or a freelancer or an agency. So yeah, so therefore like having co-founders was essential for capital efficiency in that sense.

Interviewer:

What you already touched on because I know would be to create a company and either like completely by yourself if you really learn everything by yourself and maybe use them help like no code or no code tools. Or as you mentioned to create the product with an agency or other external service providers, if you compare now your approach with these two other approaches, would you say that there was one negative aspect your approach brought you in comparison to the other ones?

Interviewee:

No, not to compare to the other ones, because I mean, sure, you can say if you're building the company alone, so if you really have all the skills of building your company alone, then you can take all the decisions alone. And therefore you have maybe potentially less arguments, so to say, internally. On the other hand, could also be that you then take wrong decisions just because you never have any arguments with somebody. So this is hard to say, but of course, like decision-wise and so on, if it's just about speed of taking decisions, which it isn't, it's about the quality of decisions and the speed, it's a mix of both, but it's the quality then. I personally believe that, yeah, it's ideal if you can do it alone, that's perfect, but I think it's rare that some person really has all the qualifications to go about it. It happens, but I think it's rare.

Interviewer:

Good, thank you. And to turn it around, you already touched now a lot of positive aspects of Co-founder, but if you need to choose one main benefit, which one would you say was the one that Co-founder brought you the most positive advantages?

Interviewee:

Well, to have somebody with the same amount of skin in the game. So, ideally, a co-founder is each or if there's a company and they're one or two or three or so co-founders or four, I don't know, each co-founder should be like the turbine on a plane. And so meaning it's really the thing that propels the thing forward with full thrust and always in the right direction. So that's how it should feel if one would have the right co-founders. It's really the thing just goes forward with tremendous speed and the best possible qualities. So, yeah, so I think I think the advantage is it's really skin in the game and you have people that work with you in the same intensity, hopefully, as you do yourself.

Interviewer:

Okay, thank you. And now to wrap up the interview, there would be two more abstract questions to end it. So the first one would be if you would now start your startup again, would you choose the same approach to product development again or we touch now on the agency and on the possibility to do it alone? And would you maybe take some parts or maybe the complete product development in a different approach?

Interviewee:

I could now imagine it because now I know a lot. So this is a big difference to my starting my first company where I think it would have been suicide to do this alone. And now I can imagine it and still I think I'd prefer to have at least one person to do this with me because it's also it's tough, can be lonely at times and it's I think it's really cool to have a body to do this alone. So it would

definitely be much faster and to have somebody but I would also say I would only so my big learning is it matters of course like usually which co-founder and it needs to be somebody who's of the highest on the highest possible level when it comes to intelligence, knowledge, drive energy and also very important integrity. That's extremely important to integrity. And I would I would rather do it alone then start a company with somebody who is not at this extreme high level that somebody needs to be. This is something I really learned. I would never ever if I just have the slightest doubt that that's not the kind of calibre needed for this ride. I wouldn't do it. I'd rather do it alone.

Interviewer:

Nice insights. And the last question would be do you anticipate any changes in product development especially now looking in your industry but if you want you can also answer that a little bit more generally. This question comes from the background that in it do you think for example technical advancements or something else will change how product development will be in the next years.

Interviewee:

I think that it potentially become especially at the right now in the face where we are right now. It's an interesting phase where many things can be done with lower costs and less personal than maybe two years ago, which is I think a huge, huge chance right now for starting a product. It's a huge leverage I think all the all the kind of tools that are around. When it comes to coding when it comes to when it comes to planning and maybe generating content and everything else. I'm not sure how this will look in two or three years because then maybe also the complexity of the products the market expect will have risen. And then maybe it's the same thing as today you know where it's really not so easy to build a very complex product and compete with large corporations that have kind of much more resources to build complex products as complexity gets higher and higher right.

It's still possible for small teams to compete on complex products and happens all the time but I think it became harder.

Interviewer:

Okay, very interesting. Thank you a lot and just for mapping it would be three demographic questions. So do you have the year your starter was founded?

Interviewee:

2014, In fact.

Interviewer:

And what is your educational background so and in which field did you study and what is your highest level of education.

Interviewee:

So I studied law in Germany and made a first Staatsexam. Then I stopped pursuing law and decided I never ever want to see or touch law again in my entire life. And I then studied business psychology in in in in Austria and Switzerland and made a PhD there. And that is something that I found very interesting and also quite helpful for product.

Interviewer:

Okay, and your product is it an app or software or like it is it is a mobile app.

Interviewee:

I mean it is software right but it is mobile software.

Interviewer:

Okay, but it's not a B2B software .It's a B2C mobile app.

Interviewee:

Exactly. It's a customer facing B2C product.

Interviewer:

Thank you. And do you want the results to be anonymous in a thesis or can we put them together with your company names?

Interviewee:

Um, good question. But it doesn't make any difference if like I would say maybe anonymous. I would say maybe anonymous and or yeah, just put them anonymous, I think.

Interviewer:

Yeah, no, perfectly fine. Thank you.

Interviewee:

Then my pleasure. Can I maybe like state a warning?

Interviewer:

Yeah, sure.

Interviewee:

Or something because I think I think that it's very hard to understand for somebody who wants to go and build a product that it's not just about doing it and building it and then it's there and then it will work. It's super complex to do it and execute it in the right way and because you can build if you have the perfect idea for a product, it might be a huge success, but you have a thousand ways to build it and only one of those ways might be exactly the one that works. It's very, very, the execution is really complicated, and this is why an agent like using an agency not really works because you need to iterate so much. You need to tune it so much. You need to put so much work and knowledge into it. And most agencies never build a product that really works on the market. They are only they only take money to build something, but then they're not responsible for does it ever work on the market. And if they could build something that would work on the market, which is again extremely complicated, then they will probably do it themselves because would earn them much more money than running an agency, right? But of course, the risk is much higher. So

therefore, all agencies will always take all the money from whoever wants them to build something, but there is almost nobody in the agency business who's really capable of delivering a product which will work on the market. And also, if it would also be much too expensive, probably to do this with an agency because you would have to run tons of iterations. It's not enough to, you know, just build one version of a product and release it. Probably have to change it constantly for half a year with the and this is also a very complicated process that requires tons of know how. And I just want to protect and prevent from people running into this and throwing money at agencies and then kind of end up frustrated after a year or so with which just having thrown money out of the window and nothing, nothing works, right? And there's nobody really telling this to people or unless they really dig very deep into the matter and read and so on. But yeah, that's at least like my take away. So the question is, if somebody has a lot of experience, then they can start working with agencies.

Interviewer:

That's really, really interesting. Thank you.

Appendix 5: Interview 4

Interview participant: ID4

Interviewer:

So, just quickly again we transcribe it and we put it into the appendix, okay? Okay, so I'm sorry we would also need to then quickly go through the first question again and can you provide us a short overview of what your startup is doing, especially core product and also the industry you put your startup to just in one minute?

Interviewee:

Yeah, so the core industry of the startup is shared mobility, and the main business of the startup is to provide an app where owners of e-codes of different types can share them with drivers. So this way we make better use of unused assets like cars, motorcycles and recreational vehicles in a way that car owners, private car owners can share ownership costs when they are not using their vehicles. And the business is like a new business support.

Interviewer:

Amazing, thank you, thank you. Just for the industries again, because some other industries we always consider consumer tech, sustainability, AI or also enterprise software. From these industries would you also put yourself into one of these?

Interviewee:

We are making use of some AI and well marketplace of course.

Interviewer:

Okay, but no consumer tech or sustainability?

Interviewee:

Well, sustainability of course because we do have a strong impact because thanks to our service we reduce the number of cars that are used and also we are able to share assets.

Interviewer:

Okay, perfect. And now to how you approach the development of your product. And the question would be how did you as a company approach the development of your core product in the beginning of the company and what was also your personal role in that?

Interviewee:

Okay, the question is not super clear to me, so could you please reframe it. So I just want to be sure that I will give you the answer you are looking for.

Interviewer:

Yes, sure, of course. Because in the beginning of a startup you always have different ways of thinking about how you want to create your product, especially if you can't unite everything in yourself. So the question would be what did you as the company decided to do and also what was your personal role and especially in the product development?

Interviewee:

Okay, so my role was to have like I had the original idea because I had this problem in dealing with car rentals. So I wanted to use car rental services but it was always quite difficult and a cumbersome like user experience. And so that's why I just said hey why we don't create something better who had people have better access to car rental services. And yeah, so I had this initial idea. I start working on some market researches first to understand if like the business idea made any sense and from there I start developing the concept.

Interviewer:

And now into the technical development of the product, did you also do that yourself?

Interviewee:

No, so I am not the technical founder. I had the first technical person with me even though this person was not the technical was a web designer. So thanks to (Name anonymised for confidentiality reasons) who we designed the first website, the first pitch deck, I produced the

content and he did the design and after a while we had the first team working on the technical part.

Interviewer:

Okay, so you didn't use any external service providers or you didn't have a clear technical co-founder or something like this?

Interviewee:

No, we did have a technical external contractor because at the very beginning it was me and this guy mentioned but he was a web designer so he was just able to design the landing page of the website. But of course the service relies heavily on technology because we do have the app, we do have the platform and also it's way more complex than justice but the basic idea was to have an app. So we needed to have also technical resources on board and we didn't have this capacity. So we started cooperating with a team of developers and this was after two years I had the initial idea and the experience didn't go well so we had to start again for a second time. It didn't go well either, the second time and only the third time as well, always using the aid of external contractors.

Interviewer:

Okay, great. And did you consider any other approaches except of using the help of external contractors and what was then also your main key aspect which made you go for the external contractors?

Interviewee:

It's quite difficult to develop this type of products and so you need more than one person, expert in technology to develop an app. Unless you are talking about probably a super senior world class developer so you need at least three or four different types of experts to be able to do together a simple app. And that time was quite impossible for us to find these people and also it was quite impossible for us to find a proper CTO that could have developed the technology. So the only option was to put some money together and to rely on the whole curve of a contractor that could

have done at least the initial part of the activity.

Interviewer:

Okay, get it, get it. Because other options we often hear where as you already mentioned the external contractors but of course also going with a technical co-founder also doing it completely individually to develop the technological product. For example with no code or no code tools and for the second part of the interview we would now focus on comparing always these three different methods. So the technical co-founder, the individual work with no code, no code tools and the external contractors. And for that we would first like to understand what was one main challenge your approach brought you. So what was one main challenge and going for external service providers or contractors you think you might have not faced in one of the other approaches. And just to give you some more background so you might have a little bit of direction where to go. We tried to understand where you had problems looking into factors like, let's wait one second maybe. We're looking into challenges which made it hard for you into achieving great in the factors market capitalization, time to market, capital efficiency and also revenue of your company. So to give you a second round and where did you face challenges regarding market cap, time to market of your product, capital efficiency and revenue of your company because you decided to go for external contractors.

Interviewee:

Okay, I missed a few words. I don't know if the line again is breaking on my side. Anyhow, I think I got it. So the problem, like the challenge we faced in using a contractor is that you need to be sure that your interest is aligned with the interest of the contractor. And most of the time this is not true because the contractor wants to, do the minimum they can for the money you pay and with the lowest quality and the quickest as the speed as possible. So they don't have to spend time on it. While of course you want to spend your money in a way that you will have the maximum quality

and output you can achieve. Are you still connected, right?

Interviewer:

Yes, I'm listening.

Interviewee:

Okay, perfect. Yeah, so this is the biggest problem that people have to mitigate when dealing with external contractors. And our inexperience led us to make this a mistake two times. And so the third time we really had a very good contract when we signed in with the third contractor because at least we learned how to first apply. And that was really great. And the second time we did this is by picking a good contractor and having a good contractor, you can really maximize the output and at the same time benefit of the experience of the contractor while managing the risks of dealing with early stage technical things.

Interviewer:

Okay, great.

Interviewee:

I hope the answer was in target.

Interviewer:

Yeah, definitely. So your main challenge was what the cost you expected to pay was in the end not aligned with the outcome you expected to get, correct? Yeah, that's one of the challenges. Because the contractor, if you have an employee, this person is making like 1000, 2000 euro per month the same as you give your random number and they will work for you. If you agree with a contractor that they have to develop a very simple app and it costs 50,000 euro, they will try to invest the equivalent of 10,000 euro in the development so they can make a huge gain on the extra that they start. And if they are not fast enough, like for every extra day they are working, they will have to pay 300, 400 euro, you know, to their employees. So they try to maximize the speed and to give

you the minimum, like the, let's say a product that has an acceptable enough quality, which is not the maximum quality you expect as a contractor.

Interviewer:

Got it, got it, great. And now if you turn that question around, what would you say was the main benefit you approach brought you regarding the factors we discussed?

Interviewee:

Yeah, well, flexibility, because then you don't have to hire people or if you are not able to understand technology that is not, then you have the chance to see the progress. It's because if you have to deal with an internal team but you are not able to understand technology, you will never understand why things are not working and 99% of the time things won't work if you are an no tech founder and you don't have anybody with expertise in the team, in the management team. And while if you are dealing with an external contractor, you agree beforehand on some functions for your technology, let's say, and like if those functions are not properly working, you simply won't pay the contractor. So this really gives great flexibility to founders to be able to better manage this risk. And also, I would say it's great because then you can maybe rely on the experience of someone that is developing apps or technology for many years. And maybe if we were dealing with this good company, they had 1500 employees. So in the case, some of them were not able to progress with the development, they always said an expert in the area or in the area of development that could support the people involved with the development of the company. So it's also the team effect I would say that you can benefit.

Interviewer:

No, great. It makes total sense. Thank you a lot. And now for the last two questions, we would go into a little bit more hypothetical questions. So the first one of these two would be if you would now start your startup again, would you choose a different product development approach and

why? So this question aims towards the three different approaches we talked about again, the external contract providers, a technical co-founder and doing it yourself with no-code, low-code tools. And what would you do different or would you go in every aspect the same again? And why would you choose like this?

Interviewee:

Yeah, good point there. Well, I am not sure that someone without any technical ability would be able to put together this by using no-code tools honestly, because a sort of basic preparation is always needed. So I am not really sure that even by proposing this approach, no technical founders would be able to develop anything through that. So it's like to put it in other words like let's say you are not able to cook anything and someone sends you the box with the ingredients and tells you how to do it. So you probably won't even try, you know, because if you don't know how to even like boil the water, you won't probably start. So I see they don't call the tools that are used by technical founders that need to prove that their business idea works with using limited- to-standard resources. So that's how I see no-code tools. So I will simply put them under the technical founder's head. But going back to your question, well, of course, if you are able to find a very good technical co-founder, then go for it, you know, like you would do 50-50, or technical co-founder would design a better, a great product, develop a great product, and everybody would be super happy. The problem is that even like if you don't understand technology and you are an inexperienced founder, how can you even guess that this specific person is a good technical co- founder, no? So there are these limitations, and if I just give you an answer, probably I will go for contractors as well.

Interviewer:

Okay, okay. And you would also not change anything in your approach, how you approach the contractors and how you select or how you work together with them?

Interviewee:

Well, that would change definitely, so I would probably not waste a few years of my life and money because of wrong contract management. So I will definitely use a different approach, more structured contract, clear deadlines, clear expected outputs, clear sturs and conditions for the payment, and always like putting payments after the delivery of the product, you know, at different branches. So I will probably do the same because I am the same founder, so I cannot probably change much of what I need and how I'm wired, but I will be a bit wider, let's say.

Interviewer:

Okay, okay, great insights, thank you. And now for the last question, which aims a little bit into a future outlook, do you anticipate any changes in product development in your industry? And now especially looking again, do you think more and more people will go with technical co-founders or more and more people go with the no-code, low-code tools or more and more people for contract providers, and why do you see that change, or why do you expect that changes to happen?

Interviewee:

Yeah, so let me frame it because I missed a couple of important words at the very beginning of your statement. You are asking me how I see founders moving in the near future, if they're going for the option one, who are the correct ones.

Interviewer:

Exactly, and especially focus on product development in the beginning of the startup and also focus on your industry.

Interviewee:

Okay, it's difficult to share a trend because every founder has different capabilities, and so if you are able to understand a bit tech as I told you before, probably you can go with no-code, low-code, or what you can try to do is to find, rather than maybe a contractor, a good freelancer, like always a technical expert, you will share what you need exactly and this freelancer will use the probably

low-code, no-code for sake of simplicity and speed. So yeah, maybe that's something I would do different as well, going back to your previous question. I could also consider, you know, maybe to invest a few hundreds of euros with someone that will use these low-code, no-code tools and at least to come up with a very simple mock-up. So probably that's what I would do and probably, yeah, that's something that can be done by general, as a general statement or both, because yeah, there are, like, when we started the development of our app or the technology tools 2018, 2019, so you didn't have access to technologies as we do today, you know. Like now I have some friends, they put together a startup in the logistics sector, and there is the technical founder and the business founder, they are two. And for instance, the technical founder, who seems to be good, is just developing everything himself with the help of chat GPT and other tools online. So once was employing maybe three or four different people, now can be done with just one skilled person.

Interviewer:

Okay, okay, no, that's really nice insight. Thank you, thank you. Do you have anything else to add? Otherwise, we would be done with the questions and have only then three statistical mapping things left.

Interviewee:

No, I am fine. Okay, perfect.

Interviewer:

When you really have this a lot and then just the last three things to wrap it up, just quick fire things, in which year was your startup founded?

Interviewee:

2018.

Interviewer:

Okay, perfect. And what is your educational background? So in what field did you study and what was the highest level of education you achieved?

Interviewee:

Master in Finance and Master in Entrepreneurship.

Interviewer:

Okay, okay, great. And the last one would be what type of product is your core product here? We are comparing a software, hardware, an app, a physical product and so on and so on.

Interviewee:

Well, our product is a software based product. So it's totally technology.

Interviewer:

Okay, but you also have an app or not?

Interviewee:

Yeah, yeah, we do.

Interviewer:

Okay, great, great. Then that would it be for the interview. Thank you a lot for taking the time. It was really interesting and nice new insights. Last question, would you like everything to be anonymized or would it be okay if we keep your name or company name in the transcript?

Interviewee:

As you wish. I don't mind if you want to use my name. So whatever you prefer guys.

Interviewer:

Okay, okay, great. Thank you a lot.

Appendix 6: Interview 9

Interview participant: ID9

Interviewer:

So, let's kick it off just in the beginning quickly with the bureaucratic thing. So the interview is aimed to be maximum 30 minutes, but usually it's always around 20 minutes, 20 to 30. And as already said, I would transcribe it and add it to the appendix in the end. And the last aspect is in the end of the interview you can just quickly tell me if you prefer the data to be anonymized or if you can connect it with your company name or with your name. For us it really does make any difference, just however you feel more comfortable. So to kick off the interview, can you provide in the beginning just a little overview of your startup, what you created and especially with a focus on what is your core product and in which industry you operate. This is really enough super briefly, like maximum one minute.

Interviewee:

Sure, of course. We built the first app-based incubator in UK and that means we are aiming especially at students, researchers and young entrepreneurs. And for them we built an app on which they can find co-founders, okay, they can swipe through profiles of others and match each other. They can get a news feed and they can see any events that are happening and also like any incubation, incubated data and so on. I mean, in the industry that's a bit hard to say for us. I mean generally we're building like a platform so it's like around that. Any other questions on this?

Interviewer:

No, no, really fine. Just to get back into the industry because some industries we often hear now, where for example AI or consumer tech, are using any AI or would you say you could also enter to consumer tech or is it more platform business? Sure, I mean we do use AI, even though AI is not an industry, it's just a tool, a technical tool, but we do use AI, yes. For the matching itself, that's like an ML order rhythm we have and we're also working on like gen AI co-founder that helps you

with setting up things. I mean that's quite straightforward as we know it today with GPTs.

Interviewer:

Okay, actually it's perfectly into the next question. How did you approach the development of your core product and what was also your personal role in that process and development?

Interviewee:

Sure, so when we really kicked off the whole thing, this was all about building an app and also having some algorithm in place, but the algorithm wasn't really like to match people efficiently, but the algorithm wasn't really like the thing we were worried about in the beginning, was more building the app, how did we get the capabilities together. When we kicked off it was just my co-founder and I, he did a PhD in physics also here at Imperial, so he was really leading the tech side and very capable of that and just like learned from scratch in a way how to build an app. Today we have broadened our tech teams and luckily in London there's a really good source of students that are very capable as they're quite good units around here, so we have two students also from Imperial who work for us and two from overseas that we hire through LinkedIn.

Interviewer:

Okay, nice, nice, thank you. And your role in the product development, did you also play an active role or did you leave that more to your co-founder?

Interviewee:

Yes, I'm a bit involved in the product design, so I often provide drafts also on Figma or something like this and discuss with the team and then it gets translated in their way, but this is really between (Name anonymised for confidentiality reasons) and I.

Interviewer:

Okay, and you mentioned that (Name anonymised for confidentiality reasons) is your co-founder, right?

Interviewee:

Yes.

Interviewer:

So you mentioned that you created it together with (Name anonymised for confidentiality reasons) and did you consider any other approaches besides of that and if yes, what was then the one key aspect which made you go for this approach for product development?

Interviewee:

We were at some point in talks with someone who would build the whole app for money and we were in quite progress discussion with him because we were curious about this, but at the end we didn't go for this because we were unsure about quality and also about independence when we go down this route, so that's why we decided to do it ourselves. I think that's one of the big alternatives we had and then we decided to do it ourselves.

Interviewer:

Okay, nice, interesting. Now to open it a little bit more up, you created a startup with a co- founder and you already mentioned that another option you considered would be to do it with external service providers and something else we often hear and read about was also to completely do it individually as a solo founder and then for the technical part you support no code or no code tools and for now for the next questions I would like to see your opinion by comparing these three options. So the next two questions, I will make two rounds of this because it's a little bit complicated, formulated and now aims to specifically understand how successfully your startup was based on the product development approach you took and for that we look at four factors, you don't need to touch on any of them and you can also touch them indirectly, but we would like to understand the success regarding your market capitalization, your time to market, so how long it took for you to develop the product, the capital efficiency and also the revenue and now let me do

a second round, I think that might be good. So the four factors we are looking at are the market capitalization of the company, the time to market, the capital efficiency and the revenue and now I would like to understand what was your one main challenge you realized or your face because of the approach for product development you took. I will also quickly put you the four factors in the chat and really you don't need to touch on all of them and it can also be touched indirectly.

Interviewee:

Sure and you are interested in what we battled most with?

Interviewer:

Exactly, if you look at now your approach, where do you think you had problems you wouldn't have had in other approaches and what was like your main challenge with this?

Interviewee:

I mean I'm not really sure if your metrics is super valid for startups generally, I do see that it makes sense in companies when you have a project to evaluate it with this or for us it was really about time. I mean the quicker we build stuff and can test stuff and so on, the quicker we know stuff and so I think it's for us it's all about time and getting quicker and quicker and this is still something today that we want to improve. I mean talking about the other things revenue or even market capitalization that's from the product development just a bit like the effects of what we build ultimately comes down to time.

Interviewer:

And would you say with your approach you faced a challenge then regarding time or would you say your approach was the fastest one?

Interviewee:

No for sure not because first of all in the beginning we had a very different app learning that looked very different to what we have today and we changed this because we got the feedback and so on

and we built this but it was also a learning process for us how to do it in the right way and so on. And I mean for startups it's often you have like a budget and the longer it takes you the more money you spend just because more time passes right especially when you are working with freelancers together or so as we also do. And so yeah again it comes down to time just the quicker you act and then creating something the quicker you shorten the whole timeline of developing a product.

Interviewer:

Okay thank you and if we turn now around what would you say was the main benefit your approach brought you?

Interviewee:

Flexibility, independence I think these two. We were really in complete control about any changes we wanted to do and so on. So when I don't know we would have gone completely to outsource the building of the app also to someone else. First of all I don't believe that the core product should be done by somebody else it should be somehow done in the team. It's otherwise I don't really know what the startup is doing right what this is about and otherwise and yeah you're just not that independent because you'll probably set up like a contract with the freelancers and so on and you define what gets delivered but I mean early stage in a startup it's quite normal that things change and that quite often and you just don't have the flexibility when you're in a set contract and the other party only cares about the money.

Interviewer:

Yeah makes sense. And now for the last two closing questions we would get a little bit more hypothetical so the next question would be if you would now start your startup again would you choose a different approach for product development and what would you do different and where would you stay with the same decisions?

Interviewee:

Sure I mean that would go a bit deeper in our tech stack so right now we build our app with Flutterflow you can group it later that's a platform quite useful to do it and we're still very much discussing to take it off Flutter flow now because there's quite some limits that would mean we could export the code because we own it and just directly build it in Flutter and that's a bit more scary because you like build the app from scratch literally like building a website with just HTML code and it's a bit more scary but it has clear benefits and we really got to the boundaries of using Flutter flow so I think when we redo it now we would like immediately jump to Flutter and hardcoded ourselves instead of losing some interim solutions like Flutter flow.

Interviewer:

Okay but you would not change any of the approaches if you look back at the three options of going with a co-founder, creating it completely yourself or using an agency with how you went there you would stay the same?

Interviewee:

Definitely yes I'm very happy with my co-founder and we are a really good team and I'm happy yes. Okay nice to hear and the last question would be this is now specifically for your industry but if you have any thoughts about general startup and what also I'm happy to share do you anticipate any changes in product development now also especially looking again at these three options how the people will go for in the next years?

Interviewee:

You mean for us or industry-wide?

Interviewer:

Industry-wide do you think startups in your industry in the next years will follow a different approach looking at going for co-founder individually or with agencies?

Interviewee:

So when I go to startup events in London and I meet those who haven't started yet but have an idea it's mostly that they tell me they're looking for technical co-founder and they ask me if I know someone and I think this will change that in some years and like short years like five years or so we are able of those we're looking for technical co-founders can partly or like many ideas can be replaced by let's even take the AI or so and or you said earlier like low code solutions and so on so I think the currently high need for having a technical co-founder will not be as high anymore and some years from many ideas except you go in any deep tech startups or so then surely you need very skilled technical co-founders nonetheless.

Interviewer:

Okay, great.

Interviewee:

But I mean like building an app in five years that's something I can do that in five years easily while today I do need as I prefer now a technical co-founder or somebody who can like really code the stuff.

Interviewer:

Great, great, thank you. Could you be then from the questions except if you have any comments from your side on that topic in general?

Interviewee:

Yeah, I mean maybe on the interview no, anymore just curious to hear what your idea was about and what the status is now.

Interviewer:

Yeah, sure, then let's just then quickly wrap it up with the statistical needs and I would quickly need to know when your startup was founded in which year?

Interviewee:

2022.

Interviewer:

Okay, perfect. And what is your educational background? So in what field did you study and what is the highest level of education?

Interviewee:

I did a master of business analytics here in London even though my degree is not conferred yet.

Yeah, I technically only have BSC as high education right now.

Interviewer:

Okay, and your product type is B2C app, right? Or is there any other software you're using? Because we're mapping always if the product is a software, a hardware or a mobile app.

Interviewee:

Oh yeah, it's, no we have a mobile, so we have a mobile app but we also have a web app. So software, yeah.

Interviewer:

Okay, and now it's just up to you if you want the data to be anonymized or not. But you also don't need to decide now if you want.

Interviewee:

Sure, I mean I don't have a problem with that, that's all good.

Interviewer:

Okay, perfect. Then that would it be for the interview.

Appendix 7: Interview 10

Interview participant: ID10

Interviewer:

So just in the beginning to quickly get the bureaucratic stuff done, the interview is planned for 30 minutes and usually we're always done in between 20 to 30, so we should stick to the time frame. And as I recorded, would it also be okay if I transcribed the interview in the end and put it into the appendix of my master thesis?

Interviewee:

Yes, no problem. That's acceptable.

Interviewer:

Okay, perfect. Then let's kick it off. In the first step, can you provide a short overview of your startup and its core product and also the industry you're operating in? Here's really enough if you have like a one-minute overview.

Interviewee:

My name is (anonymized due to confidentiality reasons), the founder and CEO of (anonymized due to confidentiality reasons). (anonymized due to confidentiality reasons) was founded as a platform to promote innovations that accelerate the access to clean energy and productive use of clean energy applications in low-income communities in Africa. And this was informed by my 15 years experience in the industry and I developed this platform to accelerate innovations. My flagship innovation is (anonymized due to confidentiality reasons), system to create access for safe drinking water to rural and off-grid communities in (anonymized due to confidentiality reasons).

Interviewer:

Yeah, thank you, thank you. So just to wrap it up, what would you consider as the industry you're operating in?

Interviewee:

So a clean tech company. Okay, perfect.

Interviewer:

And how did you approach the development of your core product as a company and what was also your personal role in that development?

Interviewee:

Yeah, our core product we developed based on the actual need and assessment of the gaps that exist in the off-grid solar sector and access to electricity and the resulted applications of off-grid solutions in solar. And so I was personally very much involved with the leader of the development board of the innovation and the business based on my 10 years experience in the off-grid solar industry.

Interviewer:

Okay, and just to follow up on this, what type of development was needed for your products? So was it physical engineering or was it software engineering or like what type of development did you need to get to your product?

Interviewee:

It was more physical and design engineering to physically design the product and testing the applications and the software components were just picked from the existing off-the-shelf solutions for pay as you go models.

Interviewer:

Okay, and your personal role in the development was also to actively design and to actively shape the physical engineering part, correct?

Interviewee:

Yes, yes.

Interviewer:

Okay, and did you use any help for that in terms of like low-code, no-code tools or something similar?

Interviewee:

Yes, most of the resources and the tools we used are local and detail about tools and also including the human resource we used local engineers and in terms from local universities in (anonymized due to confidentiality reasons).

Interviewer:

Okay, thank you, thank you, and did you consider any other approaches to product development, for example getting a co-founder with the expertise on board or also to outsource development, for example?

Interviewee:

Yes, actually that is the next stage of development that we are working on currently and just a couple of, I have been engaging a couple of stakeholders especially in the US to get a co-development team that I can incorporate into my business, especially on enhancing the robustness of the technology and also tapping into advanced innovations in both solar and water filtration systems from the US, so that's something that I'm making up.

Interviewer:

Okay, okay, great, great, because other possible options to develop the product which often were mentioned in other interviews or also in literature is to get like the co-founder with the special product knowledge on board, especially the technical knowledge, or like as you did it by yourself or lastly also if you get like freelancers and external service providers on board, and the next questions would aim to always compare these three different alternatives and options. So the next question is formulated a little bit complicated, but don't worry, I just make two rounds for the question, because the goal is to now specifically understand what was the one main challenge you

approached to develop the product alone and brought you in comparison to the other two options of going with a co-founder or outsourcing it, and for that I specifically want to understand how did this challenge you in terms of achieving market capitalization, time to market, capital efficiency or revenue. So I can quickly put you the factors into the chat and then you can also double check and the goal would be to understand what was the one main challenge you approached to develop the product alone, brought you in comparison to the other two alternatives you just talked about.

Interviewee:

Yeah, the main challenge to doing the product alone of course was time and resource constraints, because if you didn't alone then you don't have access to so many resources, both especially on the technical side and myself, I'm not also a super technical person when it comes to like a water filtration system, yet my innovation involves the combination of clean energy in the water filtration system and so that was a biggest a bigger challenge that has slowed down the development of the product and deployment of the prototypes currently we are just doing at 5 minutes, but then compared to the other factors, the other options of say getting a co-founder with the technical knowledge, it's something that I consider but then also consider the downside of it which is then having to get getting someone with that kind of shared vision of social impact and social entrepreneurship and getting to at the right fit both in terms of whether you're talking of just a co-founder or like as you're saying market capitalization getting investors out of people to puppy that has also been a challenge and so it's not it's not it's not really like something that I'll say it's an off the shelf that I can just go and pick a co-founder on the shelf and say okay I think let me use this co-founder or let me use this partner let me use this investor it's not that we can go kind of scenario so yeah that's that's how I see it

Interviewer:

great great so and we talked a lot about challenge of a co-founder but could you just quickly

summarize again what would you consider as the main challenge you had of doing it alone because I didn't 100% get that

Interviewee:

yeah yeah the main challenge I had was a constraint in terms of resource like I didn't have enough resources when I'm doing it alone and these resources both the financial resources but also the technical resources access to knowledge and as I mentioned like I'm doing water filtration system which I'm not an expert in and so the main challenge was getting the right information the right knowledge that I tried technical specifications about water filtration system to incorporate into my clean energy solution because my solution is both a clean energy and a water filtration system yeah go ahead thank you and if we turn the question now around what would you say was the main benefit your approach of doing it alone um brought you in product development regarding these factors yeah the main the main benefit is quite obvious that uh doing it alone I have full control I have the leverage to make mistakes and correct them I I get to decide and pursue the the product and the business in the life that I I mentioned because I have a vision and a vision that led me to start this business and so when I'm passing it alone I don't I can remain that course I can remain on that line on that mission that's what I want to achieve without any distractions because when you when you get a profounder an investor or whatever on board then you also then have to align your mission your values and what you want to do with what they also want to do at least make them align and for now I don't have that challenge

Interviewer:

yeah understood and now we already reached the last two questions of the interview these would now end to be a little bit more hypothetical so um the first one of these two would be or is um if you would now start your startup again would you choose a different approach to product development so this question aims to um if you start again um would you do everything alone again

or would you go with a co-founder or would you go with the external service providers and freelancers for example in some points and if yes why would you do that changes

Interviewee:

if I was to start alone I will probably still go it alone but with a few lessons learned but having looked at the other options and the leverage that I have enjoyed by going alone I'll still go it alone and I think that's also a great it is into my own personality I'm a very my person who likes to be very independent so I like making my own decisions and so on so I think if I was to start alone I'll still try to be the same person that I am yeah got it and oh yeah yeah yeah go ahead yeah so yeah so for me I've taken a few lessons years but I still want to go it alone and work a bit more harder but then pursue my mission and vision a lot okay so you would also not in smaller steps of the product development would bring an external person like a co-founder into your company or bring the development to an external service provider correct you would like to from the beginning to the end would be in full control of the process

Interviewer:

yes yes okay got it and the last question would be in your industry of clean tech and you anticipate any changes in product development in the next years here and the questions especially aimed at understanding of do you think more and more founders will for example go with a co-founder with a technical one or more and more founders will go for external service providers or more and more founders will do it alone and this is what the question aims should also to understand why you think these changes will happen yeah I think just like most industries the tech industry is so dynamic there are so many things that are happening they clean in the clean tech industry and like currently I'm very keen on battery technologies that are actually increasing the lifespan of the batteries increasing the the speed of charging increasing the capacity in terms of what how much the batteries are able to hold for for what period and so based on that I'm I'll be keen probably going forward to

engage either a service provider or a partner or even a co-founder who has such a kind of knowledge technical expertise and and and and and and this drive also shares the mission and the drive to be innovative and and and and and entrepreneurial to pursue opportunities in that space that's something that and I'm just not saying it it's something that I'm already I've already started working on like as my next innovation or product innovation to look at what are the innovative ways we can develop manufacture and produce better quality batteries especially like lithium is not going anywhere any type soon so can we enhance lithium batteries to make them more effective more efficient more longer lasting and and and have higher power density so that then we can because my aim is to to explore the opportunities that are emerging in immobility especially in low income you know countries in developing countries in the developing world where we also just like the rest of the world deserves to be part of the energy transition in the clean energy transition but then the cost of of of immobility application is is is prohibitive based on the battery technologies and the cost of the batteries that are already existing so that is something that I'm keen on that is an area that then looking at the data is about how the industry is evolving I'll be keen to attract and talk to partners and engage people who can with whom we can together innovate around aspects okay okay got it and going a little bit away from your startup and looking more into the clean tech industry in general and do you see any changes there in product development because the last question really aims to try to understand what do you think how will the clean tech industry look in the next years will the people go with the co-founder do it alone or use external help to develop their core products and why do you think this will be like that in the industry I think going forward probably there'll be a lot of collaborations which means people will go with co-founders and this is to integrate different types of technical knowledge and capacities together because the clean tech industry as I've mentioned it's it's broad there are several aspects that are coming together to then make better innovations better products and more responsive you know technologies and by

responsive I mean technologies that that address practical and specific needs of the communities or communities or institutions or companies that we're addressing or even households and so I think it will be collaborating it will be more co-founders people working together with other co-founders with different knowledge and expertise and and also in terms of resource mobilization sometimes even just a co-founder who has the capacity then to pull the right strings so that then because some of the technologies that we are talking about in the clean tech space are very expensive to deploy even just as as a start-ups and so there's need to have that broader perspective and as I mentioned earlier even myself are also looking at that going forward in my next innovations okay good thank you

Interviewer:

thank you so um we would be done now with the questions now we're just free I mean quick fire mapping questions so this is just something you can I guess answer very fast the first one would be in which year was your startup founded

Interviewee:

2022

Interviewer:

yeah okay and what is your educational background so here I'm looking at and in what field did you study and what is the highest level of education you obtained

Interviewee:

yeah my I studied virtual of commerce then master in project management and clean energy technologies yeah

Interviewer:

okay so um you would you consider your background a business background or an energy background okay okay and what type of product is your core product and we already quickly talked

about it but here we try to understand the difference between a software, a hardware, an app, a physical product and so on

Interviewee:

the mine is a hardware yeah got it then we would be done thank you a lot for taking the time the last question would be do you want the data to be anonymized or can it also be connected to your personal name or your company's name yeah I would love to be it to be connected to my personal name and uh and I would love to be open because I also one of my things that I always do in my other life is to share information, share knowledge and so I don't want it to be anonymous I want it to be known that this information come from me.

Appendix 8: Interview Nicolai Mokros

Interview participant: Nicolai Mokros

Interviewer:

Okay, so just then quickly the bureaucraties and I said we would record it and if it's okay we would also transcribe it to put the transcript into the appendix of the thesis if it's okay for you.

Nicolai:

Okay, okay, perfect.

Interviewer:

And okay, we can also see that after the interview of course, of course, yeah, sure. And that time horizon is 20 minutes and we also try our best to stick to that.

Nicolai:

I have no problem with recording and transcribing for yourself. The question is if you want to put it as an appendix to your thesis, that's the point, okay?

Interviewer:

Yeah, we can, when in the best case, let us quickly check that after the interview when you also know what the questions were.

Nicolai:

That might be easier then. Okay, let's go ahead. Keep it short.

Interviewer:

Yeah, sure. Firstly, can you provide us a short introduction of your background? So what did you do? And also how are you connected to co-founder matching or co-founders and general product development?

Nicolai:

Okay, these are two different answers. The first product development, I've got a background in product management, so I started physics, did my own startup and from then on, I've been involved very much in product and product management. Also, it was kind of training product management,

so that's one side, the other side, co-founder matching. So first of all, during my time at COPROTS, I got a lot of training, leadership trainings, so I'm not aware of why team is important. That's one thing. And then when you look at our teams, we are having, so we are a collaboration of University of ULM, Technical University of ULM, University of Biberach and University of Applied Sciences of Neu-ULM. So we are covering kind of 20,000 people there, there are several teams, currently we count 140 teams and who try to build their startup, they have not funded their startup yet, so we are in a very, very early phase and we see people coming there with an idea and missing talent. So we see people from management studies who want to do an app but are missing the technical people and vice versa, you're seeing technical solutions and people missing the management and the sales part, in particular the sales part. So I think you need to have different qualities in a startup, means you need to understand your market, you need to understand your technology and you need to understand your financials and go to market and these are very different skills, so we are looking if these skills are present in the team and it's very certain that you find it with one person only, in particular the one way to fund the early stage teams which are not funded companies, but they are forming, they exist ground that we get from the Federal Ministry of Economics and this is our university's way to give money to a group of people for doing the business plans and business cases and usually there are up to three people in the smaller ground, up to four people in the larger ground financed and when people come with an idea or they need people who are applying for the ground to show that they have the skills in their team, that the jury trusts them that they can reach it and then for that they receive the ground, so in doing that it's important sometimes that we complete the teams with the necessary skills for that they have a better chance to get the money.

Interviewer:

Ok so to quickly summarize the part of your experience in co-founder matching, your role is to provide students from your university network the support in finding a co-founder if they already

have an idea correct?

Nicolai:

No we are doing a joint effort of four universities to have much more startups funded from university than before, preferred with tech ideas from research and for that they get the access correct and to have complete teams and that was in particular in my own work we have established a service where people can find others as co-founders, this is kind of a service I'm not a co-founder matching professional.

Interviewer:

Yeah no got it got it ok and then to the next question for that we would now especially because you touched on both sides that technical people can find a non-technical co-founder for the support in sales and finance and the other way around but non-technical co-founder can find someone from a technical side to help them creating an app or something similar and for the rest of the interview we would focus on this side so we would focus on the side of non-technical people looking for a technical person supporting them to create their startup and for that the first question would be would you say to create a startup as a non-technical founder together with a technical co-founder you need also yourself and a little tech background or would you say that's completely possible if you go into that project with zero tech knowledge and give it completely to the technical co-founder?

Nicolai:

If it's a co-founder that can work yeah why not. I can't give you qualified numbers for that yeah but for my gut feeling I would say that you need to respect what the other one is doing then you can get it done without the experience and you need to listen then you learn it over time. You will be able to program yourself or coach yourself but you will understand what the problems are and the requirements are. I learned it myself.

Interviewer:

The question comes from that background where in our interviews with the founders we sometimes hear that the non-technical founders regretted trusting their co-founder too much in some points or then had the feeling that they can't really see what the co-founder is doing or how far the product is developing and how good the product really is so from that background the question comes if you would see that as a general risk or if you would judge that rarely rather as single cases.

Nicolai:

The point is you need to, it's a risk if you're not aware of it and if you're not handling that okay so that's in particular what I am doing is I always tell the people that they need to have respect and trust each other for how they are doing it and talk about it and you get it done. If you're not talking and you are because you trust it, if you mean to trust each other not talking about what's happening and what might be risks and you're not managing these risks, then yes that's a mere...

Interviewer:

Yeah so you would say to overcome this challenge the two keys are trust and frequent communication.

Nicolai:

Absolutely.

Interviewer:

Okay great.

Nicolai:

Good planning, good planning, so have a good scrum, get your planning, do your retrospective, do your, by the way the other way around also, so when you do a software product you want to have test customers and you want to have customers that are representative for a bigger group of customers. You don't want to have the, you know usually you get these innovative customers and

early adopters and those guys are keynote technology but perhaps this is not your market. So most of the technical guidance to trust and is perhaps not aware of that problem but it's a trust, a sales guy or a management guy to get the right customers there for testing the product that you are then later, not that these test customers are from your target group and somebody needs to do a business camera, somebody needs to think about the business model, so also the trust from the technical side on the other part is as important and both is, and both need to understand what the other one needs so it's only about communication, being clear, having a process and as I say having a scrum because this is really new planning, having stories, having aligned goals, having constant exchange about who is your target customer, which is important for the technology abroad as well as for your business model and then iterate that. And the co-founder means that you're doing that together, if it's not a co-founder, if it's an employee, you're paying, okay you're deciding everything yourself and you are having all the risk on your own side, but if you have a co-founder you're sharing risks so you can talk to him.

Interviewer:

Yeah, no, makes no sense, thank you. And now for the last part of the interview, we would aim to understand and compare the variant to create a technical startup together with a technical co-founder with the two other options we are also touching on in our work and these two other options would be first, but the non-technical founder creates the product completely themselves by using no-code tools or no-code solutions for example and the other option would be to get external help through outsourcing, so to get an agency or a freelancer to work on the product. And our goal would now be to understand what are advantages, disadvantages of the co-founder and comparison to these other two and for that we now want to first start with the challenges. So what are challenges A technical co-founder can bring you which the other two options might not bring or not in that specific level? And if you want, we have some guidelines and borders where you can think in, you

don't need to stick clearly to them but just to have something in the back of your head. What we're usually considering are challenges regarding market capitalization, time to market, capital efficiency and revenue. So what are challenges which kind of touch on these areas? If you want, I can also quickly put them into the chat but you don't need to stick 100% to them, it's more a guideline to have some ideas.

Nicolai:

Let's say it's an interesting way to ask the question. The point is, it's very simple, there is something called a value chain. So you are adding value, you're doing added value to something. So you're buying something, you add value and you sell it and then hopefully you have a product, people are giving you some money for it. So if you have a low-coding platform and everybody can do the same as you do, there is not really IP protection perhaps. So sometimes you're not even getting, having patents but you need to just be quick to get it out. So for being quick is a good thing but if everybody can do it, you know, with the technology, you need to be always quick and in advance. And it must be sustainable. So even if you work with a low-coding platform and then you want to scale big, be sure that this technology stack can bear it for a long time. So perhaps it's not sustainable enough. So I've never thought about, is it better to have a co-founder, is it better to have a low-coding platform, better to outsource it?

Interviewer:

It's also maybe just to quickly jump in. It doesn't need to be a clear comparison to say co-founder is the best or outsourcing is the best. It's rather to understand from our side a little bit. From the founder's perspective, imagining you would be a non-technical founder, you have these three options and you try to look at all of them and now you look specifically at the co-founder and you ask yourself, okay, what are the challenges and risks I have when I go with the co-founder? Yes, it doesn't even need to be limited to university. So if you want to create a tech startup as a non-

technical founder, so let's say a business student, a business graduate.

Nicolai:

I would never go with an outside tech team that is then coming on, is going away, it has no skill in the game. So because then, you know, you miss the education and every way you have a problem, you're running behind, you don't know what priorities they have. So you perhaps, after they program something, you perhaps not even trust priority anymore. So if you have a product where you can do a one-off, okay, why not? But then you need to add something else. So perhaps if your product is not, yeah, you said it's a technical product, okay, that already sets the point. If it's not technical enough and you're doing something new because of your, whatever you have as innovation, for example, in business, that's okay, yeah. But if the technical part is your value chain, you should make sure that you have that and you have that sustainable in your answer. Means there is always somebody who's trying to break into your networks and so on. So you will not, you need to keep your stuff up to date, yeah. So working with the freelance agencies is always things like one of them. And my experience with agencies is that they are, I mean, I've seen out from, out sourced teams offshore, which has absolutely been crap actually, yeah. So you can be lucky or not. I mean, and you need to know so much to choose the right supplier. No, but these I would, I would rather than, because these I would now already rather put a little bit into the box advantages of the co-founder, where you really have that internal knowledge. But I'm going back to, do you see any challenges or risks for specifically now going with a co-founder? The point is, do you have the money or not? If you don't have the money, you need to have a co-founder and you do boot shopping together. Yeah. If you have money, you can spend money. But if you don't have money and you need to raise money, you need to first find people who trust you. And second, you're giving away your shares a big time, yeah, perhaps, yeah. So if you're, if you're not putting in, if you don't have the people in who are creating the value, but you create that from outside and buy that, it will

be tough to raise money. And then when you, when you have a co-founder and you later get into the situation that you want to scale and then you need money, then people won't trust you that you have the technology controlled. I mean, it's a very individual question. It really depends in the startup you're doing. So in general, if you, if you start a tech startup, you should own your technology and you should be able to master it with the people that are in there. It could be the co-founder, perhaps the co-founder of the team, but that's the key to get investments if you want to pay later. And let's say a startup is a company that you're funding with an innovative technology idea that wants to scale later. You need to have that in-house, okay? I mean, you can leverage your knowledge by having them, in addition, external people delivering something to you. Yeah, but you should not do that completely outside. And if you go with low-coding platforms, go for it, but check that, you know, that you're not paying, you're not paying off all your, I mean, that's a calculation. If the price for your low-coding platform is too high, compared to the price that you can get on the market and the added value you have, then you would have another problem to become profitable, which is also a problem for investors. It really depends on what you want to do. If you want to be a startup that scales later, you've got a point. If you want to have your own company and scale linearly, grow slowly, no problem. You cannot do all this stuff and keep it under control. We are separating startup from people being self-employed, okay? So if you want to have a company and you just do a service and you're, for example, a media agency and you're only scaling with your own work time that you put in, that's all fair, but we don't call that a startup, yeah? If you say, okay, this is a technical startup and you want to scale, then we use the term startup. I'm not sure if this is the same term for you. Yeah, we are also only considering what you just mentioned as the term startup. Yeah. Then I would say, okay, low-coding is good for checking and trying stuff, yeah? But then you might want to have the cost out later, yeah? Or as soon as possible, but you can do quick prototyping. There's nothing wrong with it. In building products,

you should understand your product and you can offshore stuff, but you should always be able to take it back, yeah? Yeah. Understand what you're doing, yeah? Yeah. No, because some points we get from the founders is potential challenges, where, for example, when having a second person on board can also sometimes slow down the process as you're not only developing the product, but also need to have internal arguments, which on the other side can also make decisions better, but you sometimes have internal arguments for that, especially for app products, one person, one co-founder cannot be enough to develop an app because you need the iOS interface, the Android interface, you need different interface with potential front-end, back-end, so it's hard to find one co-founder who can unite all of this. Do you have any thoughts on this? Yeah, yeah, that's what I said. So you should at least understand what you're doing, technically, then you can also stuff, okay? No problem with that, but as a pure, let's say, you're a manager, yeah? You want to fund a startup and have no technical background and want to have a technical startup done, and then you buy from externals, the code and whatever, you will have a problem to have these externals kind of paid, controlled, and long-term available for you, yeah? Yeah. So that's a problem, yeah? And you know somebody needs to understand the code. If you have somebody who's technically understands the code, then you can partially put it outside, no problem with that, yeah? But you always have somebody who understands when it's time to put it back or to find another supply area. So you need to create a steady knowledge inside the company. If you don't have that, nobody will invest in you.

Interviewer:

Yeah, no, it makes sense. And now I'm wrapping it up and to turn it quickly around, we talked now about challenges with going with a co-founder now to understand a little bit what are the key benefits. I already got from you what you mentioned that fundraising is a good point that you can present yourself as a team stronger and also what it gives you a competitive advantage if you have

the knowledge inside and not only got the code from outside. Is it correct that I understood this point already from you or would you say what I misunderstood, yeah?

Nicolai:

Yeah, I think roughly that's how you can say it, yeah? So actually, the guys are looking for different skills, the theories when they give you grants, yeah?

Interviewer:

Okay, great. And that would lead us to the last question, which would just be a short future outlook. Do you anticipate changes regarding choosing a technical co-founder for product development? Especially now for what we talked about for non-tech founders creating a tech startup in the future. So maybe to give you a quick idea where this comes from, do you think in the next years, in the next short to medium future time horizon, more non-technical people will go with a technical co-founder or less non-technical people will choose the technical co-founders and their way to create their startup? Do you anticipate that there will be any changes or if yes, why do you think that might happen? I have really, let's say, I'm missing kind of data for that, so that would be a pure guess. It's really okay. So it doesn't need to be accurate data and forecast. Just what is your gut feeling? What are your ideas on this?

Nicolai:

I'm even missing points to make an educated guess.

Interviewer:

I mean, if you want, we can give you some feedback once again, what we got from the founders and when you can comment on this.

Nicolai:

Yeah, I can comment. Let's see, let's try that.

Interviewer:

Because from some founders, we feel that the technical co-founder becomes less and less relevant in the future, just because no code tools and AI and cloud services become more and more powerful and therefore also more usable by non-technical people. So it becomes possible to build an MVP, get first revenue and raise money with other technical co-founders more and more easily. That was one perspective we heard. However, from some other founders, we also hear the perspective that it might be beneficial to put the no code tools always under the head of a technical founder. So do you have thoughts on these two perspectives?

Nicolai:

I mean, even for using no code tools, you need to have a technical understanding. So you need to know what you're doing. I mean, perhaps I'm too old actually. I mean, I did my startup some 35 years ago and I went through different corporates. This is, let's say, the old world of understanding what your value chain is and owning your value chain. And I just think if you can quickly put stuff together with what's available, then your own added value is not much. And if your own added value is not much, then you might not earn much money with it. Could be, I'm not sure. For me, it's still tough to imagine that AI and no coding tools together with them, you can create a new product and then roll that out on the market. So you see the value of a startup really coming from the value add in product development, which a technical co-founder can add to the product. And you don't really see where you're coming from. A non-technical person creating a tool which doesn't really add value in the product development but adding more value from, for example, a customer research site. But the non-technical founder, founder gap in the market and then can easily create a product which solves this gap. You don't really see that side growing. You think it will stay with the main value creation of a startup is really the internal or the main value creation of a technical startup will stay the internal technical capacity of the startup. If you have enough money, you can get created the value chain without giving shares to the people who are doing that. It's

okay, yeah? Do it, yeah? But at the end, you need to have that kind of, you know, it's really depending. Do you have money or not? If you have money, you can buy it. If you don't have money, you need to find a way. So having a co-founder is a way to boot from things, yeah? And you always need to be able to show that you are, that the people who are with you are able to do the product. So if whenever you are employed somebody and you're going out to investors and ask for money, then ask you, okay, how do you make sure that this guy is not leaving you, yeah? Because you've got all the risk, yeah? So. Yeah, I mean, there might be lucky, lucky single shots, okay, no doubt. I'm not sure if this makes a trend up then, okay? There always might be people who are successful in the single shot doing that. I've got a friend who's a great salesman and he's got a company and he doesn't have the technical experience himself, but he's selling computer software, so yes, that's possible, but I guess this is not often found, yeah? So we are kind of, we need to separate, and that is the point. I can't tell you what are single point data, or single data points, and what is a real cluster of stuff. And then when it comes to a cluster, I think the fundamental of it is video chain, yeah? And if you're not creating value and you're not making sure that you have that long time, you can create value quickly and then it's a one-off, okay? But perhaps you're not earning enough money for the rest of your life, yeah? So if you want to do something that's sustainable, I think you need to own a value chain. However, you do it and the rest is making your own. So if a local platform is making things easier and quicker and the license cost you're paying for it is less than the effort you need to put in and go for it, yeah? No doubt. So we might be on a situation where local platforms are getting cheaper than the people who are doing the full coding stuff, yeah? And where they are as handy as you don't need the technical person anymore, yeah? But is that already available? I'm not sure.

Interviewer:

Yeah, no, I think really nice closing words because it was a little bit what we tried to understand

because it's of course something you can't comment on when we would be trying to understand this. If you, from the perspective who's more involved in startups going with a co-founder, would see the switch going to no-code, low-code platforms if it becomes technically available or if you would say no, the factors like the social aspect you touched on and the fundraising aspect you touched on will still stay there.

Nicolai:

So even if the product development is technically possible and you would... It's a calculation, yeah. You need to calculate through it and if the technology is making that easier. But I'm not sure, you know, because then that means if you can buy it, somebody else is delivering the value, yeah? And earning the money with it, yeah? No, sure.

Interviewer:

Thank you a lot.

Nicolai:

So what's your part of the game? What's your part of the cake that you want to own? And the smaller your part of the cake is, the less you can sell off that, yeah? Or keep for yourself, yeah? I'm just thinking through it, yeah. Good questions. But from my perspective, you know, what we're doing as a hub is we're bringing people together from technology and management and research, yeah? To build teams that are able to do the work, yeah? So, I mean, there are three aspects. One is workforce, having enough time. The second is skillset, be really professional in what you do. And the third is the impossible bootstrapping, yeah? That's the elements why people are still looking for co-founders, yeah?

Interviewer:

No, it totally makes sense, because I think what came from founders who went with no code about the part of the cake you mentioned comes from, or maybe let's first quickly wrap up the interview,

because we're already a little bit over time. And then to quickly confirm, would it now be okay if we transcribe the interview and put it into the appendix?

Nicolai:

Yeah, okay.

Interviewer:

And how do you prefer it, should we anonymize everything which could be connected to either your name or also the name of the hub, or can we leave your name and the name of the hub also inside the transcript?

Nicolai:

Yeah, don't put too much on the name, because then perhaps I should let it read for somebody else. If you put my name in, I'm okay, yeah. And you can write that my function is.

Interviewer:

Okay, so we can use your name, but not the name of startup suite, correct? You can say because I'm also currently head of startup suite hub, yeah?

Nicolai:

And this is the liquid address point, but actually you cannot say startup suite has said that. Okay, okay. No. Because then I would go back to go back and ask the other people from startup suite, do you think that what I said in the interview is right? And I think you don't want to enter this time.

Interviewer:

Yeah, no, no, sure, got it, thank you, thank you. Thank you.

Appendix 9: Interview Andreas Stryz

Interview participant: Andreas Stryz, CTO & Co-Founder Finn

Interviewer:

So, just to give you some information before we start it off, it shouldn't take longer than 20 to 30 minutes, so this is the time we plan. And if it would be okay for you, we would also transcribe the recording in the end and put it into the appendix of our thesis.

Andreas:

Yep, that's fine.

Interviewer:

Okay, okay, perfect. And in terms of topic, you're already a little bit in the loop, but we're going to talk about it, right?

Andreas:

Yes, but if you can give me like an executive summary, it would be great.

Interviewer:

Yes, I will give you only one of the first half of the interview because I don't want to spoil at the second half then, but basically, we're analyzing best practices, especially for non-tech founders, to create a tech startup. And one of the best practices we already realized in our founder interviews was no-code-/low-code solutions. And as you are an expert on this field, it would be really interesting to get first your personal insights and then also perspective from you how you think this could be transferred to non-tech founders. But I think it will be clear in the process of the interview.

Andreas:

Yeah, sure. Yeah, thank you for having me. So just to make it clear, I'm a tech founder, right, so I studied computer science and physics and I'm one of the five co-founders at Finn, so I'm the only tech founder in the group of non-tech people, which just gives me, hopefully, a good view on that. And I think here at Finn, especially, we are currently 400 employees, 350 in the US. And so to answer the topic, and this is maybe a bit weird, but I consider Finn to be the spear front of this

whole low-code and low-code movement because we also set up, I would say, and make a great example here. So that's why for me, no-code, very important, and low-code are completely different topics. That's very essential. That is not yet clear to the industry. No-code is made for and exclusively, for my own understanding, the main target is business people, non-engineers. So people that never work with tech, low-code, on the other hand, is made as a tool, so you need at least some basic coding skills, or maybe basic product skills, to develop very often internal tools so you can make your workforce more efficient. And it's very important to understand that this low-code is very, very important for and the audience is also non-tech people, but mostly tech people. I'll compare for you. Currently, we see in the industry a huge mix-up, and that's why a lot of low-code approaches and low-code approaches fail on the corporate level, but are very, very successful for startups. Long story short, one sentence, it's a low-code is a great opportunity to bootstrap your business and to prove the MVP, to get you up to seed stage, pre-seed for sure and seed for sure. So, yes, that's the answer.

Interviewer:

Great, you already answered the first question before I could even ask it. So, the first question would have been, can you provide a short introduction for your background just for the transcription? And I think only one small aspect we might be missing here, can you give us a little bit insights to which industry you would consider Finn?

Andreas:

Yeah, so Finn is a cae subscription provider, we are worldwide one of the biggest, or we are the biggest with 25,000 CAS on the street. So, you would see us in the interaction, in the section of automotive, but we are not the car manufacturer like Schultz or Tesla. We are also e-commerce because the product is as convenient as possible, and of course in the area of tech as well. So, but I wouldn't compare Finn to an elastic software service tech startup. So just to put it into perspective,

our share of engineers and product people are around 20%, so 80, 80 out of 400 are product and tech people are not, let's say for, if you compare it with GitHub, which is a developer tool provider, right? I think now part of Microsoft, they have an engineering share of 35%. So let's say it's tech, e-commerce, automotive, something, whatever.

Interviewer:

And as you have a B2B and B2C front, would you say you could consider yourself partly as consumer tech and also partly as a B2B software?

Andreas:

So we started exclusively as consumer tech, so 100% of our initial first subscriptions were B2C. Now, I think last year, June, July, we crossed, we made more subscriptions with B2B customers, more than 50%. So now we are, I would call B2B based on the numbers.

Interviewer:

OK, great. And now to the really interesting part, what is your current experience with the no-code and no-code tools? Feel free to differ if you say it makes sense or also to answer, accumulate it for both of them for the product development, especially now in film. So what was your experience? What steps did you take and how did you feel about that steps?

Andreas:

OK, so we have multiple dimensions of this question, right? So I think we have to take into account when we founded film, October 2019, it was just seven of us, right? So we see October 2019 now, let's say October 2023, it's four years, and we grew from 8 to 400 employees. So massive growth is a substantial part of that. So and this is only possible if you really invest into no-code early and make it part of your DNA. So let's answer this question from a mental perspective or from a people perspective. This automate, so from a no-code perspective, we use make.com, so make, but back in the days in 2019, we started with Webflow for our website, then Google spreadsheet to store the

data and Zapier to connect. That's a very fast, brutal, fast MVP built by an intern done, right? So no-code was and is still part of our DNA. So no doubt about that. So in every company that is founded on the foundation of no-code would have efficiency in their DNA baked in. And this is the main advantage from a people perspective that you can see that would bring no-code in to make it a success, because later in time, when you get more mature, of course, you can hire engineers. But let me give you a clear example. When I joined the very early days as a CTO, the first six, seven months, I just spent with recruitment of engineers, because it takes so long. That's the people part. Now, from a process perspective, no-code would give you one unique, unfair advantage. You can, especially in early business models, where you have literally no fucking clue how to build that. And this is reality. You can try out fast and adapt. You stay elastic. That's the essential, that's the core foundation why no-code is so great for the early days. You have to stay elastic. And often in, let's take Finness, an example, you are the smaller partners, partner when you integrate with. So in our case, we integrate with banks, with big car manufacturers like Tesla, Volkswagen, you name it, right? Or Open, or insurance companies, they want to adjust their process to your need. You have to adjust your process. And that's why no-code is so essential. So that's, let's say, the foundation part. So the process part is exactly where no-code will pay out in the early days. Here, once you understand what you built in, you understand the process, you bake that into a hard-code. We call it hard-code code, you name it, I don't care actually. You bake that into code. But the essential part of that is, and now we're coming to the last part of your question was, how is this working with product together? The main challenge of product and pack, so we call pack is equal engineering plus product. Engineering is just, I split this into three pieces. Why, what, and how. Why we are doing things is something that we have to answer from a business perspective. Why we are doing it. To increase customer acquisition costs, to increase our NPU, to whatever it is. Second is, what is to do. And this is, once you understand why, you have to translate this into the

what. And this is exactly what a product management is for, to understand what it's really to do. Should we run this seven experiments? Should we reduce this customer acquisition cost by adding another marketing channel? Should we run just a simple kick-off campaign and that done, customer acquisition costs lowered? Or should we introduce a simpler checkout? Once these two, let's say, topics are understood, the how kicks in. And that's the engineering part, that's the engineering part, to be honest. And this is what most companies are struggling with, right? Because they never answer the why, the what. Once you answer that, the how, that's a tell the engineer what you would love to achieve and they will do it. That's the job. So the beauty of No-code is, you have one person to cover all three. Done. And you have this translation of, hey, why are we doing No-code? You have everything in one brain and this person is equipped to implement this, including the how, and you have fast results. So you can elaborate and iterate much, much faster without translating this from why, what, how, and then it takes ages, one brain and then you execute. Yeah, really, really interesting.

Interviewer:

Thank you. And you touched now on a lot of positive aspects of No-code, but what did you also consider other approaches when you started, Finn? And if yes, what other approaches, except of going to develop the product by No-code / Low-code, did you consider and what was then the one key aspect which made you go for the No-code-low-code solution?

Andreas:

So just to put this into perspective, so after four years, we operate now with Finn in roughly 20 million No-code operations a day. In comparison, we have roughly 5 million pro-code executions a day. What is the advantage here? So we have this number. I think if you follow my LinkedIn profile, you will see this number side. We are super transparent on that.

Interviewer:

Have you considered other approaches?

Andreas:

No. I have to stay fast. It was like, no, because, but I often get this question from a season 8 in all the traditional classic companies. I think it's, I'm going to say that without insulting someone, I think it's ego. I think it's ego of the respected IT departments and respected CTOs and tech founders that's stopping the No-code and Low-code approach. They're afraid, which is, they should be afraid, that their jobs can be replaced. They won't be replaced. It's like this fear of AI taking over all our jobs. Of course, this will impact some areas, but not, but it's not blue collar workers. No. And I think that's the reason why I would say No-code, it's just ego. There's no rational emotions. No, I think it's pretty clear. What is the disadvantage, sorry, I forgot to answer that, you, a lot of your uncertainty and currently we're in this phase of trying to find fake arguments why it's not good. That's it. We will go through this phase and then always, but then it's another tool in your tool set. I think similar to AI, what's the reason not to use AI, you can bring up one million reasons including privacy or you just do it, figure it out, tie out the limitation, same for No-code or similar approaches.

Interviewer:

Great. Great. Thank you. I think it gets pretty clear which advantages it brought to you. But the next question would be now, would you say that development in Finn, the product development would have been also possible with that No-code and low-code tools on the same level without having your technical background? So just assuming you were not there or you studied also from a business background, so do you think even without your tech background, this would have been possible?

Andreas:

No.

Interviewer:

And you want to also elaborate why?

Andreas:

Now we're talking about, sorry, I'm a tech guy, I answered the question that you asked me. So the main reason why I put a lot of effort into that is because I want to ensure I did coding myself. I was a back-end engineer for decades. And what I want to avoid is engineering for the sake of engineering. That's wasting, because engineers, we as engineers, we have a great tendency to do things because they're fun, but they bring zero business. We are great in that. It makes us happy because this is the way we are. So long story short, and this is what I wanted to avoid, with No-code, you could exactly do that. What's the benefit for the engineer? You remove all the annoying tasks from the engineers, and a super annoying task is product feed export. For instance, if you run marketing campaigns on Instagram or on Metas, you have to export your product data, like ShowMe, which Audi's are available on Finna and what's the price. So Meta can show them on Instagram and Facebook, whatever. This task is super annoying for an engineer. That's fucking lame. When doing that with No-code, this is a great example so the engineer can exclusively focus on the tasks that only an engineer can solve because they're able to work with them. Is that? I hope I can build the house, but you wouldn't build the house, you think that's great. Because you know the result of building your house would be a disaster, right?

Interviewer:

No, it makes total sense. Great, great. And now we're coming to the second and last part of the interview, the one we didn't really want to spoil yet because now we want to understand more the side of the non-tech founders. And for that we already over the literature review and over other interviews collected the three most common ways of creating a product or creating a startup. And as we already talked a lot about it, one is the No-code and low-code solutions, but a second one would be to go with a technical co-founder if you are the business person. And the last one would

be to develop the product with external service providers, agencies, freelancers and so on and so on. And we just didn't want to take away from the beginning that you know which are the alternatives, just that you can explore yourself all alternatives. And for the last three questions we want to understand the influence your approach to go for a No-code-low-code solution had on Finn, especially in the beginning, in comparison to the other two solutions. And just to give you some background information inside your head, you don't need to specifically answer towards this fact, but just that you have some guidance where you could go with your answer. Factors we usually consider are market capitalization, time to market, capital efficiency and revenue. So we are always trying to look into the typical KPIs of a startup. And the first two questions you already touched on, so maybe you can just give a brief summary also here now, a little bit in the back of your mind, but this is mainly from a non-tech perspective. So the first question would be, what challenges do you think the No-code tool brings regarding these factors where you might perform better with a technical co-founder or in cooperation with external service providers?

Andreas:

Yeah, definitely. So the fun story, we had exactly this case with Finn. My interview was, hey, we plan to do this with an agency. I was like, guys, fuck that shit. They gave them an offer like, we can build it for 150,000 and I told them, so why you can build it for peanuts in a week with an intern, that money, actually it was speed. So time to market is the most essential one, especially when you think about startup. If they don't have no money, they have different problems, seriously. But it's time to market, that's the most important part. And I think it's very important to understand where, so what is the product you're building? If it's a commodity, B2C product, speed and to market is the key. To get clarity is this product working on. If you have likely B2B to ask for a product, it's hard to start with NOCOD because then you have to work and you would get the money increase you can see phase to build this product. Then you should start with a technical

Founder, especially if you have a technical, a very technical product. So it depends, I would think it from a product perspective. If you run a project business like similar to agency, you can go with NOCOD, if you're building a product and you know you're here to stay for at least two or three years, you should get the tech folder as soon as possible. A tech folder that is able to translate business KPIs. And this is something we are lacking in Germany and Europe massively. We as tech people are just too stupid to understand the business needs. What is AR? What is CIC? What is MPU? How is this wired together to produce MRO? Mixholicin is what especially a really nice differentiation from you besides the B2C and B2B differentiation.

Interviewer:

I think it's a really, really nice aspect. But going back to the question, can you identify any negative points where you say here NOCOD performs worse in comparison to going with a co-founder or the external service providers?

Andreas:

Yes, so you have to take into account that if you are getting more matured, this No-code solution should be and will be replaced to take that and to build your boat, to build this an IP, or to build this as you are. But this is more of a timing when to do that. How much can you squeeze out the peanuts or everything from the No-code solution? That's a timing issue. It's not a question if you should do it or should not. No, it's a timing. You have to do it at a certain point in time. But this is a sort of apologize, but in tech, you have to iterate your full tech stack every second year. Every two years you iterate through your tech stack and it doesn't even really matter if you're honest to yourself as a tech person, as a tech leader. And if you start with No-code, it will place this after two years with a No-code approach or No-code and then No-code and then again No-code, we did this exactly the same way we've been.

Interviewer:

Great, great. That's a really great answer. Thank you.

Andreas:

Otherwise, you're building a latency and then your company is losing the mode that it built up. At least from a tech perspective. In software service companies, this is an even more important topic.

Interviewer:

Yeah, no makes total sense. And now for the second last question, I think you already really touched a lot here. So I think for this question, and depending on your time constraints, it would be enough if you just summarize again what you already mentioned. It would be, what would you say were the main advantages No-code brought you in comparison to the co-founder and the external service providers?

Andreas:

Speed and that for regarding this comparison to the external provider, that we truly understand our business and what is to build. If you give it to an external party, they will kind of hold the knowledge, the process and muscles, process intelligence. So you're not owning your own IP and engineers versus hiring or having a tech founder, this tech founder would always tell you why you need more engineers and this is a cost. Speed and cost, let's say it's like that. It's a simple statement, but I think there's so much reality to that. If I have 10 million, it's easy to hire 10 engineers. If they have like a million just from a PC, a PC to a seat round, you would, you have to think a lot if you should hire 10 engineers. It's all about the money perspective.

Interviewer:

Yeah, understandable. And now the last question is a little bit more hypothetical and looking into the future. You're operating now in two industries more or less in the consumer tech and in the B2B entire software area. So if you want, you can also split up that question. The question would be, do we anticipate and changes in the next years regarding the approach of no code? So do you

think No-code and Low-code solutions will get more and more present in startups, especially for non-tech founders, if you look into the comparison with co-founders and service providers, or do you think it will get a little bit less and less present and why do you expect that development?

Andreas:

It's a really, really nice question. And I can tell you why. The nice part, let's place this as a second. For the, no code will pick up a lot. And including also, it's boosted with the whole AI, not movement, but rational. You can test and implement your ideas brutally fast. You get instant, almost instant, in a few weeks, months, feedback if your business ideas work, you know. That's the one thing. No code, that's the B2C thing, that's easy to, it's almost a no brainer. Using no code for B2B is an interesting one, you can do that. And we will see for a short amount of time, maybe for a year or two, a lot of B2B businesses trying to use no code to build their products fast, but the, how to call it, the tech gain or the tech density within this product is, let's say, how to call it, the real value of this product would not be as dense as with a, with a, with a hard code or coded solution. Why is this a problem? We would see more and more in these two years, simple, basic, no code B2B soft companies. And then we would see on that, so you would see a lot of crap, and we see, we will see, continue to see massive value B2B software company. And then we are calling, we're talking about the billion dollar company. We would have less of this mediocre companies. So what I expect is that we will see a big lift, so no code would, would ensure that this difference between the, so everyone would be able to build a business. The question is, is it a billion dollar business or peanuts? This will, will happen with no code and it will say, yeah, this is what I see will happen.

Interviewer:

Okay. So to summarize it on the consumer tech side, you see low code coming more and more and especially bringing more speed into it. And then the B2B software side, you also see no code and low code increasing, but here you don't see the effect that, or I don't expect the effect of increased

speed, but you rather see the effect of like a two class society of businesses. So you have the hard coded businesses, which will really get that unicorn status or have the potential to get there. And when instead of having a lot of other businesses, which lacking a little bit behind, but still are in a hundred million, hundreds of millions valuation, you rather have a way bigger stack of smaller businesses who have less quality solutions.

Andreas:

Indeed. That's the market. And now if you think about why is that business also because of the market situation. So imagine you are now a big company and you are equipped with no code. Like let's say just a few parts of your company are using the no code instead of just, and this is a real good example. So I would love to lower my software service costs. I gave this task, hey please lower my, give me a visibility, what are the software service tools that we use here within Finn? I gave this task to an intern equipped with no code skills. One week later, I had a simple tool I can see and reduce this cost. Half a year ago or two years, three years ago, I would buy a simple software service solution that claims that they can scan my infrastructure and give me a full inventory of the software tools that I used. So we'll see this difference between low quality software, local tool and high quality tools also not only from a market perspective, but also from a consumer perspective because they can do this simple, they can implement the simple software services themselves.

Interviewer:

Okay, great, thank you a lot, we have really, really interesting insights. Now just to quickly wrap it up, we have like quick fire and questions as for statistical mapping. In which year was your startup founded?

Andreas:

2019.

Interviewer:

Okay, and you already mentioned your educational background is computer science and what was the highest level of education you obtained there?

Andreas:

Master, Master of Science, yes.

Interviewer:

Okay, and the last one would be the type of your product here. We compare software, hardware, app, physical product, and so on, and so on.

Andreas:

Software first, second physical product because it's a car.

Interviewer:

Yeah, and it's both for B2B and B2C software, correct?

Andreas:

No app for B2C. No app for the B2C customer. We have of course an app that's a React Native command. We built a mobile website, you press React Native and done.

Interviewer:

Okay, okay, okay. Thank you a lot. Just up to you if and the results would be anonymized in the thesis or if we can use them together with either your personal name or in the thesis.

Andreas:

You can use both.

Interviewer:

Okay, okay, perfect.

Andreas:

Please send me the quotes if you could.

Interviewer:

Okay, we can do that.

Appendix 10: Interview 13

Interview 13 Interviewee: ID13

Interviewer:

Okay, so just one more confirmation. We would record the interview and we would also then transcribe it to put into the appendix of our thesis if it's okay for you.

Interviewee:

Yeah, sure. Perfect, perfect.

Interviewer:

Then in the beginning, can you provide a short introduction of your background, so what are you doing and also your company is doing?

Interviewee:

Excellent. So, well, in short words, we are a social enterprise and we connect businesses with English- speaking remote professionals from different countries. Mostly countries in Latin America, the Caribbean and also Africa, and they have a very good English level, so the client doesn't have to worry about communication difficulties, you know. And the reason why we work with people in these countries is because we see a need here, for example, I am from Venezuela, and here, yes, people can find a local job, that's fine, but we don't have fair salaries. Also, we have incomes in the local currency, which is affected by a very high inflation, so it's never enough, the payment that you get, and also sometimes being a freelancer, you don't have that stability or safety while trying to get paid and find clients. So, what did we do? We started recruiting a couple of people from these countries that were having these problems and offered them better incomes, incomes in US dollars, which is a lot more stable, and also we look for the clients for them to feel safe and also have better security about their payments. So, they avoid being scammed in the internet. I don't know what's your experience working online, but you have to be careful because, of course, you need to find a secure job there, so that's what we offer. Besides that, and this is just in development, we're starting to offer a health insurance program where we help them pay a health

insurance so they can increase their quality of life. Of course, that's something that we're doing because we want to grow as a company and also try to give them enough benefits, benefits that they wouldn't have by working by themselves in platforms like Upwork, Fiverr, and through us.

Interviewer:

What is your current experience if you're focusing now on the part where you said you have the well-ops, where you match the well-ops as contractors or external service providers with other companies? What is your experience of that, especially with startups, for example?

Interviewee:

Yeah, so one of the most common kind of companies that we work with are startups because, of course, it's a very flexible and affordable way for them to recruit people. Versus competing with the US market, we offer better pricing and also more flexibility because we work entirely by the hour, so the client has the freedom to decide how many hours that person will be working and we don't offer this kind of full-time contract or full-time contract, so it's great for startups. The most common roles that we have in professionals are virtual assistants, but we also have more specialized kind of professionals such as video marketers, graphic designers, video editors. We have senior copywriters and developers as well, like software engineers, web developers, app developers, etc.

Interviewer:

Okay, nice. Thank you. Just one clarification question you said that speaking about, for example, the well-ops now will get paid by the hours. Are you also having the option to pay by the project, but you say I want this app and then you pay only for the app independently of the work input by time?

Interviewee:

Yes, exactly. Entirely by time. We don't have fixed prices, let's say, a website will cost this amount. We don't work that way, we only work by the hour, and usually when it's only one project that the

client needs, we ask the worker how many hours he would take them to actually work on that, so we can give them the pricing based on that. And also we have a flat rate per hour, so it doesn't increase. It will stay the same depending on the role and also depending on the level of experience that they have.

Interviewer:

Okay, got it. Thank you. And would you say that to use your service and especially focusing again on software engineers and web developers, is it possible for everyone to use your service, even if I or the person wants to use the service, don't have the technical background, or would you say there's some technical background required to be able to communicate properly what is needed and to also receive the quality which is expected?

Interviewee:

From the start-up side.

Interviewer:

From the start-up side.

Interviewee:

Well, each worker declined to have expertise in the area, because that's why they are a recurring professional, so they can help them with any area that they need help with. But it depends, of course, they would at least have a knowledge of what they would be assigning to these professionals, so they can, the hours that they paid are accurate and have actual results, but of course it depends on every company, every person, and all the professionals that we have already have expertise in the area that they work with. Because we have another agency that takes care of all the record and process, so we can make sure that the people that we provide to the clients are people who actually have the skill sets that we offer.

Interviewer:

Sorry, I mean it actually the other way around, so maybe to clarify again, I was talking more from does the client need a basic technical knowledge to be able to work together with you, or is it possible for every client to work with you, even if there's zero technical pre-knowledge?

Interviewee:

It's possible with both. Of course it's better if the client has some technical knowledge, so they can communicate the requirements of the tasks in a better way, but we have clients who have the technical knowledge and clients who doesn't.

Interviewer:

Okay, got it, thank you. And now for the second half of the interview, we would like to understand the use of using external contract providers or external service providers for non-tech founders, so we really want to understand now how useful what are the benefits, what are the risks from the start-up side. If we're talking about a non-technical founder, how can your service be useful or also risky for them? And for that we want to compare it especially with the other two options we already touched on, of going with a technical co-founder or also using no-code tools. And just to give you some borders where you can put your answer in, you don't need to specifically go into detail here, but just where you have some guidance and factors we would consider to analyze how useful it is could be market capitalization, so how it influences the value of the company of your client, the time to market for the product, the capital efficiency, and also the revenue of your client's company in the end. And for that, for the first question we would like to understand what are challenges or risks which go together with the client by using a service like yours, by going together with external service providers.

Interviewee:

Well, the challenges would be that, of course, remote work is different than local work, and by this I mean the communication side, also the sharing of documents as well. Declines should have a

knowledge of maybe, well, communicating through platforms like Slack, Microsoft Teams, so they can, the client needs to be able to communicate and work remotely, I don't know if I'm explaining myself. For example, knowing that that person is also in another time zone, so they wouldn't be sharing the same time, maybe when that person is working, the other one is sleeping, that kind of things can be considered challenges, but those are feasible as well. Everything comes with an agreement. I don't know if I'm responding the right question.

Interviewer:

No, definitely, definitely goes into the right direction. Do you have any more aspects to add to this, or would you say these are the main challenges?

Interviewee:

Yes, the main ones. The usual challenges are this, the communication side, the time zones as well, in this case that we work with people in other countries. Also, sharing the information, they need to establish a channel of communication to share the documents, et cetera, and also, well, yeah, I think that's the only one. As well as some clients sometimes have issues by sharing their personal data, or, for example, their accounts, but nowadays, in remote work, there are a lot of tools for this, for example, password managers, where you can share a temporary password so you don't get full access to the remote worker. So that's something that most of our clients use, and that's a very good alternative.

Interviewer:

Yeah, got it, thank you. And now turning it exactly around to the question, what would you say are the main benefits a client can get when working with you or other companies providing these services with external contractors, and clearly in contrast to going with a technical co-founder or using no-co-tools to develop the product themselves?

Interviewee:

Well, remote work has its challenges, but it's also very quickly, because you're only a computer away, so it's great because it's a lot more simple and also, in the model that we work, as we work entirely by the hour, that person will only pay by the time actually worked in their project. So they don't have to pay for packages, and then maybe some hours were lost and they pay extra for that, so it's better for budgets that they work entirely by the hour so they can control how much they're going to spend on this project. And this helps a lot to entrepreneurs and also startups.

Interviewer:

Okay, got it. So the main benefits would be that it's really fast to get started and also that you never pay more when agreed on, correct?

Interviewee:

Exactly, only the things that you actually need, and also well, and this depends on the agency of course, but in this kind of agency where we, the people that we recruit are passed through a screening process, it's safer than hiring someone in platforms like Upwork or Fiverr where anyone can just sign in and that's it. If you don't really have a filter of who you're working with, in this case they are because we make sure that the workers that we have are reliable, that they have a good background, they have the right equipment to work with, etc. So we can provide a good quality of service.

Interviewer:

Great, great, got it. And now to the last question, do you anticipate for the future that the service of using external contractors to create your startup and especially to create a tech product in the beginning of your startup will play a more big role or a more small role in the next years in general in the startup world and why do you think that this change will happen?

Interviewee:

Big role actually, I think it will increase because in the past few years since the pandemic, more

people see the value of remote work and the benefits of remote work. Nowadays, well, and we've been confirming that with the increased number of clients that we've been having this year, even more companies are going online. Mostly for roles like virtual assistants, very simple virtual assistants, creating of websites, also graphic design projects. So it's great for startups for them to have a more affordable way to get better results.

Interviewer:

Okay, and do you, besides what it's growing, do you also anticipate any changes in how it will work, for example, in general changes in this industry?

Interviewee:

Well, besides more people joining, also, some people are creating tools and alternatives for this. For example, the one that I mentioned, password managers. This has been very positive for this industry because it makes easier all the process. Also, some platforms like Slack, I don't know if you know it, but it's like an online office. It makes the process of working remotely a lot more easier and there is transfer and other tools that are emerging nowadays. And I think that in the future, remote work will be a lot more simple.

Interviewer:

Great, great. Thank you. So now, to the end, I'm off to interview just some mapping questions.

When was your company founded?

Interviewee:

It was founded five years ago. I was not the person who founded it. It was (name anonymised for confidentiality reasons). I joined almost three years ago. But the company really started to grow, was independent, of course, because a lot of people have to go online from the worker side and from the client side. And that's when we started growing. And I'm going to share with you an article that we have in the (newspaper anonymized for confidentiality reasons) that talks more about how

it's started and how it's helping other people in my country at least. So you can check it out and maybe you can use it for your thesis. But yes, and nowadays we have around a hundred active workers so far from all these different countries and we're looking forward to grow more.

Interviewer:

Great, thank you. And almost last one would be what is then your position in the company and also the background you're coming from. So did you study business or do you come from more technical perspective?

Interviewee:

Actually, I studied modern languages and cultural aspects and that's a very positive part in this kind of agency because we work with different cultures. Of course, every agency is different, but in this one we work with different cultures so it's necessary.

Interviewer:

Okay, and your role in the company is? Because you said you didn't found it?

Interviewee:

I am client manager and also team manager.

Interviewer:

Okay, and the last one would be how do you deliver your service to your clients because I guess you will not have an office where the startups will go to (location anonymized due to confidentiality reasons) to speak with you. So are you having an app for this? Are you doing it over software or are you calling clients? What is the process like? How you're delivering your service?

Interviewee:

Good question. Well, we do have an office in the US, however we'll work remotely so our main channel of communication with the clients is through the emails. (name anonymized for confidentiality reasons) is the main contact for all of them and (name anonymized for

confidentiality reasons) shares communication about more like the administrative part and making sure that everything goes well. But when it comes to the actual work, the ongoing communication about the projects, it is directly with the worker, right? We usually don't manage that communication unless of course it's necessary to participate in it.

Interviewer:

Okay, perfect. Thank you a lot. But would it be then from our side then you can just come back to us by email or whatever is your preferred channel to let us know if we're allowed to use your company name and be then also your personal name to show in our thesis who we interviewed and in which company.

Interviewee:

Excellent, yes. I would have to give you the confirmation about it. And well, if you would be interested in maybe trying out the service or recommended that to other people, please let us know.

Interviewer:

Yeah, definitely. Thank you.

Interviewee:

Thank you.

Appendix 11: Themes

Themes
1. Personal : This theme comprises personality traits, with a focus in trust and motivation. It explores communication between counterparts, personal investment and fit and transparency in product development and decision making.
2. Speed : The time needed to develop a product and launch it in the market are the main results aimed at being explored here, always putting speed as the central of the question.
3. Cost : As a crucial part of decision making, the cost of developing a product and its implications will be further analysed in this category.
4. Product : This theme explores the aspects related to product quality, number of interfaces required, and the expertise needed to develop it.
5. Fundraising : Here it is highlighted how easy it is for the founders to get access to capital as well as the criteria they find crucial before reaching investors.
6. Outlook : Lastly, in this theme a closer look will be taken at the future trends' founders are expecting in terms of product development.

Appendix 12: Question types

Question type	Frequency
Demographic questions: Founder	4
Demographic questions: Startup	4
Product development approach	1
Success measurements	6
Weighting of the success measures	1

Appendix 13: Descriptive statistics No-code & outsourcing

No-code & outsourcing							
	Time to market (months)	Market capitalization (€)	Revenue Y1 (€)	Revenue Y2 (€)	Cash burn Y1 (€)	Cash burn Y2 (€)	
AVERAGE	4.0	1000000	10000	n.a	n.a	n.a	
MEDIAN	4.0	1000000	10000	n.a	n.a	n.a	
STANDARD DEVIATION	n.a	n.a	n.a	n.a	n.a	n.a	
FREQUENCY	1.0	1	1	0	0	0	

Appendix 14: Descriptive statistics Co-Founder

Co-Founder							
	Time to market (months)	Market capitalization (€)	Revenue Y1 (€)	Revenue Y2 (€)	Cash burn Y1 (€)	Cash burn Y2 (€)	
AVERAGE	9.3	2800001	3	7502	15002	35003	
MEDIAN	3.0	2800001	3	7502	10000	35003	
STANDARD DEVIATION	12.7	3959797	n.a	10604	18026	49493	
FREQUENCY	3.0	2	1	2	3	2	