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OPTIMIZING PRODUCT-MARKET FIT: A DIGITAL MARKETING APPROACH FOR PERFORMANCE MEASUREMENT

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To my mum and my family

"Man is not what he thinks, but what he does".
Mesa Selimovic, Death and the Dervish

ABSTRACT

In today's digital economy, digital marketing has grown in scope and now acts as a liaison connecting digital interactions and key start-up activities. The low investment and dynamic elements of digital marketing favor the start-up environment and enable a flexible match between digital interactions and start-up growth. However, start-ups are usually unfamiliar with all the possibilities digital marketing offers and connect its influence solely with marketing and sales. Digital marketing, powered by data analytics, can support start-ups in different key activities such as testing and experimentation, customer education, and others. This thesis first explores how digital marketing impacts start-up development within a set of growth drivers supporting different key activities and associated areas. Through a systematic literature review, the Macro-dynamic Framework was developed to identify and connect fifteen growth drivers and digital marketing impact for achieving start-up growth in four different areas.

Secondly, as Product-Market fit is identified as one of the key drivers of start-up growth, this research focused on investigating how can product-market fit be influenced through digital marketing. One of the major challenges start-ups have in this perspective is measuring digital marketing performance and interpreting the collected data. As Product-Market fit and performance measurement both largely rely on the provided digital marketing analytics and received feedback, the DM_Optima framework is developed to connect the touchpoints of both areas. Through multiple case study research with nine start-ups, the thesis demonstrates this Framework application. The DM_Optima Framework is developed with a Balanced Scorecard and enables start-ups to test their ability to optimize product-market fit through digital marketing and performance measurement. The results of DM_Optima help start-up founders and managers to achieve or maintain their product-market fit and establish efficient practices of digital marketing performance measurement from an internal organizational perspective.

Keywords: start-up growth, digital marketing, digital experimentation, digital marketing analytics, performance measurement, process development

RESUMO

Na economia digital de hoje, o marketing digital cresceu no seu âmbito e actua agora como um elo de ligação entre as interacções digitais e as principais actividades de arranque. O baixo investimento e os elementos dinâmicos do marketing digital favorecem o ambiente de arranque e permitem uma combinação flexível entre as interacções digitais e o crescimento de arranque. Contudo, as start-ups não estão normalmente familiarizadas com todas as possibilidades que o marketing digital oferece e ligam a sua influência apenas ao marketing e às vendas. O marketing digital, impulsionado pela análise de dados, pode apoiar start-ups em diferentes actividades chave como testes e experimentação, educação de clientes, e outras. Esta tese explora primeiro como o marketing digital tem impacto no desenvolvimento inicial dentro de um conjunto de factores de crescimento que apoiam diferentes actividades e áreas associadas. Através de uma revisão sistemática da literatura, a Estrutura Macrodinâmica foi desenvolvida para identificar e ligar quinze motores de crescimento e marketing digital para alcançar o crescimento inicial em quatro áreas diferentes.

Em segundo lugar, uma vez que o ajuste Produto-Mercado é identificado como um dos principais motores do crescimento inicial, esta investigação centrou-se na investigação de como pode o ajuste produto-mercado ser influenciado através do marketing digital. Um dos maiores desafios que as novas empresas têm nesta perspectiva é medir o desempenho do marketing digital e interpretar os dados recolhidos. Uma vez que a adequação e a medição do desempenho do produto ao mercado dependem largamente da análise de marketing digital fornecida e do feedback recebido, a estrutura DM_Optima é desenvolvida para ligar os pontos de contacto de ambas as áreas. Através de múltiplos estudos de caso com nove start-ups, a tese demonstra esta aplicação da estrutura. A estrutura DM_Optima é desenvolvida com um Balanced Scorecard e permite às start-ups testar a sua capacidade de optimizar a adequação do produto ao mercado através do marketing digital e da medição do desempenho. Os resultados da DM_Optima ajudam os fundadores e gestores em fase de arranque a alcançar ou manter a sua adequação ao mercado

de produtos e a estabelecer práticas eficientes de medição do desempenho do marketing digital de uma perspectiva organizacional interna.

Palavras-chave: start-up crescimento, marketing digital, experimentação digital, análise de marketing digital, medição de desempenho, desenvolvimento de processos

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ACRONYMS

PMF	Product-Market Fit
DM	Digital Marketing
MVP	Minimal Viable Product
NPD	New Product Development
SMART	Specific, measurable, achievable, realistic, and timely
SOSTAC	Situation analysis, objectives, strategy, tactics, actions, and control
RACE	Research, action planning, communication, and evaluation
SWOT	Strengths, weaknesses, opportunities, and threats
ROI	Return on Investment
CRM	Customer Resource Management
AR	Augmented Reality
AI	Artificial intelligence
ML	Machine Learning
UX	User Experience
UI	User Interface
CLV	Customer Lifetime Value
NPC	Net Promotor Score
CPA	Cost per Acquisition
AHP	Analytic Hierarchy Process

1. INTRODUCTION & PROBLEM AREAS

Developing new strategies to engage and respond to customers' needs has positioned digital marketing as one of the key elements of running a business. Examples of combining digital environment and marketing data have already proven to be an effective model for getting higher customer reach in a specific market niche. The contemporary business model requires both, corporates and start-ups, to engage in the dynamic use of digital marketing tools and strategies, and interpret data into decision-making actions. From just starting as a team of founders of early-stage start-ups to designing a new feature, or products/services as a scaleup, the business model development requires certain resources to encompass new insight, smart data (Peter et al., 2020). Within this digital context, digital marketing is becoming a powerful mediator between efficient digital interaction and start-up growth.

1.1. Digital Marketing influence in a Start-up environment

As start-ups usually struggle with customer engagement, retention, and other growth challenges, there is an evident need to utilize different strategies and impact these challenges. Although marketing and sales are still considered as base components of all marketing (online & offline) activities, the new digital marketing paradigm has moved its impact far beyond its traditional role. Digital marketing encompasses all marketing techniques and strategies that utilize electronic devices, including online marketing activities conducted on the internet, and involve some form of computer technology (American Marketing Association, 2020). Digital marketing strategies are now used to reach, test, acquire customers, partner up with stakeholders,

and build online communities. But the usual scenario is that start-ups are mostly unfamiliar with the digital marketing composition of possibilities and don't use digital interactions with customers in their full capacities (Akter and Iqbal, 2020). As part of the answer to today's fast-changing and unpredictable market, digital marketing tools and strategies possess two elements especially interesting to start-ups - a low investment character (in comparison with traditional tools) and quick market utilization, powered by data analytics. Meaning that in organizational terms, digital marketing can also be understood as a start-up testing area, with an opportunity to get fast customer feedback and impact value proposition. As the build-measure-learn loop is a crucial concept in problem-need understanding for a start-up's value proposition (Ries, 2011), digital marketing analytics can form insightful connections between start-ups and growth areas, ultimately leading to higher conversion rates. The strategies can be used for several key activities, starting from the early stages (e.g. idea validation) to more sophisticated actions through growth hacking practices. From E-mail marketing, Social Media to SEO, digital strategies aim to reach different objectives and are used as tests to investigate what works best, measure the findings, and iterate. Basically, digital marketing, when properly used, can represent a shortcut in growth acceleration for start-ups in different key activities.

1.2. Start-up challenges and growth through Digital Marketing

One of the main difficulties start-ups are facing is figuring out when to employ the right strategies and how to properly utilize digital opportunities. An even more challenging (opportunistic) situation for start-ups is that their starting position can be favorable toward a focus on innovative and novel concepts. However, this process is in parallel followed by scarce resources, a lack of continuous marketing activities, and a strong focus on technical start-up development (Giardino et al., 2015). Start-ups also have high levels of resource constraints, time pressure of *as soon as possible* breakthrough solutions (Conway and Hemphill, 2019), and prioritization needs while discovering their product-market fit. Founders usually lack experience (technical, marketing & sales, leadership), and balancing all the challenges of running a start-up is truly a grand endeavor. This continues the narrative of developing entrepreneurial skills team

members need to have along with different kinds of networks to increase their effect and impact (Fernanda Llussa, 2023).

Start-up as a concept has several stages of maturity, followed by challenges connected to each maturity level. Some of the hardest battles for newly founded start-ups are validating their ideas on the market. These activities challenge teams to research, test, and have the customer's problems understood in such a way as to recognize their “pains” and offer solutions. Also, in the initial development stages, start-up variability moves between understanding the problem/solution fit and the behavioral execution of pursuing the product-market fit (Giardino et al., 2014). Therefore, transmitting the message to a specific audience at the right time, and using insights to optimize product development inevitably fits the start-up's spectrum of usage. A point that digital marketing can offer through its channels. Questions of trust, engagement with low costs, and testing of the working prototypes are points upon which every start-up team is focused in the early stages. Business entities have benefits while sharing their experiences, joining networks, or building partnerships (Ormazabal et al., 2018), which start-ups can also design through digital channels. Additionally, for digital start-ups answering the question of how to effectively build the user community is essential for early-stage start-ups (Standing and Mattsson, 2016).

As start-up matures, the needs are more focused on stabilizing business processes (supported by smart data), progressive brand building, and customer retention (Kim et al., 2021). Even the most successful start-ups in their industry need to have continuous adaptations of their digital content in line with their offerings in local and international markets. As presented by Zomato, the food-aggregator start-up, in order to remain one of the industry leaders, the team constantly tests and works on designing the high-quality content used for digital marketing, optimized for each local market (Raman and Raman, 2018). This leads to two points, first is to recognize digital marketing as a continues conductor of a customer-centric approach impacting start-up growth (from local to international markets). Secondly, even with industry leaders the question of which strategies to utilize and which test to employ, iterate and integrate insights, remains a challenge.

Furthermore, as strategic points of general marketing usage can be designed through dynamic marketing capabilities into agile marketing frameworks (Moi and Cabiddu, 2021), this leads to recognizing marketing activities as more impactful in the overall organizational maturity. Within digital marketing opus, the impact on key activities can be identified in several points, from customer engagement and sales powered by analytics (Peter et al., 2020), content for customer education (Ho et al., 2020) to supply chain management (Hartono et al., 2020). As researched through the existing data, the impact is scattered around many activities and not comprehensively identified or mapped. If one digital marketing strategy and tactic can be used to effectively impact one or many activities with high return rates, these inputs would be a helpful tool for prioritization and decision-making. From a strategic point, it would be valuable to identify what kind of overall influence digital marketing can have on start-up growth.

Also, the important fact in the start-up context is to recognize in which activities impacting growth, digital marketing can be used in different combinations and how? These actions can save time and have a more focused approach to matching the right activity with a specific digital marketing strategy (or tactic). For example, engaging video content is used for Lead Generation and helps with a purchase decision. Nevertheless, it's also a proven way of building customer relationships as interesting videos will be shared by customers making an effect of virtual WoM - word of mouth (Gupta and Nimkar, 2020). In situations such as this one, digital marketing strategies also serve as business development tactics connecting different points of start-up growth (lead generation, brand building) with customer-centric activities. Having a concrete identification of which digital marketing strategies support start-up growth allows start-ups to plan strategies from a different point of the customer journey and design dynamic interaction.

What singularizes as an important digital marketing advantage is that while running different digital marketing strategies, there is no grand difference between start-ups and corporates in the aspect of data obtained. Even though corporates might invest more, start-ups can use the same methods and collect data within a similar scope. With the collected data and analytics, the

interaction can be upgraded to the point of higher customer engagement. The digital format of interaction enables scaling, fast growth, and engagement in which the objective *is not selling, but engaging'* through continuous interaction based on various digital platforms (Mingione and Abratt, 2020). Corporations can have the advantage in the skills and resources sections (data transferred into insights), but this fact does not exclude start-ups from doing the same activities and connecting data with their value proposition. This exactly points out the universal opportunity digital marketing offers, strategies can be utilized by anyone (with a certain level of knowledge and resources), to gain insights from digital marketing activities and impact different growth drivers.

Therefore, although examples of digital marketing impact across different start-up activities and areas are evident, there is no concrete mapping of the exact impact digital marketing has on start-ups, beyond marketing and sales. Thus, there is an existing need to establish this identification as it will practically help a start-up to be more familiarised with which strategies and tactics can be implemented for particular key activities in different growth areas.

1.3. The Research Problem and Opportunity: the (continuous) search for Product-market Fit

The next crucial distinguishing component digital marketing has above other concepts is the availability to test aspects of product and market components through digital channels. The value of testing is unmistakably one of the key enablers of the digital economy. It saves money, time, discovers the customer's needs, and can lead to easier decision-making.

In the general narrative of start-ups, nurturing the experimentation culture is one of the cornerstones of start-up growth. Thus, testing and experimentation of start-ups through digital marketing represent a collection of new insights and opportunities for growth, especially with software start-ups (Gupta et al., 2020a). One specific process which can be outlined as a continuous process, especially connected to start-ups, is testing for the product-market fit. As

product-market fit has also been identified as one of the start-up key activities impacted through digital marketing, the process of achieving and maintaining the Fit through digital marketing is included as the subject of investigation through this work. Figure 1.1. presents the Research Problem & Opportunity Roadmap of this research. Starting with identifying how digital marketing impact several key activities and areas (in this work identified as Growth Drivers), the research further focuses on identifying how digital marketing can support the process of product-market fit, as one of the key drivers of start-up growth.

Product-market fit signifies a position in which products satisfy the market need. To achieve product-market fit, several activities need to be carried out: starting from market research, defining the value proposition and minimal viable product (MVP), testing it with customer segments, iterating, and validating the product.

Figure 1.1. Research Problem & Opportunity Roadmap

A search for product-market fit starts with the initial start-up idea but does not end at this point. Since the digital age is also the age of fast-changing environments and markets, establishing the initial product-market fit does not necessarily mean experimentation is done. On the contrary, as the product-market fit is a cornerstone of start-up survival, maintaining the fit is also crucial for start-up business models and growth determination. Maintaining product-market fit points out the need to regularly monitor its performance (from the product and market side) and make needed adjustments. Since business models (or their aspects) continuously need to be adapted for new products, customers, markets, features, or other components, so is the need to maintain the right Fit. In this perspective, the product-market fit concept is a continuous search/calibration, starting from early-stage start-ups (which are trying to reach the Fit) to more stabilized, mature start-ups (that need to maintain their market position) and the right Fit.

Product-market fit can be tested through digital marketing channels by simply creating a hypothesis on a product (performance, features) in the selected market, and then using digital marketing channels to obtain data and feedback. Within the product-market fit activities, a considerable number of digital marketing strategies & tactics can be employed, measured, and support the decision-making process (from feedback received through social media channels to more sophisticated strategies through growth hacking). Their success (or failure) can be measured, optimized, and ultimately used as a direct tool supporting the right fit calibration. Each start-up has its way of establishing product-market fit, but when given insights on which strategies can be implemented and their performance measured, the information can serve as a guiding tool in the start-up's experimentation process. By utilizing digital analytics, start-ups can track crucial performance indicators such as conversion rates, customer acquisition costs, and determine which marketing channels and tactics are most effective. This enables them to make informed decisions based on data, and improve their market and technology aspects (Bekhradi, 2018) while enhancing their chances of achieving product-market fit.

Nevertheless, despite the benefits of collecting data from multiple digital channels for performance measurement, a major existing challenge is the increasing complexity of interpreting

and properly maneuvering different and large amounts of data. Each channel generates substantial amounts of data (such as engagement metrics, and bounce and conversion rates) which need to be understood, properly maneuvered, and used for decision-making. For example, in achieving product-market fit, collecting and analyzing customer feedback is one of the main activities. Start-ups usually communicate with customers on multiple platforms and channels (e.g. social media, emails, surveys), create metrics to follow the customer journey/sales funnel, and collect feedback based on data points (such as demographics, purchase history, reviews or usage patterns). If the metrics and feedback are not organized, the team may not be able to effectively analyze the feedback, and measure the performance of obtained data. This can lead to inefficiency in classifying customer segments and what specific issues or concerns they have. As start-ups have also the challenge of mistiming the product and developing a user-unfriendly experience (Akter and Iqbal, 2020), the inefficiency of feedback organization can also lead to teams not being able to identify patterns and trends of product development. Thus, for data obtained from digital marketing to give insights, start-ups need to design a data-driven environment supporting the interpretation and performance measurement of digital interaction.

In parallel, the utilization of digital marketing strategies is closely linked with internal capacities the team employs for data interpretation and performance measurement. As digital experimentation and product-market fit activities outline the usage of digital marketing analytics and enablement of a performance measurement environment, the need to track, measure, and optimize this process positions itself as one of the crucial start-up processes. Meaning that, as people and processes are the most challenging points in understanding data analytics (Chaffey & Patron, 2012), and internal resources essential for product-market fit activities such as MVP development (Tripathi et al., 2019), the proper usage of start-up digital marketing analytics depends on its internal team ability to maneuver and act on the data. Moreover, it's often easier for businesses to establish a good digital analytics practice when there aren't existing processes and entrenched habits slowing down the progress (Stéphane Hamel, 2018). This signifies that start-ups are in a better position than mature industry players and that they can use their

development momentum of setting the environment for proper data interpretation right from the start.

All the mentioned points emphasize an opportunity that start-ups can use insight from digital marketing channels to support their product-market fit. In this process, the start-up's ability to evaluate the performance of data received from digital marketing channels, and use it for decision-making is crucial. This outlines the need to further investigate how digital marketing and its performance measurement help start-ups in defining their product-market fit. Therefore, the process of digital marketing performance measurement transcends into a strategic opportunity to optimize the performance measurement process of a start-up's digital marketing activities, interlinked with product-market fit calibration.

1.4. Research Motivations

The purpose of the thesis is to identify how digital marketing helps start-ups to grow. Primarily, the work focuses on recognizing how digital marketing can be used in start-up activities to support growth in different areas. The research started with identifying different start-up functional areas in which digital marketing can support the development of specific activities connected to those areas. Having a comprehensive mapping of digital marketing impact on start-ups can outline the usage of specific strategies for the targeted *growth drivers* (development points connecting digital marketing impact and start-up key activities leading to growth). This way start-ups can have a grand picture of possibilities, and identify digital marketing support specifically connected to the challenge they want to overcome. This resulted in identifying 15 growth drivers influenced by digital marketing and what kind of digital marketing strategies & tactics can be used to influence these drivers (presented in the Macro-dynamic framework).

As the research on digital marketing evolved, so did the interest and its purpose. While discovering the macro impact digital marketing has on start-ups, research led me to understand how one of the most sophisticated (and in many ways intuitive) processes can be supported

through digital marketing – the Product-Market Fit. The way how different founders and teams work towards the Fit achievement is a personalized pathway using many available strategies. How to balance the tools and strategies, why one strategy is more effective than another, and what is their roadmap of understanding this interesting and intrinsic process turned out to be the next research point. Certainly, as this subject is sometimes even more abstract than tangible while designing processes connected with behavior, it needed to be grounded in a practical scope of understanding how data interpretation from digital marketing is turned into insights. In this investigatory path, the identified setting to enable this transition was done in two points: identifying and connecting the product-market fit activities with digital marketing support, and how the process of digital marketing performance measurement can be refined with the product-market fit points of development. As researched through the literature, the current body of knowledge lacks this understanding in the start-up environment.

Given these insights, the investigation focused on a deeper understanding of start-ups' ability to use data provided by digital marketing to support achieving and maintaining their product-market fit. One of the key points of defining product-market fit is measuring the activities and interpretation of the given results. Tracking, analyzing, and measuring data within the area of product-market fit and experimentation on digital channels was designed in line with digital marketing performance measurement. As the search for product-market fit and digital marketing performance measurement in this case depend on data provided by digital marketing analytics, the investigation led the researcher to design the framework encompassing the touchpoints of the two areas.

As in any process-related activities, during this research, it was also established that a strong influence on product-market fit have internal team capabilities to analyze and employ the data. How start-up teams can interpret data, and what kind of culture needs to be designed to enable a data-driven environment were identified as important components for the process of achieving (and maintaining) product-market fit. In this perspective, the research further included Internal process Development and Culture as complementary points of framework development.

Lastly, as the researcher's motivation was also to have a thesis whose results can be practically used by start-up teams, two main contributions were designed. Firstly, the Macro-dynamic framework can guide start-ups on how digital marketing tools, strategies, and tactics can be used to support the development of fifteen growth drivers. And secondly, DM_Optima, a constructive Framework for testing the start-up's ability to use and optimize digital marketing performance measurement in defining the product-market fit.

1.5. Research Questions

The research questions and propositions are crucial for each research as they guide the investigation and help in identifying the scope and path of the research subjects. This research has four research questions and two propositions connected to the research questions.

RQ1. How does digital marketing support start-ups to achieve growth in key activities across different areas, beyond marketing and sales?

The implementation of products (or adjustments) in a start-up environment requires a coordinated program of activities across functional areas including product development, team, sales, marketing and others (Besker et al., 2018). As start-ups operate with limited resources, the evident need exists in implementing strategies available from different sources and channels, impacting the key activities on a more coordinative level. The prospect of digital marketing for start-ups includes a range of different growth possibilities and can be considered as part or full solution for challenges in different start-up key activities and areas. Beyond its usual role, the impact of digital marketing can be identified in activities such as customer engagement, product-market fit, internal capacity building, and others. With this notion, digital marketing becomes a strategic tool driving the growth streams of different start-up activities through its digital strategies and channels. Thus, this question is focused on identifying which start-up functioning areas and corresponding key activities can be impacted through digital marketing strategies.

To answer this question, a set of growth drivers connecting the key activities and digital marketing impact will be proposed to identify the impact across product, market, team, and financial areas. The growth drivers will be encompassed in a Macro-dynamic framework identifying four different areas and fifteen key activities of start-up growth impacted through digital marketing. Through the second chapter of this work, the key activities and areas impacted by digital marketing are identified, while the structure and usability of the framework are identified in the fifth chapter.

RQ2. How can start-ups use digital marketing to impact their product-market fit?

As the Macro-dynamic framework revealed a number of areas in which digital marketing support start-ups in their growth, the product-market fit was identified as of the most important points in start-up development. Thus, how digital marketing is used to support this growth driver emerged as a question of interest in line with this work. Surpassing its traditional functions such as building brand awareness and sales increase, digital marketing can also be used for product and market development activities. Product-market fit signifies a point at which the customer is satisfied with the product or service. Establishing and maintaining the Fit is a diverse process for each start-up. Early-stage start-ups struggle with making the fit, while more mature ones need to maintain the product-market fit and remain competitive in different markets. Finding and maintaining the product-market fit needs to be re-evaluated every time the characteristics and needs of users evolve (Jock Busuttil, 2021). Through digital marketing strategies, tactics, and analytics the search for product-market fit can include various activities, from the initial research on the market discovery to product testing and validation.

These notions led this research to have a deeper focus on establishing the connection digital marketing has within the process of product-market fit, as this interesting bond, requires further research and understanding. Based on the research of digital marketing, analytics, product-market fit, and their mutual link, the Product-Market Fit Activities & Digital Marketing Support Identification will be made. This identification connects activities supporting product-market fit and how digital marketing strategies and tactics can complement the activities. The Product-

Market Fit Activities & Digital Marketing Support Identification will be described in the third chapter and also tested with nine case studies of the research.

RQ 3. How can start-ups use digital marketing performance measurement to optimize their product-market fit?

Digital marketing performance measurement is a dynamic process of establishing the proper set of measurement content, metric systems, and applications to organizational activities. Its optimization can help start-ups to understand their current positions and have input on what can be modified or updated towards higher optimization of their digital marketing analytics ability.

Digital marketing analytics is one of the measurable outcomes of digital marketing usage. As start-ups have different practices, investments, and operational processes when it comes to performance measurement, the effective usage of digital marketing analytics will be investigated with digital marketing performance components. Based on the existing research, the specific components from start-up activities connected to product-market fit will be applied to design the digital marketing performance measurement framework fitting the start-up context – the DM_Optima Framework. In the fifth chapter, the DM_Optima framework will be described and proposed to outline the start-up's ability for optimizing the product-market fit through digital marketing performance measurement.

RQ4. Does start-up maturity profile influence their ability to use digital marketing performance measurement for product-market fit?

As digital marketing performance measurement includes practices that need resources systematically to be developed and used, the start-up maturity is identified as an impactful element of performance measurement ability on product-market fit optimization. To explore this correlation between start-up maturity and start-up's ability to use digital marketing performance measurement for product-market fit, the DM_Optima will be tested on nine start-ups of different maturity profiles and with two research propositions:

Proposition 1. Start-ups with higher maturity profiles better utilize the digital marketing performance measurement in defining their product-market fit.

Being that digital marketing performance is defined by data analytics and metric systems, the process of performance measurement along with other important components from the start-up environment can be applied to discover the practical utilisations of digital marketing performance measurement interlinked with product-market fit. Start-ups with higher maturity profiles possess resources for a better definition of their performance measurement processes, but they also have a constant challenge in designing new product offerings and maintaining a competitive and technological edge (Raman and Raman, 2018). To explore this process and establish the differences in performance measurements for start-ups of different maturity profiles, the DM_Optima framework will be applied, along with start-up maturity elements. Through its application, different levels of performance measurement will be identified based on the established components connecting digital marketing performance measurement and the product-market fit. The case study research will be conducted with nine start-ups from early-stage to more mature profiles (along with their product offering stages), and the application of the proposed framework will be tested.

Proposition 2. Start-ups with higher maturity profiles have structured methods of developing creativity in their teams as a necessary skill for maneuvering digital analytics.

Companies that integrate creativity, analytics, and purpose are delivering at least two times the growth of their peers (Biljana Cvetanovski et al., 2021). As digital marketing analytics needs to bridge the two complex areas, data itself and making insightful reports for decision-making, the internal capacities and creative approaches teams use to connect the two areas represent a crucial role in this process. The process of data analytics interpretation depends on the team or individual capacity to analyze, understand, innovate, and creatively turn data into insights. Creativity can also help teams generate hypotheses about what the data means and what actions can be made based on the uncovered insights and trends. However, the connection between start-ups (of different maturity levels) and enabling the practices of boosting creativity, remains a subject yet

to be explored. With this proposition, the goal is to determine what kind of methods are used by teams to develop and boost their creativity in data-driven environments. This proposition will also be tested through the DM_Optima Framework application (as one of the subcomponents of the framework) in nine case studies and their cross-case analysis.

1.7. Research Strategy

In order to address the research problem and questions, two phases of the research strategy will be conducted (Figure 1.2.). The first phase starts with the notion of developing conceptual mapping through a systematic literature review, which helped the researcher to gain an understanding of the existing knowledge, gaps, and research connecting digital marketing and start-up growth. The conceptual mapping is used to identify the key concepts and components of how digital marketing helps start-ups to grow. This kind of conceptual mapping served as the foundation for developing a Macro-dynamic framework, as the first output of this thesis. As a Macro-dynamic framework was made to encompass growth drivers impacting key start-up activities through digital marketing, this framework also served as a funnel to focus on product-market fit as one of the key points of start-up success.

The second phase of the research strategy focused on investigating the relationship between the product-market fit and start-ups in the context of digital marketing. Product-market fit is a recent phenomenon whose establishment varies from start-up to start-up and is recognized as a rather fluid concept. Given the mentioned points, case study research was used to investigate how digital marketing can support product-market fit through performance measurement as an integral part of understanding and achieving the product-market fit.

Even though case study research is identified as one of the most challenging of all social sciences research efforts (Yin., 2014), it's found to be appropriate for this type of research as a researcher "seeks to answer "how" or "why" questions, "has little control over behavior" and is "focused on a contemporary phenomenon" (Yin., 2014). This work fits all three conditions as start-ups, product-market fit, and digital marketing performance measurement as concepts are

contemporary and growing market phenomena, in need of further interconnected understanding through empirical research. Moreover, (Meredith, 1998) defines case studies as a "research strategy that typically uses multiple methods and tools for data collection from a number of entities by a direct observer(s) in a natural setting, but without experimental controls or manipulations". This research was designed to understand real-world contextual factors and how decision-making is done by connecting product-market fit, start-ups, and performance measurement processes. Thus, this research will use multiple case studies as a research method.

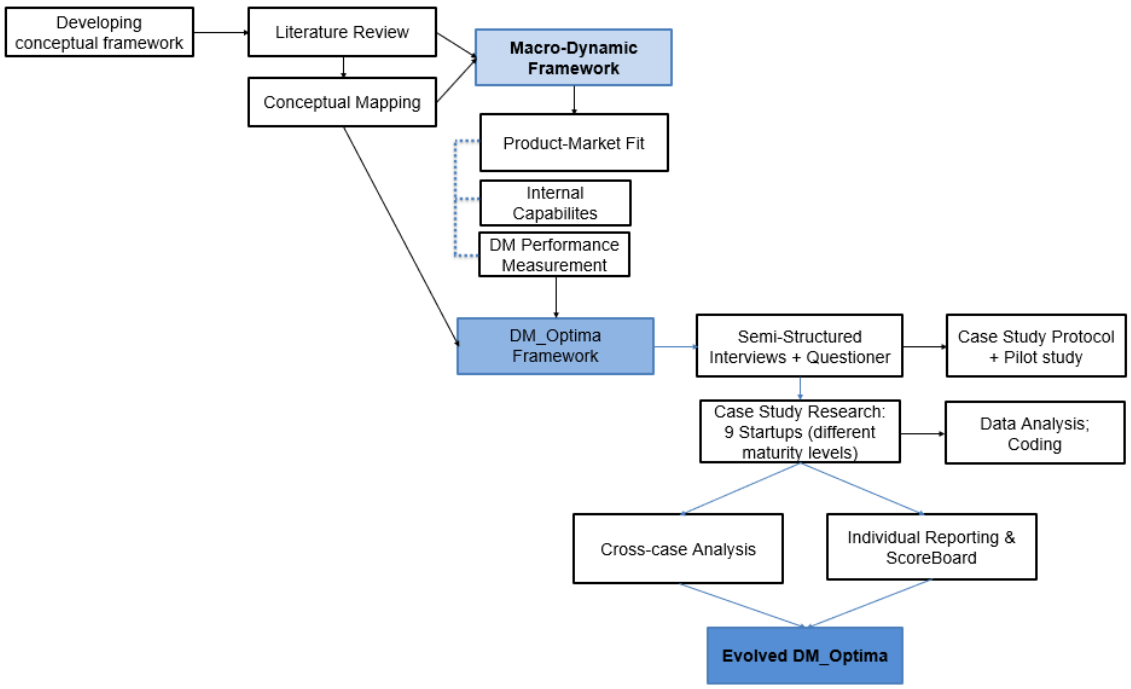


Figure 1.2. Research Strategy

To investigate how start-ups can use digital marketing in product-market and performance measurement, the DM_Optima framework was designed. The framework is conceptualized and made on the bases of gathered insights from the current state of the art. In order to test the applicability of DM_Optima, multiple case study research with nine start-ups was made. As established through the literature review, start-up maturity plays a major role in defining the experimentation process of product-market fit through digital marketing, and for this reason, start-ups of different maturity levels were chosen to participate. The research was conducted by collecting data through semi-structured interviews, Questionnaire, and secondary data on start-

ups involved in the study. The Questionnaire was used to collect demographic information on start-ups and inputs on several process points of product-market fit, data analytics, and internal capacities (the questionnaire can be found in the appendix).

To reach a holistic and in-depth understanding of the product-market fit in this case study research, two aspects of findings have been made. Firstly, each case study was analyzed individually and product-market fit activities were matched with the usage of digital marketing. This steps will also uncover how digital marketing impacts start-ups in different contexts (including maturity levels). The second individual result is the tested applicability of the DM_Optima Framework which identifies start-up's digital marketing performance measurement linked with product-market fit. The framework is presented in a Scorecard. The Scorecard as a method of performance analysis was used to identify levels of development for four different components of the DM_Optima framework – Digital experimentation, Digital Marketing Analytics Alignment, Data Interpretation, and Internal capacities & Culture.

After each start-up's reporting and results interpretation, the cross-case analysis was done. Based on the inputs of individual reporting and cross-case analyses, the first version of the framework applicability was updated in the evolved framework DM_Optima. The case study research resulted in findings that can further be used to test how developing an environment of digital marketing performance measurement can support start-ups in establishing and maintaining their product-market fit.

1.8. Thesis Structure

In the first chapter of the thesis, the introduction to digital marketing, start-ups, and joint growth possibilities including product-market fit and performance measurement is discussed. This chapter also describes the research purpose, questions, and propositions. The Literature review is done in the second, third, and fourth chapters in which all contextual subjects from the current body of knowledge are synthesized. Start-ups, digital marketing, growth potential, and challenges are presented in the second chapter. Product-market fit, as a concept and set of

activities, is described in the third chapter. The uniqueness of product-market fit for start-ups and the connection to digital experimentation through digital marketing is investigated in this chapter as well. Continuing with digital experimentation and digital interaction measurement, the fourth chapter discusses how interaction in a digital marketing environment can be tracked and measured, along with necessary internal team capacities and culture. Digital marketing analytics as the consequential output of the interactions are also discussed, followed by product-market fit interlinked with digital performance measurement. The discussion in this chapter continues with other areas of digital marketing performance measurement and its beneficial aspects for start-ups. This chapter also discuses the limitations of digital marketing usage for product-market fit, and the non-digital activities which are also crucial in this process. The last part of this chapter summarises all the research gaps connecting start-ups, product-market fit, and digital marketing performance measurement areas.

In the fifth chapter, the key components for designing the DM_Optima framework are presented. Firstly, the summarisation of the literature review served to encompass digital marketing influence on start-up growth (including product-market fit and measurement possibilities), into a Macro-Dynamic framework for start-up growth drivers. Secondly, the learnings gathered around product-market fit and experimentations were applied to design parts of the DM_Optima framework, along with Internal capacities and Culture as complementary growth drivers. Digital marketing performance measurement and its key connections are also presented. Based on the gathered literature, the DM_Optima framework is presented with each component described. The logic of framework design and its adoption in the context of start-up performance measurement is also described.

In the sixth chapter, the multiple case study research methodology is presented. The chapter starts with a description of the overall points of developing this multiple case study research. From research design to data analysis, all activities of the case study implementation have been outlined.

The seventh chapter presents the research analysis of nine case studies and the findings. The analysis was done for each case study individually, and secondly, a cross-case study analysis was

concluded. In both types of analyses, how digital marketing supports start-ups in their ability to optimize the product-market fit is discussed. As a final point, after the case study analysis and results, the evolved framework – DM_Optima is presented, along with the comparisons between the two frameworks (the first one before, and the evolved one after the case studies). Based on the comparisons and changes, the adapted and added components of the first framework version are integrated into the evolved DM_Optima framework.

Lastly, in the eighth chapter, the conclusions, limitations, and notions on future perspectives and developments of this thesis are discussed.

2. START-UPS & DIGITAL MARKETING

The literature review was made in line with the defined problem areas of this work. As the problem area involves several main subjects linked to start-up growth, the literature timeline is presented connecting the main developments of start-ups, digital marketing, product-market fit & digital marketing performance measurement (Figure 2.1.). Firstly, start-ups and their growth through different aspects are explored. Afterward, the digital marketing influence on start-ups along with digital marketing strategies used by start-ups, as well as challenges and opportunities connecting start-ups and digital marketing are investigated. The key activities and areas influenced by digital marketing are also investigated and summarised.

Secondly, product-market fit as a separate growth driver for start-ups is researched (including the process of digital experimentation, testing, strategies, and gaps). Lastly, digital marketing performance measurement is investigated along with its connection to start-ups, experimentation through digital marketing channels in support of product-market fit, and digital marketing analytics.

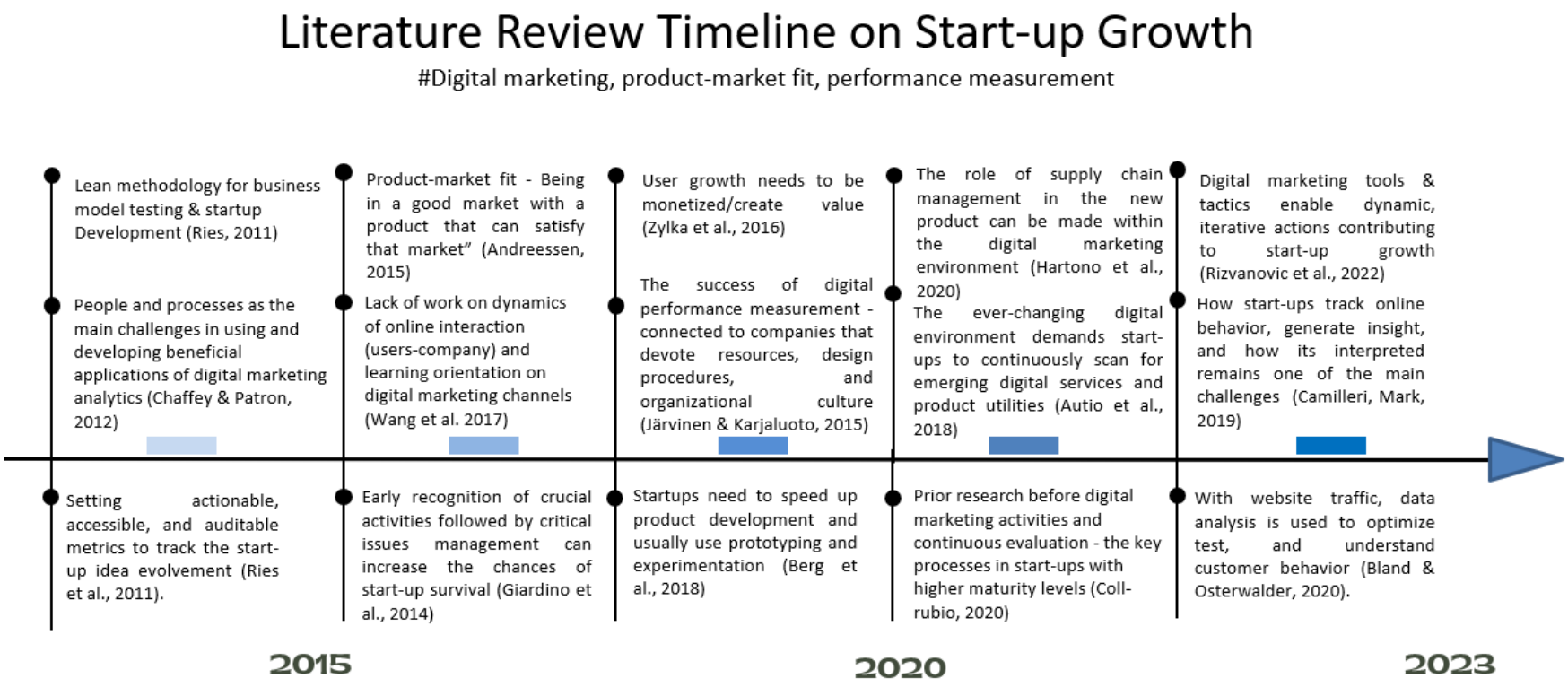


Figure 2.1. Literature Review Timeline (authors elaboration)

2.1. Start-ups

A start-up is an early-stage venture in search of a profitable business model which can be rapidly scaled (TW. Melani, 2018), operating in hyper-competitive environments. As an entity, a start-up represents a reactive and rapidly evolving company working under uncertainty, time pressure, and a lack of resources (Nguyen-Duc et al., 2021). A start-up's lifespan depends on its industry context, operations, founders' vision, investments, and how the exit is made. From an overall point of view, an entity is considered a technological start-up for up to seven years to ten years (Wasim Jabbar, 2022). Bases of start-up product development are discovering the customer's "pains" and leveraging them with their product offerings which offer "gains" or benefits to the customers (Bland and Osterwalder, 2020). The end goal is to make a product satisfying the customer's needs, and have a lasting connection with the customer base. Start-ups need to speed up the product development process and usually use processes of prototyping and experimentation to validate their assumptions and collect customer feedback (Berg et al., 2018). In this process, start-up teams are confronted with managing several different activities at once. Start-up key activities are primarily focused on activities leading to launching the (innovative) product, promoting the product, building up strategic alliances, and the need to balance and coordinate their functioning activities (Besker et al., 2018). Innovative products are usually the prerequisite for start-up growth. Start-ups and innovation are often connected through the experimentation process, where a start-up tests its hypotheses and assumptions through rapid iteration and data-driven decision-making.

To innovate, adapt and launch products rapidly, start-ups depend on team members and resources dedicated to different aspects of the operational process. Their adaptability in large depends on the team's capabilities, and what kind of practices and strategies the team is maneuvering to boost growth.

2.2. Start-up Growth & Innovation Approaches

The appearance of new technologies has created a business ecosystem in which start-ups can easily develop and test their business models. Furthermore, open and collaborative processes through digital media reduce the reliance only on in-house resources and open up the innovation venue with customer cocreation through social media (Hitchen et al., 2017). Innovation in early-stage digital start-ups is made within two complementary paths (Ghezzi and Cavallo, 2020):

- innovation needed to adjust and adapt their products, services, and value proposition to changing internal and/or market conditions - and mostly refers to the process of New Product Development (NPD),
- innovation to their business model - the overall changes in the business model and process generating value for target customers to ensure economic and financial viability.

With the first path start-ups usually utilize Agile methods to develop their products, service, and value proposition. Agile practices include requirements discovery and solution improvement through the collaborative effort of self-organizing and cross-functional teams with their customers (Collier, Ken W., 2011). Within the second path, start-ups use Lean Approaches as a method to support founders in the validation and innovation of their business models. Both approaches have been frequently used by practitioners with a differentiation that the Lean start-up approach focuses on overall solution improvement by creating minimal viable products and testing them with customers, while agile is both a methodology for making and scaling solutions with fast and incremental releases (Chrissy Kidd and Jonathan Johnson, 2020).

As this work objective is to discover the way how digital marketing helps start-ups impact the overall process of solutions improvements, the work will identify parts of both approaches (given the context) but will be more connected towards lean methodology and its application in the digital marketing environment.

2.3. Start-ups & Lean methodology

The lean start-up methodology is used to discover innovation, functionalities, and improvement in the fast-changing market environment start-ups operate (Ries, 2011). Within the lean methodology, the build-measure-learn loop is used in the start-up's value proposition (Ries, 2011). A value proposition refers to the collection of products and services that create value for a specific customer segment (Bland and Osterwalder, 2020). The feedback loop can be implemented in integrations with online - offline channels and methods to collect feedback and learnings mainly from customers, including other start-up stakeholders. The base of this methodology is the constant experimentation process enabling start-ups to gather insights on customer needs and test their value proposition in line with gathered learnings from the market.

In the experimentation process, identifying assumptions is the first step. Validating business assumptions lead to discoveries on product, and market, and consequently, business models start-up will develop (Gutbrod et al., 2018). A hypothesis is a proposed explanation or prediction about a specific aspect, while an assumption is a belief or estimate made about a situation or condition that is taken to be true without proof. Making hypotheses and assumptions can be seen as the first point of the start-up's potential growth, and to manage this risk, assumptions should be tested. Assumptions need to be transformed into testable hypotheses. As not all aspects can be tested at first, teams need to prioritize the assumptions in a way that they can identify the non-important and dangerous ones, test the dangerous ones, learn from results, validate, and iterate. This process will help to avoid proceeding based on wrong assumptions (e.g., implementing features nobody needs) (Gutbrod et al., 2018). The Lean Start-up approach is anchored in experimentation (Ries, 2011), in which hypotheses are tested through (business) experiments (Bland and Osterwalder, 2020). An experiment is a procedure carried out to test a hypothesis (support, prove or validate). Each experiment should generate evidence and insights to learn and decide (Bland and Osterwalder, 2020). The testing can be done with many techniques, from paper-prototype to surveys. Thus, digital marketing, with its channels, strategies, and tactics,

defines a *digital playground* for running and designing experiments to test and gather insights on start-up products or markets.

2.4. Start-ups & Digital Marketing Ecosystem

Digital marketing can be identified as one of the fastest-growing components in practical usage for different business aspects. Having low investment techniques and tools (Kuester et al., 2018) sets digital marketing usage in start-ups as a practical and strategic solution covering many challenging processes of stabilization and growth. The digital marketing ecosystem is a multifaceted landscape that encompasses a wide array of interconnected components and strategies. It includes online advertising methods such as pay-per-click ads and social media promotions, content marketing engaging audiences with valuable content, and email marketing campaigns to reach subscribers with tailored messages. Search engine optimization is crucial for improving visibility in search engine results, while analytics tools and marketing automation streamline data analysis and repetitive tasks. E-commerce plays a key role in selling products and services, and affiliate marketing leverages partners to expand the initial reach. Mobile marketing targets users on their devices, influencer collaborations provide social credibility, and customer relationship management systems help manage customer data for enhanced interactions. Web design and development create user-friendly websites, and data privacy and compliance considerations are essential.

Following these developments, start-ups are using digital marketing strategies and data received from the platforms, smart data, to drive their decision-making to different key activities. A digital marketing strategy is a planned activity outlining the objectives, target audience, messaging, and key performance indicators (KPIs) of certain digital marketing efforts. Digital marketing strategies provide a roadmap of tactics, which are specific activities in line with the strategy to reach the identified objective.

The extended impact of digital marketing can have a substantially higher role in start-up growth and different contexts. With the extended impact, it is referred to the role of digital marketing (and its ecosystem) directly influencing start-up growth in different areas and activities such as

customer relationship building and communication activities (Silva et al., 2020), experimentation and testing (Bland and Osterwalder, 2020), and customer co-creation enablement (Kim et al., 2021). In the early stages, start-ups have the role to educate, reduce uncertainty and build trust within their ecosystem, and these aspects can also be influenced by digital marketing strategies. Connecting to supply chain management, digital marketing has also a macro dynamic role as it can influence the supply chain process (Hartono et al., 2020) with its communication and customer service options integrated with social media platforms. One of the most used benefits of digital marketing is that its interactive tools enable start-ups to test the value proposition, at any maturity level. Furthermore, it outlines the need of having complex processes narrowed simply and understandably (Standing and Mattsson, 2016), which accelerates the enrichment of the customer journey by using data analytics and acts as a link of sustainable and transparent communication with stakeholders. From the organizational aspect, social media can be utilized as a strong element of social-client relationship management (S-CRM), in which combined marketing and information insights can lead to enhanced customer engagements and services (Harrigan et al., 2020). With all the impact possibilities, strategic use of digital marketing channels & strategies can make a shift in start-up growth and lead to higher maturity levels in different start-up growth components.

2.5. Start-up Digital Marketing Challenges

Challenges and problems start-ups face during different maturity stages can serve as a recognition point of which business areas digital marketing specifies its support through the extended impact. The fuzzy knowledge of key business components and technology, while underestimating the needs in marketing and brand mark one of the first challenges start-ups have (Standing and Mattsson, 2016). Time dedicated towards product and technology development can overtake setting a hypothesis, defining the value proposition, and building customer relationships, especially if a start-up focuses only on technical aspects (Kuester et al., 2018).

The ever-changing digital environment demands start-ups to continuously scan for emerging digital services and product utilities (Autio et al., 2018), and quickly react - upgrade or change their value offering (Ghezzi, 2020). This puts start-ups in a position to build on continuous testing and matching customer needs, not only as a product-based but also as a competitive advantage activity.

Table 2.1. Start-up challenges connected to digital marketing potentials of influence & product area (authors elaboration)

Start-up Challenge	Source	Area	Digital Marketing (DM) Extended potentials of Impact
Technology Uncertainty	(Giardino et al., 2015)	Product	Customer Education; User Testing
Defining Minimum Viable Product / Product Market Fit	(Nguyen-duc, 2020)		Identifying Product and market potentials
Product mistiming	(Akter and Iqbal, 2020)		Market/Competition Research
Failure to Pivot	(Akter and Iqbal, 2020)		Product-market fit; Market/Competition Research
Unique Brand Identity	(Kim et al., 2021)		Brand building and Awareness (through DM channels and strategies)
R&D before the product launch	(Bekhradi, 2018)		Testing/Experimentation through DM tools; Market Research
Introducing new features; Identification of potential lacks clarity related to new features	(René Bohnsack and Meike Malena Liesner, 2019)		Publishing content on Product Features (Usability, Technology); Receiving Feedback; Customer Education (usability, benefits)
Transparent Communication;	(Kim et al., 2021)		Transparent content & communication
Consumer concerns about online privacy, data, fake news	(CIGI-Ipsos Global Survey, 2019)		Customer education on data privacy and security;
Fake online reviews; Misinformation distribution; negative eWOM	(Dwivedi et al., 2021)		Publishing verified information (on products, processes, financial & sustainability reports)
Decision-making involving market and technology aspects.	(Bekhradi, 2018)		Testing/Experimentation; Market Research Data

To identify the potentials of digital marketing impact on start-up challenges, four areas of impact are identified and connected with potentials of impact. To group challenges into complementary areas, the categorization was done in line with (Macmillan, 1987) dimensions corresponding to product, market, team, and finance areas. Starting with Product Area, Table 2.1. identifies different challenges start-ups have, along with possible connections to the start-up challenges connected to the Digital Marketing Potential of Influence. The presented start-up challenges become operational points that can be influenced by digital marketing activities and, secondly, can represent components for further start-up growth. Recognizing the drivers, values, and motivations of the customers will help to understand and overcome obstacles towards acquiring the targeted consumers (Lehnert et al., 2019). The faster the value is recognized as one of the core start-up development needs, the start-up establishment process will thrive. In this setting, digital marketing channels and strategies are bridging the lack of start-up's unfamiliar presence and can form a sustainable connection between start-ups and customers.

Continuing the potential of influence from the Market side, Table 2.2. identifies different challenges start-ups have, and optional support through digital market channels. Early recognition of crucial activities followed by critical issues management can increase the chances of start-up survival (Giardino et al., 2014). Signs of unfriendly products (Akter and Iqbal, 2020), could be recognized through testing and experimentation on digital channels (along with UX design) on which the non-functioning or unfriendly product feature could be mitigated.

Table 2.2. Start-up challenges connected to digital marketing potentials of influence & market area (authors elaboration) (1/2)

Start-up Challenge	Source	Area	Digital Marketing (DM) Extended potentials of Impact
Acquiring First Paying Customers;	(Giardino et al., 2015)	Market	Generating Leads through DM Channels - Sales; Customer Engagement & Retention techniques
User Unfriendly product, Ignoring customers	(Akter and Iqbal, 2020)		Customer Education; Testing /Experimentation (feedback collection); Product Feature Content (usability)

Table 2.2. Continued (2/2)

Start-up Challenge	Source	Area	Digital Marketing (DM) Extended potentials of Impact
Customer retention	(Conway and Hemphill, 2019)	Market	Customer Engagement, Retention &Support;
Little user knowhow	(Pedro Marins Freire Teberga, 2017)		Testing/Experimentation; Insights from Product-Market Fit; Customer Education
Targeting a Niche Market	(Giardino et al., 2015)		Market Research (on customers, products, competition, trends); Testing/Experimentation DM options; Insights from Product-Market Fit;
Customer persona	(Lehnert et al., 2020)		Market Research (on customers, products, competition, trends); Testing/Experimentation DM options
Credibility and trust	(Kuester et al., 2018)		Customer education & Support, transparent activities, and partnership development.
Almost non-existent brand image;	(Marins, Teberga and Oliva, 2017)		Brand building and awareness; Customer education on brand: Partnering with complementary brands
Delivering Customer Value	(Giardino et al., 2015)		Product-Market Fit; Supply chain management and customer services; Simplicity in defining and delivering value
Lack of Marketing and Sales Strategies; Lack of Internet Marketing Strategy and Social Media Presence	(Akter and Iqbal, 2020) (Marins et al., 2017)		Generating Leads; Customer Engagement & Retention techniques; Brand building and Awareness
Start-up Success factors: Accurate Market Feedback, Defining the Right Market	(Bormans et al., 2020)		Market Research (on customers, products, competition, trends); Product-Market Fit;

Continuing with influence within Team Area (Table 2.3.), as start-ups struggle with attracting the right talent and building entrepreneurial teams (Oliva et al., 2019), recruiting through DM channels can support this challenge.

Table 2.3. Start-up challenges connected to digital marketing potentials of influence & team area (authors elaboration)

Start-up Challenge	Source	Area	Digital Marketing (DM) Extended potentials of Impact
Lack of Resources; Building Entrepreneurial Teams	(Giardino et al., 2015) (Oliva et al., 2019)	Team	Team contributions to content development; Recruiting through DM Channels (viral effect); Data analytics as a resource
Supply chain management	(Hartono et al., 2020)		Customer education & Support; Simplicity in the supply-delivery process
An excessive number of requests on social media to salespeople	(Dwivedi et al., 2021)		Planned customer support through DM Channels;
Resistance to documentation; Short Delivery; Pressure for results in a short period	(Oliva et al., 2019)		Using data analytics provided by digital platforms as inputs for internal planning and strategy delivery
Usage, value, risk, and psychological barrier	(Chakraborti et al., 2022)		Team contributions to content development

Furthermore, start-ups also have an excessive number of requests on social media to the sales department (Dwivedi et al., 2021), mitigating this activity through planned customer support through DM channels can be designed.

Concerning the Financial area (Table 2.4.) digital marketing can provide support in raising investor awareness by publishing different content (e.g. start-up industry news, recruitment, product information, leadership articles, etc.). The same activity can be used to raise funds and have an authentic, secure way of proving the process and including blockchain with this strategy (Saji et al., 2019).

Matching the challenges with opportunities leverages the risk of failure. In this perspective, identifying challenges linked to digital marketing opus of impact becomes an important point of start-up growth.

Table 2.4. Start-up challenges connected to digital marketing potentials of influence & finance area (authors elaboration)

Start-up Challenge	Source	Area	Digital Marketing (DM) Extended potentials of Impact
Acquiring Initial Funding;	(Giardino et al., 2015)	Finance	Raising Investor awareness by publishing different content (start-up industry news, recruitment, product information, leadership articles, etc.)
Matching funding, investors, and start-ups with blockchain	(Saji et al., 2019)		Raising funds, secured and transparent with digital and blockchain strategy
Poor Creativity with Funding	(Akter and Iqbal, 2020)		Low investment techniques and strategies for a targeted audience

Mapping out the possible impact areas of digital marketing for start-ups makes the bridge between challenges and the evolvement of extended digital marketing opportunities for start-up growth, as presented in different key activities.

2.6. Analysis of digital marketing frameworks & strategies used by start-ups

When designing a digital marketing strategy, (Dave Chaffey, 2017) starts from objectives, and with the questions "Why do you want to go online, what are the objectives, benefits, and advantages". Although digital marketing is usually perceived as a function of marketing and sales, its extended impact can have a substantially higher role in start-up growth. Digital marketing options represent a crucial contemporary marketing tool for start-up promotion (Svetlana, 2018).

Before each digital strategy launch, setting the right goals is a precondition. (Kaur and Kumar, 2020) in their research present that without a systematic approach towards digital marketing, the impact is limited. To formulate a digital strategy (A Safanta et al, 2019) used the SOSTAC framework accompanied by SMART and RACE framework for goals formulation and SWOT

analysis. The SWOT analysis, as one the most used method of analysis, is used for identifying and analyzing internal strengths and weaknesses, and external opportunities and threats. The SOSTAC framework is a marketing planning model used to identify the current and future market position of a company through the following six steps: situation analysis, objectives, strategy, tactics, actions, and control (Chaffey, 2022a). The SMART framework is used for setting clear, attainable goals in project management (SMART), while the RACE framework helps to design online marketing activities supporting companies to engage with customers throughout the customer lifecycle (Chaffey, 2022b). The mentioned frameworks were used as leading frameworks in digital strategy formulation (A Safanta et al, 2019) to set goals, understand the market, competition, and internal capacities as a base formulation. After setting the formulation, digital marketing targets, strategies and tactics were made along with SWOT analysis insights. Continuing with the same line of methodology (Muhammad, 2019) analyzed and provided insights on potential information technology-based marketing strategies, used by a start-up in the tourism sector adapting the SOSTAC and RACE planning framework. The results crafted strategies and tactics which included analytical tools to reinforce the main framework basis. In the context of mobile commerce (Iru et al., 2017) also used the SOSTAC framework to deliver a set of recommendations – digital marketing strategies and tactics for a digital start-up. While forming growth hacking strategies, the RACE framework was also used in (Coll-rubio, 2020) as a main framework leading to short-term marketing goals. Moreover, the same authors identify having prior research done before starting with digital marketing activities and continuous evaluation (in line with RACE methodology) are the key processes in the public relations actions used by start-ups with higher maturity levels. Thus, the first step of digital marketing strategy is usually designed through several frameworks which enable start-ups to research and understand (internal and external) needs and opportunities.

Different start-up maturity levels imply the design of strategies corresponding to their current resources. According to (Kuester et al., 2018), in the early stages, start-ups use a social, customer-centric promotion approach due to financial limitations. The mix usually includes social media (providing customer referrals by engagement in positive word-of-mouth), content on the website

(blogs press), customer testimonials, merchandising, and videos – all low-investment techniques. The usage of low-investment techniques needs prior customer research to have an audience-channel fit which will naturally lead to the utilization of the fitting channels (as the concept of lean start-up develops on prior customer discovery). A key finding was the issue of not overinvesting in technical solutions upfront, but rather developing solutions to a workable level and building the user group (Kuester et al., 2018).

In their research (Svetlana, 2018) suggest a marketing tool for assessing the sustainable development of a start-up by stages, with the defined criteria. The tool presents profiles of the optimal criteria values that are unique for each stage of the start-up life cycle from the marketing perspective. The start-up cycles are presented through four stages, concept, test, working-out, and launch. The study implies the number of marketing instruments rises as start-ups enter a new stage, directly emphasizing the role and importance of strategic marketing implementation. Furthermore, (Koch, 2015) indicates scarcity and personalization can be used to activate promotional feedback campaigns of new IT start-ups when collecting user feedback on pricing, value proposition, and product-market fit.

In line with the existing resources of a start-up (time, staff), planned execution and invested time in digital marketing strategy should be seen as a concept of business development. Nevertheless, if not properly managed (with specifically allocated working hours) the digital marketing impact won't be optimal (Hartono et al., 2020) and will require additional team resources to reach complete efficiency. A dynamic content strategy by (Chen et al., 2017) presents how regularly disseminating information on product development, new industry trends, job recruitment successfully impacts start-up on team recruitment and brand awareness.

From the perspective of supply management with new products on the market, having a responsive service and attractive content on social media implemented by prepared teams can positively impact customer service (Hartono et al., 2020). Crowdfunding is also implemented as a strategy by using the wisdom of the crowd to connect solutions and customers while using

limited team resources. Prototyping the product, building customer relationships with feedback collection, and community building through social media drives start-ups toward higher user engagement and product-market with right-on-time transparent communication (Li et al., 2016).

Therefore, the indicated research suggests that start-ups implement digital marketing strategies and tactics to influence growth in several key activities. With utilisations of pre-designed frameworks (e.g. SOSTAC, RACE, SWOT) start-ups try to understand and track the results of the strategies and implemented tactics, depending on the start-up maturity levels and try to design strategies that can simultaneously influence a number of key activities.

2.7. Start-up growth and maturity levels

For early-stage start-ups, several uncertainties occur especially concerning customers and how to reach the first, early adopters. It's important to create the customer persona and understand the pains, needs, motivations, and emotions of the targeted audience (Lehnert et al., 2019). In this stage, a start-up reputation is not yet developed, and generating awareness with different brand co-building strategies can be introduced (Chen et al., 2017).

To encompass start-up challenges, maturity levels, and potential influence on growth from digital marketing, within Table 2.5., the start-up maturity levels and digital marketing potentials of influence are presented. Start-up maturity levels have been based on the model for the evolution of product development (Crowne, 2002), along with key processes for maturity levels by (Besker et al., 2018). The challenge start-ups have from R&D before the product launch is to target the most promising market (with adequate maturity level) and reduce waste (Bekhradi, 2018). Different market research techniques can be done through digital marketing channels supporting start-ups in the understanding of the market (trends), targeting customers and their needs (testing process, cohort analysis). Therefore, first maturity actions should be made by a simple strategy of fast iterative experimental approach, small scales, and simple logistics process (Standing and Mattsson, 2016).

Table 2.5. Start-up Maturity Levels and Digital Marketing Growth Potentials (authors' elaboration)

Start-up Maturity Levels	Early-stage 1st level	Stabilization 2nd Level	Scale-up 3rd Level	Maturity 4th Level
Key level processes	**First product release First Customers First Revenues**	**Additional key features Additional customers**	**Specialization and coordination**	**Expansion/ extension (build vs. buy)**
Resources	Lack of time, personal, funds; Focus on technical functions Strategically non-aligned	Short-term funds available, in search of new investments or higher sales Team roles need to be strategically defined Main KPIs identified Resources not yet in line (HR, Strategic alignment)	Attracting new investment Team Roles defined. Targeted hiring, improving quality and implementing processes*	Targeted hiring, improving quality and implementing processes* Experienced team and leadership in place Resources functionally aligned
Maturity Level Challenges	Defining value proposition, first sales, discovering market and customer database/community, Lack of Knowledge diffusion and regular practices Lack of strategic plan of product development	Product is still not finalized Customer base is still growing Team is not yet complete Work practices are being defined Business objectives are being planned, and implemented with milestones and KPIs Marketing and sales are getting set with clear objectives and measurements	Business processes getting refined. Growing into stable innovative-working culture (attracting the best talent)	Decision-making connected to growth (new markets, customers, industries)
Digital Marketing Challenges	Lack of dedicated staff/team or resources dedicated to digital marketing Lack of market and customer understanding Lack of customized messaging towards customers (trust, reducing uncertainty, etc.) Lack of (or basic) marketing planning Limited (or no) data analytics use from DM Channels	Marketing role defined in a start-up team Audience-Channel fit Corresponding Objectives and measures identification (leads and conversion known) Need for higher brand awareness and customized content marketing Digital marketing actively supports other business processes	The start-up is in process of having or has a dedicated inhouse team that generates new ideas, design campaigns and executes them and/or outsources parts of process. Smart data obtained from DM converted into insights for decision-making.	Full alignment between data, marketing, sales, and other sections. Creating relevant content, campaigns, and activities in all types of formats, channels to position/remain as a market leader/ enter new markets
Digital Marketing Extended Potentials of Impact	Product-Market Fit Sales & Lead Generation* Market Research Customer Education & Support Communication, Engagement, and Retention Online Community Building Brand Building &Promotion* Testing & Analytics * Partnership development Raising Investor Awareness	Sales & Lead Generation* Product Features Optimization Testing & Analytics* Brand Building &Promotion* Transparency Online Community Building Internal Process Development Partnership development Customer Education & Support* Engagement and Retention*	Product Features Optimization Sales & Lead Generation* Product-Market Fit (new products/markets) Testing & Analytics* Cultivating long-term relationships* Transparency Culture building and talent search Raising Investor Awareness	Internal Process Development (Complete data optimization) Cultivating long-term relationships* Culture building and talent search Product-Market Fit (new products/markets) Brand Building &Promotion* Sales & Lead Generation* Communication, Engagement, and Retention

Continuing with the start-up market perspective, the discovery and knowledge gap exists in market and customer understanding, along with reducing uncertainty (Kuester et al., 2018). Lack of marketing and sales strategies, internet marketing strategy, and good social media presence was identified by (Akter and Iqbal, 2020) as points for further development in the early stages. If we consider a minimal viable product (MVP) as a creative and engineering process relying heavily on the context in which it's being designed (Nguyen-duc, 2020), the digital marketing

strategies used to test the MVP (e.g. landing page) need to correspond the context, target audience and resources start-up has to implement the strategies.

The use of data optimization, defining business, and marketing processes start to happen in the next start-up maturity stage, Scale-up. When a company is in a position to scale into new markets or extend its impact towards new customers it has reached a stage of maturity. In the case of Zomato (Raman and Raman, 2018), reaching this stage required investment in talent and business activities while implementing niche strategies (with different revenue streams) for entering the new markets. Other than challenges connected to internationalization and new market entries, creating a long-term relationship with creative and high-quality content, remains a crucial point in customer experience design at this stage. Designing attractive content, campaigns, and activities in all types of formats and channels needs to be done to be positioned/remain a market leader.

2.8. Digital marketing metrics for start-ups

Metrics, setting them to be actionable, accessible, and auditable, characterize a starting point for tracking start-up idea evolvement (Ries et al., 2011). When defining the marketing metrics of start-ups, (Rajagopal and Davila, 2020) outline domains of organizational design, marketing strategies, customer-centric approach, and transactional domain. Performance metrics included the variables and subdomains of customer acquisition, behavior segments, pricing along with distribution and represent the holistic view of the organizational efforts of tracking start-ups by performance metrics from a marketing perspective. Looking at the operational start-up metrics (Rompho, 2017) grouped the performance metrics depending on the type of start-up and divided the metrics into six groups: e-commerce, SaaS, Mobile App, Media site, User-generated content, and Two-sided marketplace. To get traction and upstream the business development, in the Traction framework (Zaheer et al., 2019b) key performance metrics are defined through user growth, gross profit margins, and sales conversion ratios. From the tech start-up perspective, (Prikladnicki and Wang, 2020) compile a list of 118 metrics, forming the following groups of

metrics: software engineering, business & financial, user & customer, and ending with social media. Metrics are supposed to be crafted and used for informing on the present situation and have one of the key decision-making roles.

2.9. Emerging technologies

Emerging technologies are enriching the digital marketing ecosystem, and changing the outlook of how marketing is conceptualized and used in the customer journey. Start-ups can use emerging technologies through digital marketing to impact their growth by leveraging new tools and platforms to reach and engage with customers in new ways.

Machine learning enables companies to obtain large databases which can be used for the optimization of digital marketing channels. (Gupta et al., 2021) suggest that combining insights and big data analytics is used as a tool to identify opportunities in strategic decision-making on a company level. Blockchain has materialized as a form of trust and a decentralized way of securing ownership (Nodehi et al., 2022) while opening opportunities in marketing such as combating click fraud, loyalty programs, and vouching for trust & transparency (Rejeb et al., 2020). As Augment Reality (AR) typically interacts with other media and touchpoints, it needs to be well integrated with other media and marketing elements (Rauschnabel et al., 2022). Crosslinking the AR with digital marketing and creating journeys with multiple touchpoints seems to be the next step in synchronized marketing activities. It also exemplifies the emerging technologies position the marketing department towards having stronger strategic influence in the organization.

Furthermore, as suggested by (Jung and tom Dieck, 2017) the effective use of multiple technologies including AR contributes to the co-creation process (for example virtual tours connecting organizations and visitors in tourism), implying the symbiosis of emerging technologies will move marketing departments even closer to the development areas. As within AR, the customer journey is enriched with multiple touchpoints, marketing will inevitably play

a higher role in product/service development and the cocreation path of the interactive environments. With a rich amount of data gained through an interactive experience, marketers are already benefiting from some point of data analysis (through digital marketing platforms), and will need to continue adapting their digital strategy as the cross-link with emerging technologies is already becoming an important part of digital marketing strategies.

2.10. Performance Marketing

Performance marketing signifies a situation when online campaigns are paid by companies to advertising platforms for results achieved through the campaign, namely clicks or conversion (Laura Kloot, 2022). In this case, the digital interaction is measured and tracked based on the level of conversion made on previously set metrics, for the specific digital marketing channels. Metrics used in performance marketing are connected to the type of conversions and cost associated as CPC (Cost per click - price paid for every time a viewer clicks on an ad), CPA (cost per action, for example, number of signups, downloaded ebooks etc.), and LTV (Lifetime Value - estimates the expected spend of acquired customers based on their ongoing activity, using advanced methods like predictive analytics).

Depending on the type of digital marketing channels chosen to run a campaign, the performance marketing tactics and goals are set to boost start-up growth through higher conversion rates and visible return of investment on touchpoints through the customer journey.

2.11. Summary of digital marketing influence on Start-up growth

Based on the literature review, it can be established that digital marketing can be used to influence a number of start-up activities, from experimentation on new products (Bland and Osterwalder, 2020), to supply chain management (Hartono et al., 2020) and customer education (Ho et al., 2020). Start-ups use frameworks to plan their marketing efforts (ex. SOSTAC, RACE)

and prior to the campaign activities, market research (as an activity also done through digital marketing) points out as crucial (Coll-rubio, 2020).

Depending on maturity levels, potentials with digital marketing impact changes, but the constant need of having digital marketing an important point for decision-making seems persistent, as well as having higher levels of team skills able to transform data into insight for a more structured decision-making process.

3. PRODUCT-MARKET FIT

As famously defined by start-up founder Marc Andersen "product-market fit means being in a good market with a product that can satisfy that market" (Andreessen, 2015). Through a series of build-measure-learn iterations, the base function of product-market fit is to clearly identify the need that the customer base has, and design/test the solution which fits the need.

Product-market fit is a breakpoint when a product/service gains enough traction and is validated by the market, either by an early-stage start-up or an already established start-up launching new products. (Gupta et al., 2020b) propose the following three active processes are needed in defining the right product-market fit and start-ups value proposition:

- problem validation or exploration (initial exploration based on the observed problem customers have),
- problem-solution fit (mapping the services and product which might be an answer to the problem), and
- product-market fit, creating the first solutions based on the two previous processes.

In search of understanding the concept of product-market fit, product management expert Dan Olsen designed the Product-market fit Pyramid (Figure 3.1.). The Pyramid describes several stages on how to achieve the right fit.

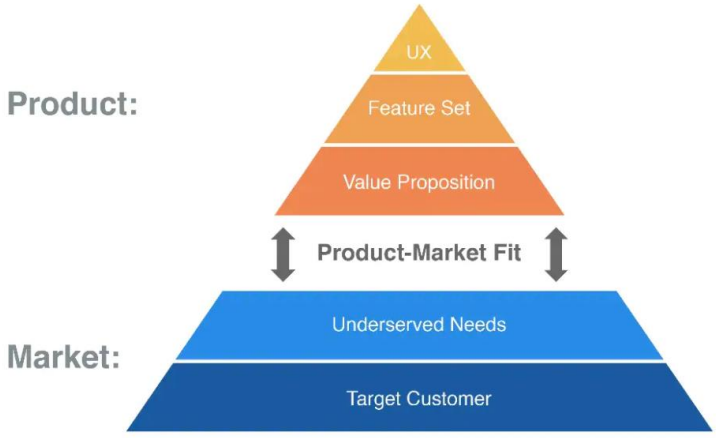


Figure 3.1. The product-market Fit Pyramid (Productized, 2017)

Starting with the market, the first questions which need to be addressed are about the customers – audiences (value & needs). Secondly, the start-up designs the product based on market insights and has three key elements (Value proposition, feature set, and design). Finally, when realizing an MVP to test the market, the emphasis is on usability (not perfection) and understanding how the whole process works with gathering intel from the customers.

3.1. Product-Market Fit Activities

In this process, some of the activities can be marked as pre-product-market fit or post-product market fit (Gupta et al., 2020b), depending on the type of the product/service, but in general perspective, product-market fit activities include:

- collecting inputs from the customer base (through interviews, surveys, and all kinds of research methodologies)
- market research on themes and trends similar to the product idea
- based on the inputs and insights collected (pains and gains) forming the value proposition¸
- designing working prototypes and minimal viable products,

- validating prototypes and MVP quantitatively (data analytics) and qualitatively (feedback in all forms) followed by selecting and prioritizing the most important features/pain points
- product validation (number of reported sales establishing the product-market fit has been acquired)

To fully understand what the customer truly needs and what a start-up can offer usually takes time. The product-market timeline represents the points in which the user at first recognizes there is value and starts to use the product, to the point of fully using the product/when the customer base starts to grow rapidly. In the pre-product market fit phase, the only mission of a start-up is to find a product-market fit (Lafleur, 2020). During this phase, user insights are crucial. The activities which gather insights bear high importance, followed by the process of how they will be used in further product development. This leads to another point that in the start-up's team, the resources and skills needed to effectively follow this process are also determining the success of the process.

In the product-market fit alignment, the iterative testing process and the feedback loops are critical. The learnings from the loops signalize customer insights and possible pivotal upgrades/changes on the products (Ries et al., 2011). Thus, elements driving the product-market fit include the MVP or the product designed to satisfy the customer through an experimental process (Melegati et al., 2020), feedback and the obtained data used correctly (Ries et al., 2011), established metrics leading to insights (Zaheer et al., 2019b) and the team skills to effectively use the information. In Figure 3.2., the activities and components leading to product-market fit are presented.

Throughout the customer journey, it's also essential to have feedback loops and get insights into how customers feel and use the product. In order to have the right message circulated to the right customer segment, audience-channel fit needs to be formed (Reto Felixa, Philipp A. Rauschnabelb, 2017).

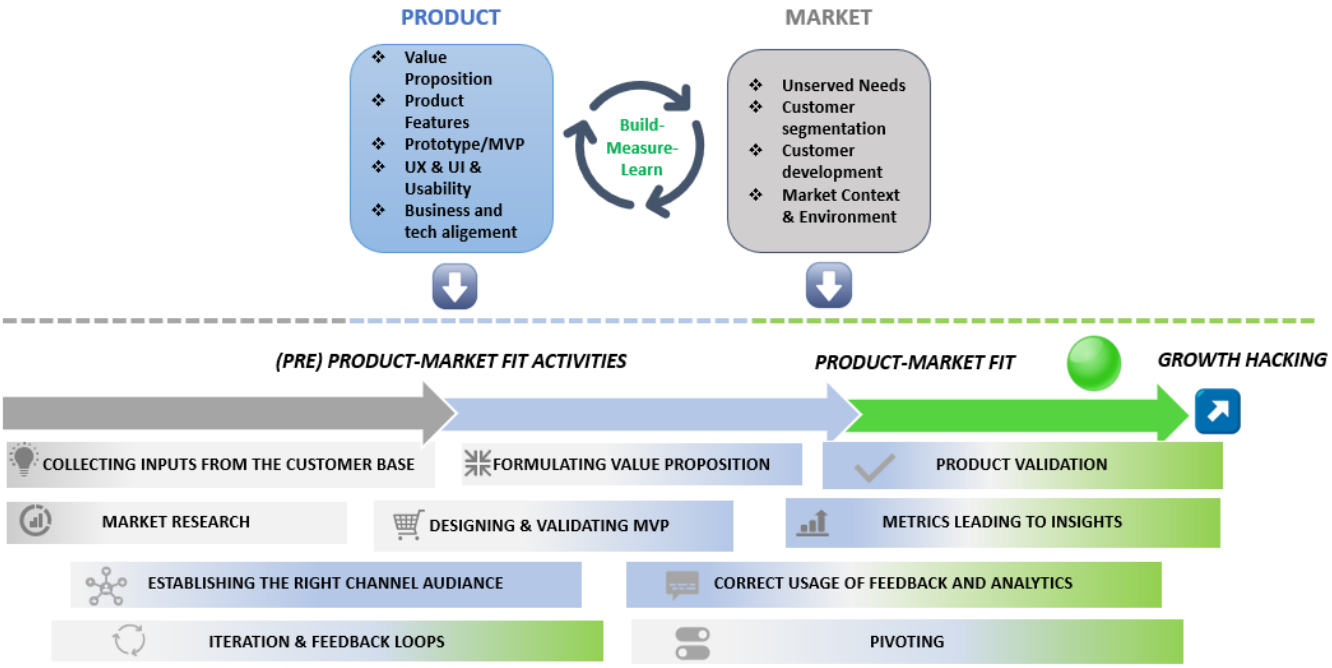


Figure 3.2. Product-market fit activities & components (author's elaboration)

In parallel, the business model is being tested and adapted based on the insights. The same process happens with technology in use, and both, value and technology should be aligned for the product-market fit. In this construction, the product-market fit process, along with the value proposition and testing process, serves as an input conductor for connecting the elements of new product developments, which can be tested and affirmed through digital marketing tools.

3.2. Connecting Product-Market Fit Activities & Digital Marketing Usage

The firm's innovative behavior is necessary for the development of dynamic capabilities which facilitate and enable service innovation (Kindström et al., 2013). With its components of continuous testing and learning throughout the organization (in line with lean principles), it can be implied that the model of product-market fit represents a system of dynamic components employed to reach the (product-market) Fit. Digital marketing, through its channels primarily serves to connect customers, the market, and other stakeholders with start-ups. Thus, digital

marketing represents one of the system's dynamic components, which can be used to support the Fit. Depending on the activity, digital marketing can affect several points of product-market fit development, from pre-activities to growth hacking. Digital analytics enable insightful testing processes through digital marketing strategies. In Figure 3.3, the list of potential digital marketing influences on activities leading to product-market fit is presented. The jobs which need to be done for each activity are identified, along with digital marketing options and corresponding metrics.

One of the main benefits for using digital marketing for product-market fit activities is its relative easiness of use, and the immediate applicability of the results, either in quantitative (through data analytics) or qualitative form (e.g. comments, user feedback, reviews). The usefulness of digital marketing can also depend on different start-up contexts and needs. The listed digital marketing options for supporting the product-market fit activities act as an instrument of discovery, validation and include jobs that need to be done with certain levels of team skills. For example, Search Trend Analysis as a digital marketing tactic can give insights into the current market outlook, how the solutions are presented, and collect inputs from the customers. With website traffic, data analysis is used to test, optimize and understand customer behavior (Bland & Osterwalder, 2020).

These and similar tactics can support start-ups to collect customer/ market inputs and have baselines to define the first hypothesis and market discoveries. Landing pages can be used to test the MVP, and influence lead generation while answering the question of desirability and validation of the product/service with a call to action (feasibility). Gamification, contests, and challenges when designed to be informative, shareable, and connect to the customer base (Ho et al., 2020) can be used to establish the right channels and generate leads with the audience.

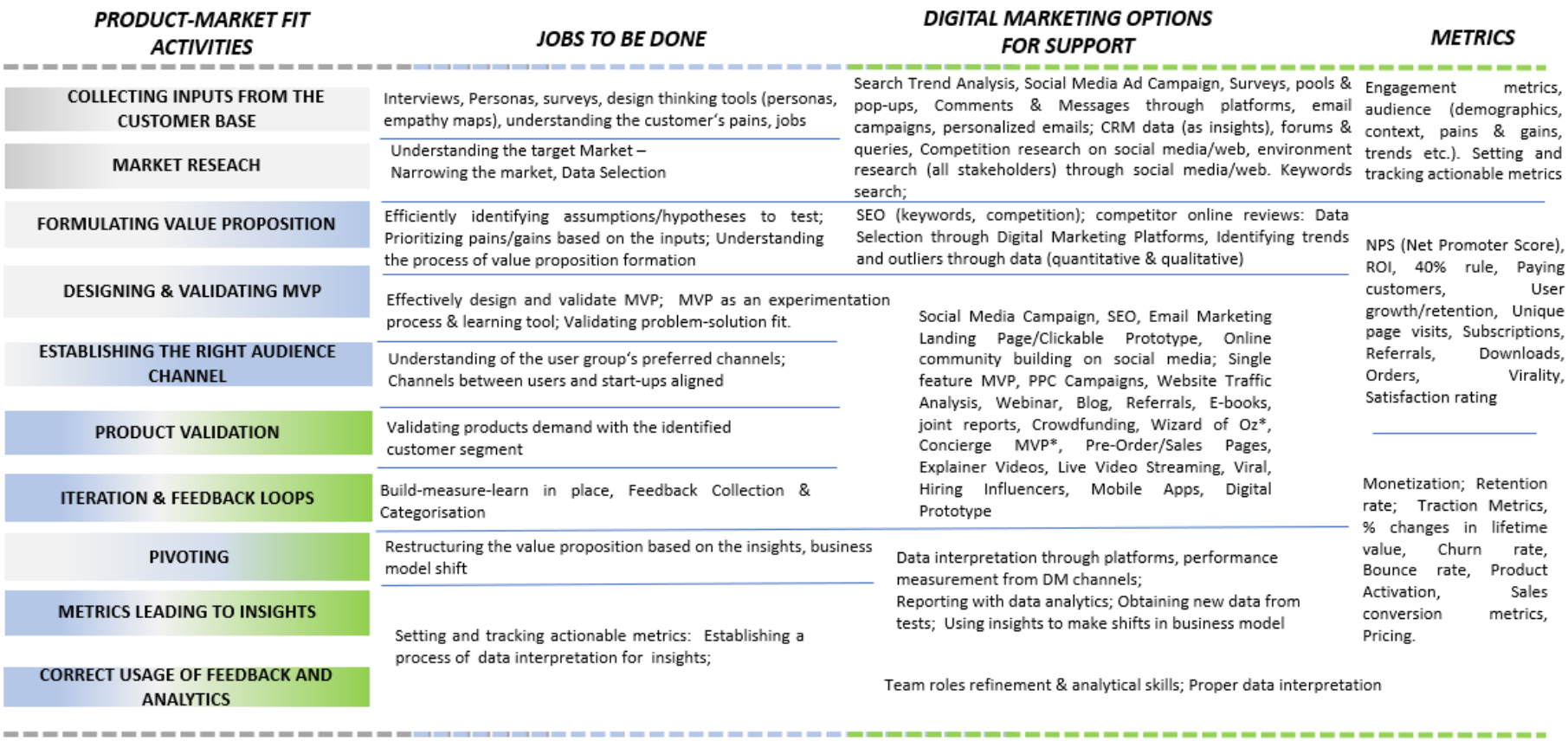


Figure 3.3. Product-Market Fit Activities & Digital Marketing Support Identification (authors elaboration)

The metrics are used to navigate through the activities, the chosen digital marketing tools and tactics. Actionable metrics should be set and monitored in order to use them as an instrument leading to insights (discovering the current situation of the activity) and help with decision-making.

Pivoting marks the situation in which direct or indirect feedback is being translated into a change in the start-up business model (Jay Fuchs, 2022). Digital marketing enables insight-driven pivots from its tools and channels adding to the pivoting process. In this process, translating data into insights is one of the key points for proper data usage. The correct usage of digital marketing tools depends on the start-up's team level of digital marketing, analytical competencies, and creativity the individuals/team have to use the data. Therefore, team skills are one of the critical elements for the effective usage of digital marketing and should be seen as an important element in the overall process.

3.3. Industry examples of product-market fit support by digital marketing

Continuing with different contexts of digital marketing utilization for impacting the product-market fit, in Table 3.1., examples of several start-ups using digital marketing to support their product-market fit activities are presented.

Business-to-consumer (B2C) start-ups can use digital marketing to attract and retain customers, test MVPs, and create targeted advertising campaigns to reach their audience. The team from Pebble developed their smartwatch by validating their first MVP concept through a crowdfunding campaign. The campaign was successfully gaining donations before the product's official launch. The audience backed the concept of the Pebble smartwatch and the team managed to raise more than sufficient donations to start the production.

Table 3.1. Examples of product-market fit support by digital marketing (authors elaboration)

Start-up	PMF Activity & Context	Digital Marketing Support
Buffer.com – Building an audience organically (Fichtner, 2013)	Collecting inputs from customers, MVP & Product Validation	Buffer.com developed a simple landing page asking customers how much they would pay for such a product.
DollarShaveClub – Razors and other personal grooming products (Max Rice, 2020)	Product Validation	The explainer video campaign was used to validate the product. Consequently, customer recommendations led to rapid video dissemination to the right audience.
Pebble - smartwatch (Aastha Kochar, 2022)	Concept - MVP Validation	Pebble validated its MVP concept through a crowdfunding campaign by gaining donations before the product's official launch. The audience backed the concept behind it and the team managed to raise more than sufficient donations to start the production.
Slack – Team Collaboration Tool (Anjali Vanga, 2023)	Iteration and feedback loops, correct usage of feedback	By tightening the feedback loop including feedback from digital marketing channels, the team was able to boost user satisfaction, iterate on the product faster, and get to customer buy-in sooner.

Business-to-business (B2B) start-ups can use digital marketing to educate their target market on the benefits of their products or services. By creating blogs, webinars, or different content and activities, feedback can be collected and filtered to use for further product development. Slack used feedback from digital marketing channels, to boost user satisfaction, iterate on the product faster, and get to customer buy-in sooner. Another example is Buffer.com. The platform Buffer.com used digital marketing to collect insight from customers and simultaneously develop their MVP and product validation through landing pages. The content of the page was simply designed to ask customers how much they would pay for their services and at the same time, as customers subscribed, the start-up got its first customers.

From the presented examples it's visible how digital marketing was used by start-up teams to support product-market in different activities, from feedback loop through digital marketing channels, to MVP and product validation.

3.4. Product-Market Fit and Growth Hacking

As an extension to the process of finding the right alignment, growth hacking tactics are used. Growth hacking is defined as a medium between marketing, information, and communications technology (ICT) with a focus on big data, digital marketing, and artificial intelligence (René Bohnsack and Meike Malena Liesner, 2019). This approach has been widely used by start-ups to scale and grow faster within a digital environment. Growth hacking as a starting point should have a good product with the product-market fit already established (Conway and Hemphill, 2019). Growth hacking achieves its objectives through continuous user involvement in the process of product development (Feiz et al., 2021), which further emphasizes the necessity of using and investing in digital marketing strategies and growth hacking tactics in product development (depending on the status of PMF). For growth hacking tactics, higher investment should happen after the PMF is achieved (Conway and Hemphill, 2019).

3.5. Product-market fit Metric & Indicators

As product-market fit includes the product development stages, and testing (product, channels, audience), the scope of tracking possibilities should include the whole customer journey/sales funnel. Performance tracking is pivotal in understanding the overall growth of start-up actions, including which are the promising channels for further investment (Zylka et al., 2016). Metrics are quantitative measurements and indicators identified through the process of data collection from different sources (eg. total revenue spent, number of customers, customer satisfaction).

Sean Elis introduced a *40% indicator* asking "how would you feel if you could no longer use the product?" and measures the percentage of the "very disappointed" as an answer. Based on his

experience, if 40% responded that they would be disappointed, the PM fit exists. This indicator, along with the satisfaction/referral question (e.g. would you recommend this product to a friend) is practically used in the industry after the product is launched.

User growth needs to be monetized. (Zylka et al., 2016) suggest that measuring the user cycle while using growth hacking needs to have an end-to-end view to realistically collect data and distinguish between the activities which are adding value in terms of generating growth, and the ones only creating traffic but no real revenue growth.

Continuing with the growth metrics, the usual problem star-ups have is to follow the metrics which do not connect to monetization and/or retention. The retention rate is named to be an important overall business metric, usually overlooked by start-up teams (Conway and Hemphill, 2019). If the user growth is high, but the conversion into paying customers is not happening, there must be a pivotal change. For these reasons, the importance of the proper establishment and following up on metrics leading (and maintaining) the PMF represents a vital point of start-up growth.

3.6. Digital marketing & Digital Experimentation on Product-Market fit

Whether it's qualitative or quantitative, the feedback loop of insights (collected through digital marketing) enables start-ups to experiment, learn, and iterate. Digital experimentation is done with low resource usage and does not take much time, having in mind the important fact that the start-up team knows what the effective way of experimentation is and how to implement the activities (and insights).

The activities conducted through digital marketing can impact customer engagement and interactivity (Reto Felixa, Philipp A. Rauschnabelb, 2017) leading to discovery, support, and opportunities for service innovation (Kuester et al., 2018). Decomposing the testing/experimental components within product-market fit processes along with its tools and strategies will reveal an

individual start-up learning process. Starting with metrics, start-ups need to use different metrics and indicators to signal the planned milestones being reached (Zylka et al., 2016). More importantly, digital experimentation should be perceived as an experimentation process leading to value creation (Melegati et al., 2020). In this process, each experiment should discover new data (Konietzko et al., 2020) upon which the decision-making will be made. Thus, collecting and processing the data needs to be done through synchronized actions of analysis and reporting by the start-up team.

The search or upgrades of product-market fit happen with new start-ups and already-formed start-ups with existing users. The process of improving products based on the insights collected from interaction with existing customers can initiate a higher ROI than acquiring new users (Ho, 2016). Through digital experimentation, the feedback gained from the customers enables the creation of systematic tracking and a proactive process of improving products based on the insights collected from the digital interaction. Designing the process of digital experimentation and measuring its success is done through effective planning of digital marketing activities. When established as a frequent and continuous activity, the experimentation can boost the strategy efficiency on an individual activity level, but also as a holistic system component.

3.7. Product Offering and Customer Segmentation

In line with Lean Start-up Approach, as value proposition marks products and services that create value for a specific customer segment, the Product offering (matched with the corresponding customer segment) is a tangible group of product/service features that work together to deliver a specific value proposition for a specific customer (Andrew Eifler, 2016). Due to the ever-evolving digital landscape, start-ups are compelled to continuously adjust their product offering to stay competitive (Ghezzi, 2020). For digital start-ups, product offering along with customer segmentations defines what kind of product is provided for a specific market and customer base (Figure 3.4.). The foundation of developing a start-up product is identifying the customer's "pain points" and using them to enhance their product offerings, providing customers

with valuable benefits or "gains" (Bland and Osterwalder, 2020). The two concepts, product-market fit, and product offering are complementary. The product offering is viewed from the perspective of the customer, meaning characteristics that customers recognize as valuable and usable. While product-market fit as a process is making the right fit between the product and the market, the product offering predominantly focuses on features and benefits the product has for a specific customer segment, from an end-of-product point of view.

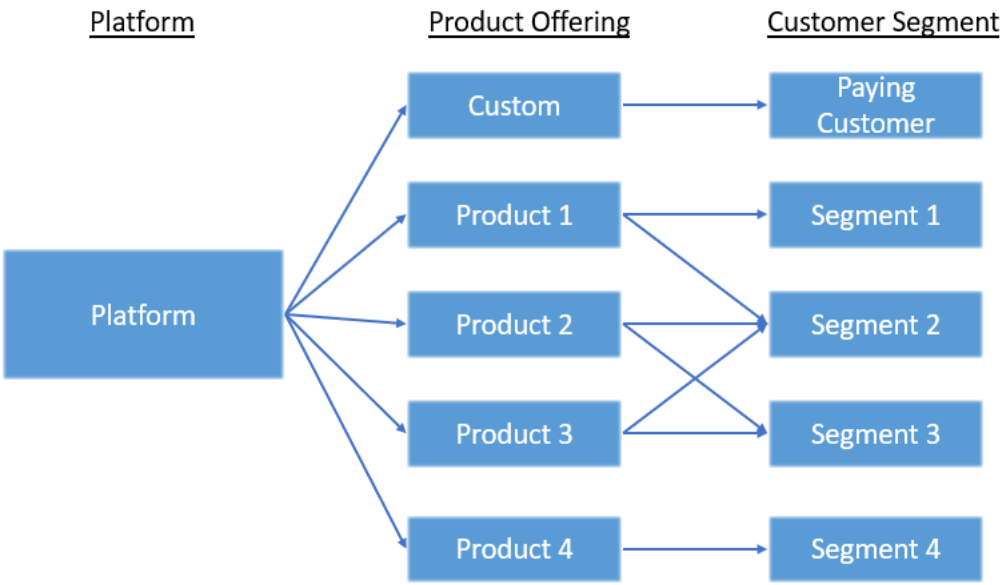


Figure 3.4. Product Offering and Customer Segmentation Process (Andrew Eifler, 2016)

When combined, the two concepts of product-market fit and product offering can represent a systematic overview of product maturity - how prototypes transform into a product that satisfies the market (product-market fit) and the product is recognized on the market from its external, customer views on its usability, features, and benefits (product offerings). Thus, these two concepts can be used to analyze and identify the product maturity points of start-ups (or companies).

3.8. Limitations of using digital marketing in the product-market fit process

Depending on the start-up profile, the product offering, the client base, and different activities, the non-digital techniques are pivotal in this perspective. Although digital marketing has its influence on product-market fit development, non-digital, presential, and face-to-face activities are crucial in discovering customer pains, and elements of product offerings. Some of the main points which address the limited usage of digital marketing for product-market fit are:

- **Client's reach and profiling** - With digital marketing, large audiences can be reached, but the effect can be limited as it may not reach the target customer (due to different channel usage or lack of digital marketing usage in general). Also, different customer profiles, if the offering is not personalized will not be reached based on their preferences.
- **Data privacy and accuracy concerns** – Targeting customers via digital marketing relies on existing data, which may not be accurate and due to privacy limitations will not be fully applicable.
- **Feedback** – Although feedback can be digitally gathered through smart data and qualitative feedback (e.g. reviews on digital platforms), to fully understand customers and create products based on their needs, direct contact and feedback (non-digital) are crucial.
- **Trust Building** – depending on the type of product and service, there might be a situation of lack of trust in the messages delivered through digital channels. In such cases (e.g. medical services) person and direct contact connects to trust building and provides higher credibility with potential clients.
- **Testing & Customer Education** – although digital product testing is usually done online, if there are parts of testing (or products) that are tangible, the testing process needs to include a non-digital aspect to fully understand how customers use the product. Likewise, some products or services may require in-person demonstrations or physical samples, which cannot be provided through digital channels.

- **Dependence on third-party platforms** – if the entire digital marketing strategy is based on a third party (such as Google), the changes in algorithms or policies can highly influence start-ups to reach and maintain communication with customers (Tom Cross, 2022)
- **Traditional vs. digital channels** – Depending on the customer group and the product itself, some customers can still be favorable to the traditional way of product/service delivery and communication (e.g. if the product is used by seniors or high-luxury products that demand face-to-face interaction).

To mitigate the limitation, the necessary non-digital activities for impacting the product-market fit are used as a stand-alone activity or a complementary activity with digital marketing.

3.9. Non-digital activities for product-market fit

Although this work is focused on investigating how digital marketing helps start-ups to establish and maintain their product–market fit, it's essential to point out the non-digital activities used for the product-market fit formulation.

Interviews & Meetings (Customers, Partners & Suppliers)

Nothing trumps interviews in discovering customer pains and gains, especially in the product discovery phase. Partner & Supplier Interviews are used to disclose if a start-up can feasibly run the idea with the partners & suppliers (Bland & Osterwalder, 2020). Interviews help gain qualitative insights into which value proposition can be formulated for a targeted customer segment. As such, interviews are used in all PMF activities, particularly in the early discovery phases of collecting inputs, market research, and formulating value propositions.

Events, Tradeshows, Pop-ups

While testing and validating the MVPs and products/services, physical events should not be excluded as they open the space for an opportunity to collect ideas, have product discussions, and direct sales. With start-ups opening up to new markets and trying to enter a specific niche market, events and tradeshows help to connect and get insights on how to adopt parts of the strategy for market calibrations.

Focus groups

Focus groups are a useful tactic to gain insights from a targeted group of participants. During the discussions in focus groups, the participants are usually asked variants of open-ended questions which can lead to discoveries in customer habits and behaviors. Focus groups can also be done through video calls, but a significant loss of insights can be lost.

Brochure, printing materials, and 3D printing

Usually used with testing activities, they represent tangible methods to gain discoveries on products. These activities are helpful for context and qualitative insights for upcoming experiments but have limited reach for overall customer insights. The prototype from 3D printing is used to showcase the product and in some cases product features (for example if sensors are used). With brochures and other printing materials, the call to action exists, but it takes more initiative on the customer's side to read through it, and then make a call or email you to find out more about the value proposition (Bland & Osterwalder, 2020).

Sales Force Feedback & Customer Support

The use of sales force feedback and customer support can be used to uncover unmet jobs, pains,

and gains in products or services (Bland & Osterwalder, 2020). These techniques can be used in start-ups and products which already have existing customer support and a certain amount of existing customers.

Community engagement

Engaging with local communities and industry organizations can provide start-ups with valuable feedback and insights into the needs and preferences of different customer groups, especially if a start-up is developing a community-engaged or social entrepreneurship idea.

3.10. Summary

Product-market fit refers to the moment when a start-up's product or service satisfies the needs of the targeted customer segments, resulting in significant customer conversions and sales growth. Digital marketing can play a significant role in supporting start-ups to achieve and maintain the product-market fit by enabling them to gather feedback (Zylka et al., 2016), track user behavior, and ultimately refine their offerings. By leveraging social media, email marketing, and search engine optimization (SEO), start-ups can effectively engage with potential customers (Bland and Osterwalder, 2020), gather insights on customer behavior, and create a loyal customer base. Designing indicators for the product-market fit process helps start-ups track and measure the success of their product or service, identify improvement areas, and further refine their offering toward the targeted audience. When digital marketing activities are matched with the product-market fit process, it becomes a useful tool for the number of connected activities that start-ups can use to accelerate their journey toward product-market fit.

4. DIGITAL MARKETING PERFORMANCE MEASUREMENT

Digital marketing performance measurement captures digital behavior through the customer journey. The point of tracking and measuring the digital performance of a company is made to understand and identify the trends of consumer behavior and engagement exposed on certain digital marketing channels. Performance analysis of online consumer behavior is enabled with digital marketing tools (eg. social media, web analytics), business points (connected to KPIs, ROI or others), and established metrics systems in an organization. Key performance indicators (KPIs) are defined as quantifiable measures of performance over time for a specifically identified goal. Return on investment (ROI) in this context is defined as investment performance evaluation through digital marketing channels.

4.1. Types of digital marketing performance measurement frameworks

Research and industry applications of digital marketing performance measurement frameworks are done through social media (and all the associated activities and methods made through this digital marketing channel), and overall web analytics (including all types of analytics and activities derived from digital marketing channels).

4.1.1. Social Media and Performance Measurement

By examining the link between social media customer engagement and the assessment of its effects and benefits (Barcoe & Whelan, 2018) investigate how social media performance is

measured in the tourism industry. As demonstrated in Figure 4.1., the balanced scorecard and BCG matrix have been employed as performance analysis tools to evaluate the effect of social media on return on investment (ROI) in destination tourism. The BCG matrix is a strategic tool used to evaluate the relative performance of a company's business units, products or brands. The analysis of social media performance in this work was focused on connecting engagement and ROI from social media, including CRM pre/post-consumption models of engagement. Through the BCG matrix, the companies monitoring the ROI through social media revealed that social media engagement indicated where the next destination purchase may appear. Following the engagement analytics, routes with the least amount of social media engagement generated fewer sales (Barcoe & Whelan, 2018). In this performance analysis, the KPIs companies follow where social engagement metrics (such as Links, impressions, social shares, and video views for Facebook) and KPI scale of online advertisements via paid media (such as Reach, Impressions, Downloads, Impressions, Unique visitors, Page views, links clicks for Google). This research was oriented towards the external points of performance analysis (without including the internal capabilities of companies and how data flow from social media is transferred through the company).

Figure 4.1. BCG Matrix using social media activity as a performance analysis (Barcoe & Whelan, 2018)

In their research, (Marchand et al., 2021) identify social media performance through innovation and interaction orientation, including dynamic social media-specific capabilities (i.e., social media strategy, social media employee activities, social media measurement) and the social media budget as a strategic resource. Besides these constructs, the firm's social media performance and brand perceptions were also connected to the framework, with an emphasis on internal skills development and performance tracking. Through the performance models, the CRM is identified as one of the key points for impact measurement. (Trainor et al., 2014) analyses social media performance through interactive effects of customer-centric management systems and social media technology use on social CRM capabilities. The results supported the fact that companies actively use social media applications in their CRM activities and internally develop greater social CRM capabilities.

Systematic tracking of the metrics is one of the key elements for successful performance measurement. The performance metric system of social media encompasses several dimensions of indicators and (D. Agostino, 2016) outlines the following categories: financial indicators, network structure indicators, interactions indicators, content indicators, and sentiment indicators depending on the type of social media contributions that need to be assessed. Continuing with the focus on performance metrics, (Saura et al., 2017) suggest basic KPIs that companies should follow and analyze: conversion rate, goals conversion rate, type of users, type of sources, keywords/traffic of non-branded keywords, and keyword ranking.

Social media enablement of performance measurement is mostly investigated through the prism of ROI, CRM dimensions, and metrics systems for process tracking. What's indicative in these investigations is that companies rely on social media data analytics (while combining the effective metrics) to influence decision-making on innovative activity, customer-centric actions and use the combined data from CRM tools.

4.1.2. Web analytics

The practical implementation of performance measurement needs to be developed for a holistic understanding of the elements that affect the company's ability to design and exploit a marketing metrics system (Pettigrew, A., Whipp, R., & Rosenfield, 1989). Digital marketing performance measurement represents an integrated analysis of the organizational ability to gain insightful learnings, based on the implemented digital marketing activities. With the correct system in place, which includes internal capacities, performance measurement and data integration, the process of how data is transformed into insights is enabled. In the study of (Järvinen & Karjaluoto, 2015) the performance measurement framework with web analytics (WA) draws on strategic management literature and defines the dimensions of content, process, and context as relevant dimensions of performance measuring (Figure 4.2.). With WA as the basis of the performance analysis, the study investigates how companies define web analytics metrics, the processing of WA data, and the organizational context of WA use. This approach relies on the key interconnected activities in digital marketing performance measurement: processing digital marketing data (data gathering, analysis, and reporting), followed by metrics and what is measured (digital marketing channels data connected to the strategic objective), depending on internal capabilities (team skills & knowledge, communication flow) for analyzing the outcome efficiency.

The result of the study emphasizes the importance of the following points for successful performance measurement in the digital (web analytics) environment:

1) designing a manageable metrics system that demonstrates the progress toward marketing objectives,
2) establishing a process that fosters the effective use of metrics data within the organization,
3) ensuring that the organizational context supports the use of the metrics system.

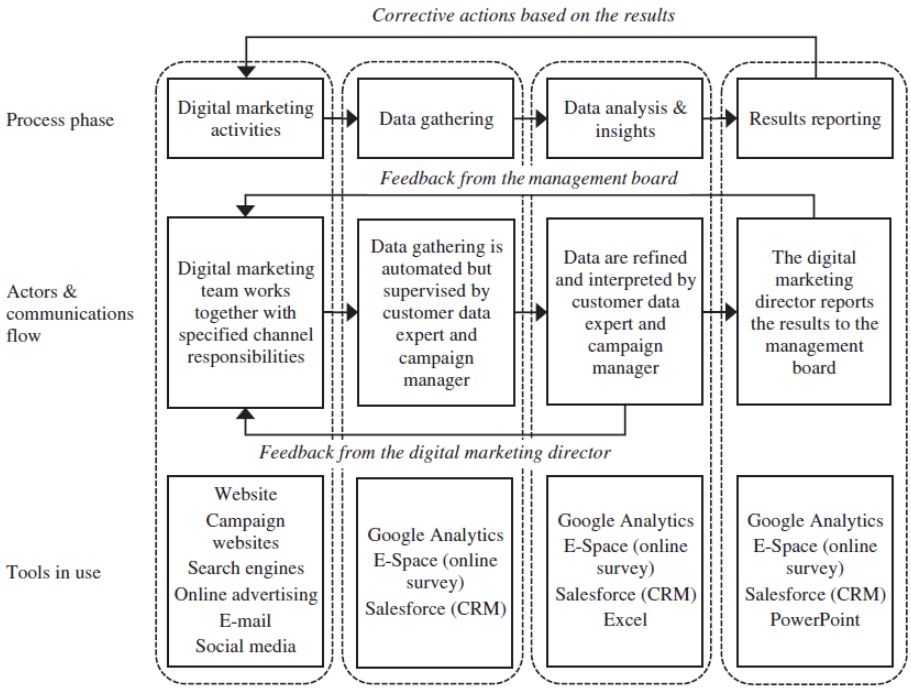


Figure 4.2. Digital marketing performance measurement process and tools in use (Järvinen & Karjaluoto, 2015)

The success of digital performance measurement use is connected to companies that devote resources, design procedures, and organizational culture (Järvinen & Karjaluoto, 2015). The overall system of performance measurement is followed by continuous feedback and reporting throughout all teams/departments in the organization.

4.2. Data analysis and interpretation of digital marketing analytics

As start-ups use integrated data from the platforms, connected data to CRM or any other software that tracks online behavior and generate insight, the *how* it's done and interpreted is one of the main challenges since this process is often unstructured or loosely structured (Camilleri, Mark, 2019). In this perspective, the internal, organizational actions and practices which organizations implement dictate how the data is treated, analyzed and used for data-driven management and decision-making. Data analysis involves actions dedicated to preparing the data for interpretation and converting data into insights. As one of the possible data

interpretation instruments, the Data Processing Cycle (Camilleri, Mark, 2019) identifies three points of data processing (Figure 4.3.).

Capturing Data	Online and mobile users' behaviour in real-time Customer service records Referral sources and product recommender systems Consumers' personal preferences Website activity Social media networks Ecommerce platforms Comprehensive information in a database
Analysing Data	Descriptive analytics Predictive analytics Prescriptive analytics
Distributing Data	Programmatic advertising Blockchain distributed ledger technology

Figure 4.3. Data Processing Cycle (Camilleri, Mark, 2019)

Starting from capturing the data through different channels and touchpoints, analyzing the data, and data distribution as a final process. The authors also include data from emerging technologies to be used as part of data distribution.

4.3. Internal team resources

Successful start-up growth is supported by the empowerment of its internal community, start-up founders, and team (Raman and Raman, 2018). This aspect of growth is also identified through opportunities for business process development of digital marketing via data analytics. As analytics are defined and measured by indicators, this ongoing process sets an opportunity for monitoring the progress of digital marketing performance measurement and influencing future business development. The process of collecting and converting information from digital interactions (data, reviews, comments, etc.) powered by analytics, impacts service innovation

design (Kuester et al., 2018). When established as a continuous process with a direct insight into possible innovation, digital marketing & analytics possibilities can shift into an internal process which can lead towards the opportunity for new value creation.

Simultaneously, building a data-driven culture in start-ups can help with the interpretation of data analytics by ensuring that data is being used throughout the organization to inform decision-making. In this kind of culture, teams are encouraged to test different concepts, be more entrepreneurial, and base their decisions on received data. In this matter, insights based on data are not solely used for performance measurement but also to identify areas of improvement and new opportunities. As start-ups tend to have challenges of lacking resources and building entrepreneurial teams (Oliva et al., 2019), the difficulty in this aspect is also having a skilled team able to design an environment supporting data-driven culture.

With a culture that prioritizes data, start-ups can better understand their audiences, and products and build performance measurement systems that support the start-up governance. Additionally, a culture that prioritizes data can foster a continuous learning environment within the team, where they can test assumptions, learn, iterate and make improvements based on the insights.

4.4. Digital Marketing Performance Measurement, Start-ups, and Product-Market Fit

The process of measurement is led by several points of internal start-up context and operational activities within digital marketing. In this process within the digital scope its important the identify and establish the business components and data points based on which the evaluation of performance measurement can be made and optimized, specifically focusing on product-market fit and start-up environment.

4.4.1. Digital Experimentation

Digital experimentation is characterized by high data availability and new insights opportunities (Gupta et al., 2020). This fact is especially important from the digital marketing perspective as the data obtained from the digital marketing tools needs to be meaningfully utilized, as a set of learnings for product/value improvements and decision-making. The utilization of digital tools supporting the experimentation process is beneficial since the data received from the platforms has all the requirements to be seen as experiment data (replicable and comparable). In Table 4.1., the research findings on start-ups, product-market fit and digital marketing usage involving digital experimentation are presented, as well as the potential of performance measurement within the scope of the data conversion process. The domains of Table 4.1. were adjusted based on Factors influencing the prototype-centric learning loops (Anh Nguyen-Duc et al., 2017). As prototyping is one of the key activities for product-market fit experimentation, this work was found insightful as it maps out the process of prototyping and organizational learning in the environment of digital start-ups, with the added domain of Key metrics following the process.

The experimentation process should be easily replicable (Bland & Osterwalder, 2020), and seen as a set of testing loops, rather than product versions (Melegati et al., 2020), especially while the start-up is still searching for product-market fit. Organized learning should be enabled through the digital experimentation process as one of the main process challenges (Tripathi et al., 2019), and digital marketing solutions can be used to disseminate the learning. Through social media camping the audience can be defined (Rene´ Bohnsack*, 2019). Traffic and other types of analytics can be used to understand the customer base, iterate and evaluate the efforts of the MVP learning process.

Key performance metrics should be regularly tracked and include customer retention (Conway & Hemphill, 2019), different types of conversion rates (Saura et al., 2017) (Zaheer et al., 2019),

referrals, and other metrics with actionable, accessible, and auditable characterizations (Ries et al., 2011).

Table 4.1. Digital Experimentation & Potentials of digital marketing performance measurement in start-ups (authors elaboration)

Domain	Start-up Needs, Activities and Measurements points	Potential for Digital Marketing Performance Measurement	Proposed optimization components
Digital Experimentation & Conversion			
Experimentation process	The MVP as an experimentation tool is mainly perceived as a version of a product, rather than as an experiment process (Melegati et al., 2020); In the start-up phase, the team can also neglect development points as architecture, design and testing, (Crowne, 2002) For pre-product-market fit software start-ups the challenges are to systematically identify the riskiest assumptions, describe the assumptions in a testable way (metrics), and have practical knowledge of how to efficiently test assumptions through experiments (Gutbrod et al., 2017);	Buying cycle/customer journey touchpoints establishment (Bhandari, 2017); Experimentation through digital marketing can be done with surveys and social media (Digital Marketing Institute, 2017), clickable prototypes (Bland & Osterwalder, 2020), landing pages, a/b tests (Conway & Hemphill, 2019)	Designing and running experiments with digital marketing Developing hypotheses, defining problems & opportunities
Feedback Identification & Learnings	Defining Minimum Viable Product is a Start-up challenge (Nguyen-duc, 2020); The occurrence of problem-solution fit negligence (Tripathi et al., 2019); Experiments should be easily replicated by team members while generating usable and comparable data (Bland & Osterwalder, 2020);	Social media evaluation process and measuring ROI (Silva et al., 2020); using platform data from social media campaigns to define the audience (Rene´ Bohnsack*, 2019) Traffic data analysis on the website is used as a tool for optimization, testing and understanding customer behavior (Bland & Osterwalder, 2020).	Conversions through Data Analytics
Key performance metrics	Key performance metrics are defined through user growth, gross profit margins, and sales conversion ratios (Zaheer et al., 2019); Sean Elis - 40% indicator asking "how would you feel if you could no longer use the product?";	Customer retention as one of the key start-up metrics, usually overlooked by start-up teams (Conway & Hemphill, 2019); KPIs companies should analyze: conversion rate, goals conversion rate, type of users, type of sources, keywords/traffic of non-branded keywords, keyword ranking (Saura et al., 2017);	Identification of key metrics (e.g. Retention rate & Referrals)

With digital experimentation, digital marketing activities become an informational hub for MVPs, testing, product validation (including most of the product-market fit activities) and highly depend on the start-up's ability to make conclusions based on received data (or if outsourced, how the process of data transfer is received and processed back into the start-up). Measuring the progress of experimentation and using data analytics processes can support start-ups to determine and optimize their testing on product offerings, determine their customer segments, and establish feedback systematization in their ecosystem.

4.4.2. Digital Marketing Analytics & Data Interpretation

Digital marketing analytics identify marketing data deriving from digital marketing channels which are analyzed and converted into actionable business data. Digital marketing analytics (the used term is also digital analytics with the difference that data digital analytics includes all business data, including digital marketing analytics) helps organizations to understand the market, track customer behavior, and use this data for decision making. As start-ups lack staff and skills for proper data interpretation to actionable insights, the process of converting data analytics into insight, and its valorization marks one of the most challenging points of organizational development.

Based on the research findings, in Table 4.2., the potentials for performance measurement of Digital Marketing Analytics & Data Interpretation are presented. The domains were adapted from the Social Media Marketing Evaluation framework by (Keegan and Rowley, 2017) proposing stages of data maneuvering in the social media context. To make the domains more applicable to all digital analytics, the Quality of analytics part from Key capabilities required for analytics-driven performance improvements (Chaffey & Patron, 2012) is integrated. The aligned digital analytics can be seen as a first step in data interpretation. Meaning that setting the KPIs, CRM, and processes which enable proper data interpretation affects the interpretation itself. Integrated CRM helps companies to identify connected data of customers and differentiate between

customer segments. It also brings multiple departments together and empowers connected teams with systematic data through CRM software.

Table 4.2. Digital marketing analytics & potentials of digital marketing performance measurement (authors elaboration)

Domain	Start-up Needs, Activities, and Measurements points	Potential for Digital Marketing Performance Measurement	Proposed optimisation components
Digital Marketing Analytics & Data Interpretation			
Digital Analytics & Metric Context	Start-ups need to use different metrics and indicators to signal the planned milestones being reached (Zylka et al., 2016); Continuous development and innovation as a start-up's primary objectives in strategic development, with innovations supported by technology and upgrades (Kannan Dinesh et al., 2019)	High data availability and new insights opportunities (Gupta et al., 2020); Decision-making involving market and technology aspects is supported by performance measurement (Bekhradi, 2018);	Technology and data analytics used from digital marketing tools
Insights & Feedback	Start-up failure due to the learning process during minimum viable product (MVP) development (Tripathi et al., 2019); The proactive process of improving products based on the insights collected from interaction with existing customers can initiate a higher ROI than acquiring new users (S. Y. Ho, 2016);	Audience-channel fit (in social media) is used for content distribution and feedback for content design improvement (Yaghtin et al., 2019)	Systematic Feedback
CRM capability	Recognizing the customer drivers, values, and motivations of the customers will help to overcome obstacles towards acquiring the targeted consumers (Lehnert et al., 2019)	Information generation with social media for conducting market research, detecting changes in our customers' product preferences and fundamental shifts in the industry (e.g., competition) (Trainor et al., 2014)	Digital CRM capability
Process of performance and reporting tracking	Actionable, accessible, and auditable, characterize a starting point of tracking start-up idea evolvement (Ries et al., 2011); Operating in fast-changing and competitive environments, continuous experimentation is crucial for learning and bringing products fast-to-market (Anh. , Nguyen-Duc et al., 2017)	Sales managers actively use sales analytics tools and forecasting data to leverage and make strategic business decisions for the next year (HubSpot Research Global Sales Enablement Survey, 2020); Social analytics tools need to generate performance reports, impacting the success of SMM(Keegan & Rowley, 2017)	KPIs and process tracking

Digital analytics enable performance measurement, which directly supports the decision-making process for the market and technology aspects (Bekhradi, 2018). As digital analytics is strongly connected with technologies used to navigate through the analytics and get proper insights, the role of used technologies (software and platforms) becomes highly important for the process's success, and the data interpretation.

4.4.3. Internal Capacities, Skills & Culture

Industry and academia point out the need to further investigate the structure and organization of marketing operations in companies (Kannan & Alice, 2017). Table 4.3., encompasses the needs and opportunities for digital marketing start-ups' internal capacities and culture. Domains were adapted from (Chaffey & Patron, 2012) proposed key capabilities required for analytics-driven performance improvements identifying people and processes as the main challenges in the Quality of the management process. The literature emphasizes internal resources and defined team roles (Tripathi et al., 2019), along with team collaboration (Lopez Hernandez et al., 2018) as essential points for start-up operational activities, and the need to develop these capabilities. Thus, even with the most sophisticated tools used for digital analytics, without the proper team alignment and skills necessary to turn data into insights, digital analytics infrastructure will be almost futile.

The data analysts along with collaboration with other departments (e.g. sales, CRM) bring out the full potential of digital marketing influence as its complementary (traditional) role within marketing and overall start-up activity. Start-ups that have a strategically clear vision and structured activities around social media marketing, do not have unnecessary information loss on customers, and have a more structured process for customer learning (Buratti et al., 2018). This kind of effort is followed by a higher commitment of senior management and signalizes organizational culture relying on data-driven processes. Designed usage of digital analytics simultaneously manifests that some marketing metrics systems are being used to track and meaningfully utilize the data.

Structured educational practices on digital marketing subjects and creativity can foster collaboration and innovation, which are usually recognized as key drivers of growth in organizations. From the skills perspective, digital marketing professionals consider strategic planning, digital marketing and creativity as the most relevant to their work, and intend to have more training activities on creativity (Monge Benito & Etxebarria Gangoiti, 2017).

Table 4.3. Digital marketing usage and internal capabilities & culture (authors elaboration)

Domain	Start-up Needs, Activities and Measurements points	Potential for Digital Marketing Performance Measurement	Proposed optimisation components
Internal capacities & Culture			
Team & Collaboration Capacity	The team's collaboration capabilities are the essential ability to guide and organize operative capabilities and foster the creativity and knowledge of each team member within the context of the Start-up (Lopez Hernandez et al., 2018)	Internal resources are essential for identifying the requirements of the product idea for MVP development (Tripathi et al., 2019).	Team roles & digital marketing
Skills	Higher level of development mandates higher levels of knowledge adoption management - practices and tools representing planning, execution, and control of the knowledge process (Oliva et al., 2019).	The process of using data analytics will depend on the team and internal skills available, which are defined as one of the main start-up challenges (Giardino et al., 2015). Creativity as one of the most relevant skills to digital marketing professionals (Monge Benito & Etxebarria Gangoiti, 2017).	Skills development (Education practices, Creativity)
Organizational culture	Organization's efforts to use marketing metrics systems cannot be understood without considering the logic behind the chosen metrics, the processing of metrics data, and the organizational context surrounding the use of the system (Järvinen & Karjaluoto, 2015)	To prevent unnecessary risks such as the loss of information on customer needs from unstructured social media usage, creating a social media marketing (SMM) strategy requires a higher level of commitment and a strategically clear vision of the SMM role within the company (Buratti et al., 2018).	Culture & Senior Management role

Although usually seen as mutually exclusive concepts - data (rigid, standardized) and creativity (intuitive, visionary), their bond in the digital analytics context makes a significant impact on how the data is understood and made insightful. By combining education practices, and creativity with data-driven environments, organizations can create a culture of experimentation, which also adds to the point of developing higher levels of knowledge adoption management, a significant point for start-up development (Oliva et al., 2019). Using the data provided by platforms and converting it to understandable insights obliges professionals to think creatively about how to make it as useful as possible. As the complexity of data analytics grows, so does the need to make the data in a simplistic, understandable matter and present results through different methods and models. Furthermore, as established by (Palos-Sanchez et al., 2020), creativity in start-ups influence the ability to identify start-up opportunities and the development of new strategies.

4.5. Balanced Scorecard and digital marketing performance measurement

The balanced scorecard puts strategy and vision at the center (rather than control), and it establishes goals while assuming that people will adopt whatever behaviors and take necessary actions to arrive at those goals (Robert Kaplan and David P. Norton, 1992). When a situation calls for many interlinked connections, as in the case of digital marketing interactions, the principles of a balanced scorecard are used for performance measuring the links and goals. By combining the financial, customer, internal process and innovation, and organizational learning perspectives, the balanced scorecard helps companies to understand interrelationships at the minimum on the implicit level, including moving to higher improvements (Robert Kaplan and David P. Norton, 1992). With all the interrelationships mentioned, its suggested that the balanced scorecard is a performance metric tool used in strategic management to identify and improve a company's internal activities.

Using the scorecard approach for digital marketing performance measurement, (Fatin and Rahman, 2020) suggest a theoretical framework of Digital Marketing Balanced Scorecard including customer, operational, financial, business value, and Innovation & growth

perspectives. The balanced Scorecard in the perspective of digital marketing performance measurement enables managers to identify their use of digital analytics with all connected activities, and optimize. While using the balanced scorecard, (Fatin and Rahman, 2020) suggest that for a balanced scorecard to have high levels of accountability, it should be developed as a quantifiable tool giving actionable insight for improving digital interrelations in the company's internal management.

4.6. Summary of research gaps connecting digital marketing, product-market fit, and performance measurement

Existing research investigates different objectives impacted by social media as one of the marketing channels mostly involving sales stimulations, brand, an increase in customer engagement, interactivity, and traffic generation (Reto Felixa, Philipp A. Rauschnabelb, 2017). Nevertheless, companies can also implement social media marketing for other, more dynamic business areas (Reto Felixa, Philipp A. Rauschnabelb, 2017), such as product development.

From a B2B knowledge management perspective, there is a lack of academic work on the dynamics of online interaction (users-company) and learning orientation on digital marketing channels (Yun Wang, Michel Rod, Shaobo Ji, 2017). If we connect digital marketing and the business model itself, (Batocchio et al., 2017) propose more investigation on what criteria can be used to determine if an indicator is suitable for validating a choice in a business model? The interconnections between these actions call for a more systematic outlook on digital marketing activities impacting start up-growth, and how, when used as a strategic tool, can they impact several start-up challenges.

Table 4.4. Research gaps connecting digital marketing, product-market fit and performance measurement (authors elaboration)

Category	Description
Digital Marketing Frameworks & Strategies impacting Start-up Growth	
Digital Marketing Channels & Objectives	Articulation and realization of social media marketing objectives (Dwivedi et al., 2020); Content creation in business model innovation (Mansour and Barandas, 2017); Content management strategies of social media as an opportunity for customer relationship building (Herhausen et al., 2020)
Indicators & Data Interpretation	More research in linking start-up performance with consumer-centric innovation (Davila, 2020); Lack of work on dynamics of online interaction (users-company) and learning orientation on digital marketing channels (B2B) (Yun Wang, Michel Rod, Shaobo Ji, 2017)
Product-market fit & Experimentation	
Establishing & maintaining the fit	How to obtain a product-market fit, through product development and growth hacking techniques (Zaheer et al., 2019a); How to set activities for designing minimum Viable Product with the number of iterations (Nguyen-duc, 2020); Make the fit through customer co-creation (Akter and Iqbal, 2020)
Indicators & Data Interpretation	Identifying the riskiest assumptions, turning the assumptions into metrics, and practical testing through experiments (Gutbrod et al., 2017); Start-up founders are not aware of how to gain insights and have DM activity results in a more structured way (Kaur and Kumar, 2020b); Identifying the actions leading to customer retention (Conway and Hemphill, 2019)
Digital Marketing Performance Measurement	
Designing the measurement environment	Understanding organizational processes for data analytics interpretation (Silva et al., 2020); Research on DM performance measurement with web analytics are scarce and theoretical undeveloped (Järvinen and Karjaluoto, 2015); Adapting to emerging technologies, starting from the bases of big data towards the higher levels of emersions (Chylinski et al., 2020)
Indicators & Data Interpretation	Which data analytics offer the most meaningful insights (Dwivedi et al., 2020); What criteria can be used to determine if an indicator is suitable for validating a choice in a business model (Batocchio et al., 2017);

How organizations articulate and realize their social media marketing objectives and which data analytics offer the most meaningful insights to support the development of the campaigns (Dwivedi et al., 2020) are still identified as gaps in the literature. Connecting start-ups and customer-centric approach (Davila, 2020) propose more research in linking start-up performance with consumer-centric innovation through the implementation of appropriate marketing strategies.

In the aspect of establishing the product-market fit, how to design an MVP (Nguyen-duc, 2020), make the fit through customer co-creation (Akter and Iqbal, 2020), identify the actions leading to customer retention (Conway and Hemphill, 2019), are gaps which remain to be answered. From the team aspect, it has been perceived that start-up founders are not aware of how to gain insights and look at the digital marketing activity results in a more structured way (Kaur and Kumar, 2020). Concrete examples of research on digital marketing performance measurement with web analytics are scarce and theoretically undeveloped (Järvinen & Karjaluoto, 2015). With data analytics, the mosaic of possibilities got an enriched portfolio of targeting and personalization throughout the whole customer journey.

Messaging systems, reviews and feedback are being used as a channel for support, discovery, and opportunities for service innovation (Kuester et al., 2018). Partnering up with similar start-up to raise brand awareness while generating leads becomes one of the strategic points in product promotions.

We can summarize that all the above-mentioned actions and research points out the need for further research and practical applications connecting the subjects of start-up growth, product-market fit, and digital marketing performance measurement (Table 4.4.). Thus, in this particular context, this work focuses on discovering how digital marketing supports start-up growth. Secondly, how start-ups can test their ability to impact their product-market fit through digital marketing (and its performance measurement options).

5. DM_OPTIMA FRAMEWORK DEVELOPMENT

The DM_Optima is created by the author based on the collected literature and practical industry inputs on how digital marketing can be used to optimize the product-market fit process. The purpose of the framework is the identify the main points of performance measurement between digital marketing usage and its impact on start-up operations.

The DM_Optima Framework uses the components of the performance measurement system activities and links them with components specific to one start-up's key activity (growth driver) – product-market fit. Through this work, a systematic literature review was made and a Macro-dynamic framework was designed to encompass the digital marketing impact on key start-up activities. The insights from this framework were used for DM_Optima Components development (Figure 5.1.), specifically product-market fit, as a growth driver.

During this research, it was established also that the start-up's Internal capacities and Culture were recognized as complementary drivers in process of establishing the product-market fit. Thus, DM Optima has two main elements of its design: the Macrodynamic Framework (focusing on Product-Market fit and Internal capacities & Culture) and Digital Marketing Performance Measurement, integrated into the start-up environment.

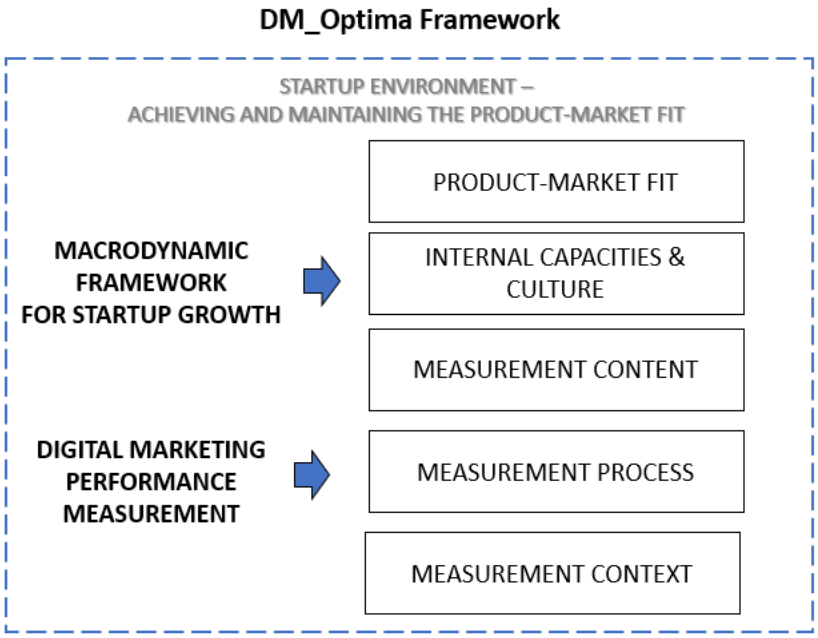


Figure 5.1. Conceptual scheme of the DM_Optima Framework

5.1. Macrodynamic framework for Start-up Growth

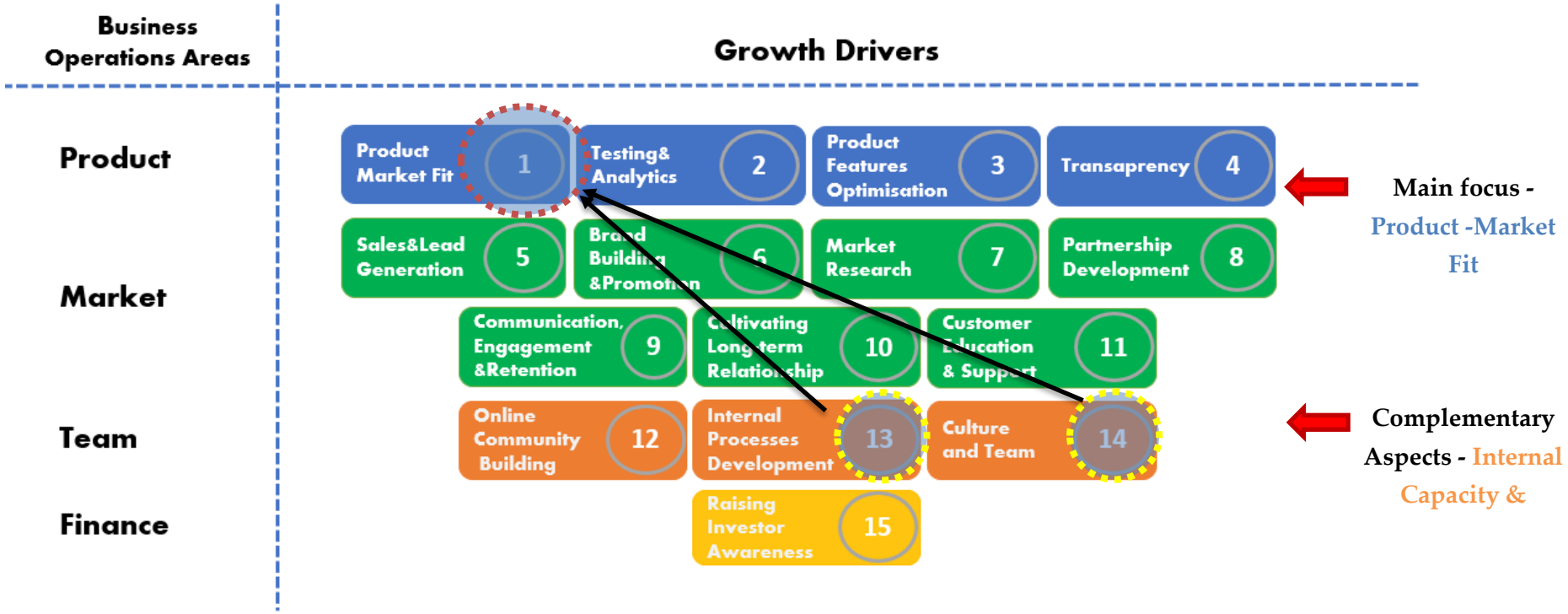
As researched in the literature, no framework or overview has been identified which connects the overall influence digital marketing can have on start-ups as a potential driver of start-up growth within start-up key activities and areas.

Based on the systematic literature review of this work, this Framework was made. The Macrodynamic Framework identifies 15 growth drivers supported by digital marketing, accompanied by digital marketing strategies and tactics. Furthermore, it exemplifies how digital marketing supports product-market fit, experimentation & testing on digital platforms (Rizvanović et al., 2023). In Figure 5.2. A Macro-dynamic Framework identifying Growth Drivers and Digital Marketing Strategies & Tactics for achieving Start-up Growth is presented (more insights and detailed information on this Framework have been published in the article - Linking the potentials of extended digital marketing impact and start-up growth: Developing a macro-dynamic framework of start-up growth drivers supported by digital marketing" (Rizvanović et al., 2023)).

The framework starts with presenting growth drivers connected to the appropriate area of key activities from the product, market, team and financial aspects. The growth drivers encompass the identified macro influence of digital marketing on start-up challenges and maturity (as presented in the second and third thesis chapters).

As the Macro-dynamic framework outlines the usage of digital marketing for start-up growth, it also points out the different applications of digital marketing connected to product-market fit and potential areas of performance measurement. Although start-ups use digital marketing in product-market fit activities, identifying it as one of the possibilities for performance measurement and optimization still lacks actual applications.

Furthermore, through this work's research, it was also established that resources used to collect and interpret data, and internal process designed to support the data interpretation, influences the start-up's ability to make the Fit.



- *The growth drivers are linked with the digital marketing strategies and tactics (with affiliated numbers) in the following Figures 5.2. b & c*

Figure 5.2. (a) Macro-dynamic framework identifying Growth Drivers and Digital Marketing Strategies & Tactics for achieving Start-up Growth (authors elaboration)

No	Digital Marketing Strategies & Tactics	Digital Marketing Tools/Channels	Growth Drivers
1	Social media campaigns & promotional posts	Social Media& Content Marketing	1. 5. 6. 9.
2	Recruitment Posts	Social Media& Content Marketing	6. 9. 13. 14.
3	Authentic content – Founder's story-telling, frequent blog, education on innovation origin, e-books, podcasts, webinars	Social Media& Content Marketing	5. 6. 9. 11. 15.
4	Content shared from other sources (Reports, e-books, podcasts, industry news)	Social Media& Content Marketing	6. 8. 11.
5	Content Cocreation (by community members, contributors, partners)	Social Media& Content Marketing	9. 10. 12. 14.
6	New product feature announcement, product usability messaging	Social Media& Content Marketing	3. 9. 11.
7	Partnership building – joint reports, e-books, podcasts, promo sharing, webinars	Social Media& Content Marketing	5. 6. 8. 10.
8	Contests, challenges, and gamification	Social Media& Content Marketing	5. 6. 9.
9	Hiring Influencers	Social Media& Content Marketing	3. 5. 6. 10.
10	Loyalty & Referral Program	Social Media& Content Marketing	5. 6. 9. 10.
11	Online community building	Social Media& Content Marketing	9. 10. 12.
12	Customer Support/ Feedback Messaging	Social Media& Content Marketing	10. 11.
13	Transparent communication & content (Understandable privacy policy, transparent content)	Social Media& Website& Content Marketing	4. 6. 9. 11. 14.
14	Market research via platforms - Competition scanning, search trends, keyword optimization, the search of demotic and negative keywords	Website, Social Media, SEO&SEM	1. 2. 7. 9. 13.
15	Website & Landing Page, Retargeting, Case Studies	Website, Affiliate, SEO&SEM	1. 2. 5. 6. 9.
16	A/B Testing, Cohort analysis, and other audience testing options with data analytics	Website, Affiliate, SEO&SEM	1. 2. 3. 13.
17	Retargeting Audience	Website, Affiliate, SEO&SEM	5. 6. 9.
18	Integrated platform options (Single sign-in login, automated content sharing)	Website, Affiliate, SEO&SEM	3. 9. 13.

Figure 5.2. (b) Macro-dynamic framework identifying Growth Drivers and Digital Marketing Strategies & Tactics for achieving Start-up Growth (authors elaboration)

19	Clickable Prototype (part of testing process/ communication)	Website, Affiliate, SEO&SEM	**1. 2. 3. 7.**
20	Traffic Data Analysis (on customer behavior) & Online Panels	Website, Affiliate, SEO&SEM	**2. 7. 13.**
21	Scheduled newsletters, Personalized Email & Keyword-based emailing	Email Marketing	**2. 5. 6. 9. 10.**
22	Surveys, polls, and pop-ups (during the whole customer journey)	Email&Social Media&Website	**1. 2. 7.**
23	Videos & Live Video Streaming	Video Marketing & Device/App	**5. 9. 12. 14. 15**
24	Emerging technologies - Augmented Reality Experiences, Blockchain NFTs	Interconnected with used digital platforms	**2. 3. 4.10 .12.**
25	AI-powered analysis and customer targeting	Interconnected with used digital platforms	**3. 5. 7. 9**

Figure 5.2. (c) Macro-dynamic framework identifying Growth Drivers and Digital Marketing Strategies & Tactics for achieving Start-up Growth (authors elaboration)

In practice, start-ups use all-in-one solutions of inbound, automated data tracking tools as HubSpot, Google Analytics, Optimizer, and other platforms and CRM software. Still, with the full data points analysis of the customer journey provided by the tools, the question which remains is how the team understands and uses the data and converts it into value.

Thus, as the product-market fit and its optimization through digital marketing is the main focus of the second part of this research, the learnings from the Macro-dynamic framework have been used for DM_Optima design. Moreover, growth drivers of Internal Process Development and Culture & Team are added as complementary aspects of the start-up's ability to define product-market fit through digital marketing.

Besides the inputs for the DM_Optima, the Macrodynamic framework is made to simply guide start-ups when it's necessary to tackle challenges while turning them into growth drivers. From a strategic and practical point, the framework helps the start-up identify the growth drivers and offers the solution of several digital marketing strategies & tactics which can be utilized to directly impact the identified growth driver and challenge.

5.2. Digital Marketing Performance Measurement

Based on the metrics systems, the data can be tracked and classified which automatically leads to evaluation potential. As digital marketing tools and tactics include predefined metrics systems (depending on the used platforms), the data analytics are predominantly evaluating the activities within digital marketing usage. Connecting data analytics with start-up performance metrics (such as retention rate, number of qualified leads) encompasses a performance tracking system. Being that this system is initially based on digital marketing analytics, it becomes a uniquely designed metric system used by each start-up.

As organization's efforts to use marketing metrics systems cannot be understood without considering the logic behind the chosen metrics, the processing of metrics data, and the organizational context surrounding the use of the system (Järvinen & Karjaluoto, 2015), this work will use the logics and points of digital marketing performance metrics systems to design the optimization framework for start-up digital marketing performance measurement.

5.3. DM_Optima Components Design

Based on the inputs from the Macro-dynamic framework, product-market fit, and digital marketing performance measurement, the DM_Optima framework components have been characterized and designed. In Table 5.1., the proposed components & subcomponent descriptions and designs are shown.

When integrated with the main start-up activities through digital marketing, the performance measurement becomes an entry point for using digital marketing practices and identifying their impact and potential enhancement of the overall process.

Upon recognizing the process of product-market fit and digital marketing (along with strategies and metrics) as interconnected system components of formulating the right fit, the outcome of this connection also depends on internal team capabilities to interpret and use the data.

Table 5.1. DM_Optima framework Components Design (authors elaboration) (1/2)

Component	Design Principle	Implications for DM_Optima Framework	Proposed Framework SubComponents
Digital Experimentation	Digital experiments should be easily replicated by team members, while generating usable and comparable data, and seen as an experimentation process with an established learning process (Bland & Osterwalder, 2020) (Melegati et al., 2020) (Silva et al., 2020); Actionable, accessible, and auditable, characterize a starting point of tracking start-up idea evolvement (Ries et al., 2011); For pre-product-market fit software start-ups the challenges are to systematically identify the riskiest assumptions, describe the assumptions in a testable way (metrics), and have practical knowledge on how to efficiently test assumptions through experiments (Gutbrod et al., 2017);	Testing hypotheses and enabling the build-measure-learn cycle marks the crucial steps in all digital experiments. The framework is focused on supporting and recognizing the level of digital marketing usage and benefits from digital experimentation.	• Developing hypotheses, defining problems & opportunities • Identification of key metrics (e.g. Retention rate & Conversion rate)
Digital Marketing Analytics Alignment	KPIs companies should analyze conversion rate, goals conversion rate, type of users, type of sources, keywords/traffic of non-branded keywords, and keyword ranking (Saura et al., 2017) Decision-making involving market and technology aspects is supported by performance measurement (Bekhradi, 2018);	The crucial importance of aligning the technology and enabling the internal feedback system to collect, evaluate and use the insights for the collected feedback. Using analytics and metrics towards building and managing a digital marketing analytics system that enables insights based on the data from digital platforms.	• Enabling environment for Performance measurement and process tracking • Designing of the right KPIs • CRM capability

Table 5.1. DM_Optima framework Components Design (authors elaboration) (2/2)

Component	Design Principle	Implications for DM_Optima Framework	Proposed Framework SubComponents
Data Integration & Interpretation	The proactive and continuous process of designing/improving products based on the insights collected from existing customers can initiate a higher ROI than acquiring new users and content design improvement (S. Y. Ho, 2016); (Tripathi et al., 2019); Continuous development and innovation as a start-up's primary objectives in strategic development, with innovations supported by technology and upgrades (Kannan Dinesh et al., 2019); Sales managers actively use sales analytics tools and forecasting data to leverage and make strategic business decisions for the next year (*HubSpot Research Global Sales Enablement Survey*, 2020);	The planned activity of customer feedback collection through systematic actions of identifying, collecting, and evaluating customer feedback with analytics-supported actions. Start-up's capability to have an organized process of resource management.	• Systematic Feedback • Technology and data analytics used from digital marketing tools • Emerging technologies • Reporting practices
Internal capacities & Culture	Internal resources are essential for identifying the requirements of the product idea for MVP development (Tripathi et al., 2019). The team's collaboration capabilities are the essential ability to guide, organize operations, and foster the creativity and knowledge of each team member within the context of the start-up (Lopez Hernandez et al., 2018); Social analytics tools need to generate performance reports, impacting the success of SMM(Keegan & Rowley, 2017) To prevent unnecessary risks such as the loss of information on customer needs, creating a social media marketing strategy requires a higher level of commitment and a strategically clear vision of the SMM role within the company (Buratti et al., 2018).	Focus on organized and skilled teams in start-ups, along with the analytics knowledge integration in operations, resulting in supportive enablement of correct digital marketing performance measurement optimization.	• Organizational culture • Team & Skills development

As the bases for performance analysis, this framework will use web analytics, social media other distinctive metrics identified through digital experimentation, product-market fit, and testing activities. Within this scope, the framework will follow the digital marketing performance measurement proposed by (Järvinen & Karjaluoto, 2015) by analyzing how start-ups define metrics, the process of turning data into insights, and the organizational context of the metrics used. The Figure 5.3. and Table 5.2. present the summary of DM_Optima Components and

Subcomponents (with a notion that some of the subcomponents have been simplified and merged from the *Proposed Framework SubComponents* of the previous table):

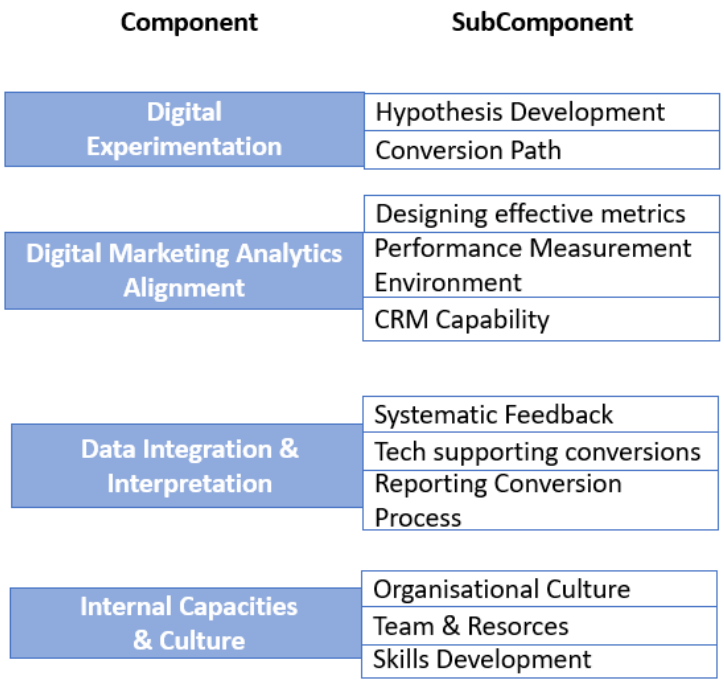


Figure 5.3. The DM_Optima Framework_Components & Subcomponents (authors elaboration)

Several subcomponents of this model were also designed in coherence with Data Analytics Maturity Model (Stéphane Hamel, 2018b) exemplifying how digital analytics agility enforces a data-informed culture. The focus of the framework is to establish the start-up's ability to design and use digital marketing analytics and processes of performance measurement, leading to higher product-market fit optimization. In this perspective, the content, process, and context of digital performance measurement are viewed through components corresponding start-up environment and digital marketing usage. Each subcomponent of DM_Optima has several levels of development and it's designed with the characteristics of a maturity model.

Table 5.2. List of DM_Optima Subcomponents with Description

Subcomponent	Description
Hypothesis development	Start-ups practices and methodologies on hypothesis development as foundations of testing and experimentation process
Conversion Path	Identifying and tracking indicators on how the conversion of customers is made (acquisition sales funnel)
Designing effective metrics	Developing an effective metric system throughout the overall start-up setting
Performance Measurement Environment	Development of practices and processes for performance measurement within the start-u team
CRM Capability	Usage of CRM for insights based on start-up activities (internal, sales, marketing, etc).
Systematic Feedback	Systematic structured customer feedback analysis enabling direct insights into customers
Technologies used to support data conversions	Technologies and data platforms used to analyze data analytics conversion to insights - from web analytics, and social media, to more advanced options of predictive analytics (AI/ML).
Reporting Conversion Process	Senior management establishes a continuous process of experimentation and reporting on digital marketing activities.
Organisational Culture	Cooperations and communication practices between different departments on digital marketing activities (eg. Frequency of meetings and communication between marketing and sales departments).
Team and Resources	Start-up skills and staff availability for interpreting data from digital marketing platforms (e.g. Marketing professionals, data analysts)
Skills development	Practices focused on continuous team education on digital marketing, creativity, and connecting subjects.

These kinds of models are intuitive, and the value of each level is also easily quantified in the DM_Optima Scorecard. Each level describes the process, practices start-ups can use through digital marketing performance measurement and optimize towards a higher level of development (Figure 5.4.).

Code	SubComponent	Level	Description
Digital Experimentation			
DX_1	Hypothesis development	0	No processes or methodologies developed
		1	Some repeatable processes are developed, but not a methodology
		2	There is a specifically developed methodology, which is documented and followed
		3	There is a specifically developed and proven methodology (involving concepts of testing of hypothesis (ex. Lean Methodology, and for digital analytics Agile)
		4	Agile and business analysis are used as concepts and represent an integral part of start-ups testing & digital analytics practice
		5	On top of agile and business analysis, the start-up has adopted a continuous testing improvement philosophy

Figure 5.4. The DM_Optima Subcomponent Example

Thus, the key aspect of this framework is the identification and optimization of the components identified through product-market fit and digital marketing measurement performance.

5.4. Summary

The DM_Optima framework is developed through a combination of literature review and industry insights, with a goal to optimize the product-market fit process using digital marketing. It focuses on measuring the performance of digital marketing in its impact on start-up operations. The framework aligns performance measurement activities with a start-up's key activity, which is achieving product-market fit. The proposed components and subcomponents of the framework also highlight the importance of internal capacities and culture as complementary drivers in the process.

6. MULTIPLE CASE STUDY METHODOLOGY

6.1. Collection of Literature Review

The theoretical basis for this research work is based on three complementary Research Areas as presented in Figure 6.1. To identify the characteristics and components of the proposed framework, a literature review of all these three complementary areas was performed.

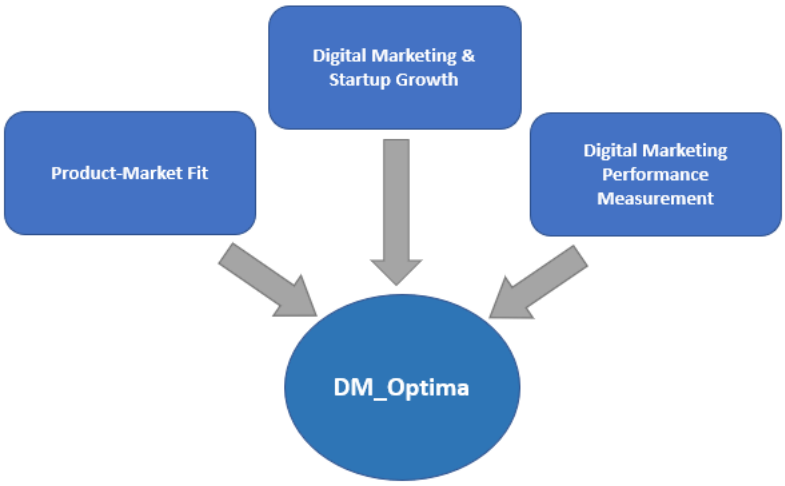


Figure 6.1. Literature areas connected to the DM_Optima development

The literature reviewed on Start-ups and Digital Marketing provides an overview of key activities that influence start-up growth through digital marketing. Product-market Fit and experimentation on digital marketing channels explore the theoretical relationships of how the Fit can be made and measured, along with which internal processes need to be designed and

measured. The Digital Marketing performance measurement exploration through existing literature provided this work with theoretical and contextual frameworks which are used to track, measure and interpret digital marketing analytics. This investigation focused on understanding to context of internal performance measurement start-ups design while defining product-market fit. Thus, external interactions and the process of performance measurement were not explored in this research.

This research connects Digital marketing, Product-Market-Fit, and Performance Measurement, and based on this connection the DM_Optima framework was made. To test the framework's applicability and validity, based on the conclusions derived from the literature review and the contextual points of this research, a multiple case study investigation was chosen as an appropriate methodology.

6.2. Research Methodology and Design

The multiple-case study method was chosen for this research because it allows for an examination of multiple cases within a specific context (Yin., 2014). As investigated through the literature review, the body of knowledge needs to be expanded by understanding organizational processes for data analytics interpretation (Silva et al., 2020) and making meaningful insights based on data (Dwivedi et al., 2020) as part of functional activities & processes in a start-up context. How to obtain product-market fit and do practical testing through experiments (Gutbrod et al., 2017), should be investigated from various perspectives in order to identify common themes and get deeper insights. Moreover, start-ups are also in a unique position to create digital analytics and performance measurement practices as there are no (or few) existing processes and fixed routines burdening the process (Stéphane Hamel, 2018). To identify the implementation of this contextual activity, it needs to be understood from the points of different start-up settings and how start-ups of different maturity levels design this process. Therefore, the multiple case study method is particularly relevant as it allows for an in-depth examination of these concepts in different settings, which can provide valuable insights for future research and practice (Yin.,

2014). Additionally, the use of multiple cases allows for the identification of common patterns and themes, which can then be used to inform on current industry practices involving start-up context. Overall, the multiple case study method provides a valuable approach for gaining a comprehensive understanding of a complex phenomenon in an unexplored connected context of start-ups, product-market fit and digital marketing performance measurement.

In this multiple case study research, nine case studies have been investigated. To have a robust and comparable analysis, start-ups of different maturity were chosen for the research. From nine start-ups, the maturity ranges from early-stage to mature ones, precisely to establish what kind of different practises are being done within different levels from the performance measurement perspective, and what are differences in terms of digital marketing usage for achieving and maintaining the product-market fit. One of the case studies is classified as a company. However, this company also has start-up elements particularly interesting to the scope of research (by using performance marketing to maintain the product-market fit), and represents a situation of a scale-up (as entering new markets is their goal). For these reasons, it was highly important to investigate the behavior of this company and make comparisons within the group of the selected start-ups. Moreover, as this company extensively uses digital marketing, it represents a high-performance company in terms of how the design of data interpretation is made, but still acting as a start-up for some of the activities (client development, designing a data-driven environment for new/existing products) that also match the challenges this group of start-ups face. Therefore, with all the mentioned mixture of characteristics, it was found to be pivotal to include this company as a case study.

Primarily, each case study will be analyzed individually. To identify the common patterns and themes, cross-case analysis was used as a methodological tool for the detailed analysis of the research questions and identification of patterns and themes. Furthermore, as cross-case analysis offers a perspective of diagnostics for the case components in question, this tool was also chosen as it will support the Scorecard design at the end of the research. Balanced Scorecard was used as

a performance metric tool for framework components and provided necessary analysis of the start-up's ability to use digital marketing performance measurement for product-market fit.

6.3. Research Validity and Reliability

To ensure this case study research has a qualitative aspect and is valid for the chosen context of research, this methodology follows (Yin., 2014) criteria on validity and reliability. The case study protocol was made to ensure the reliability of the case studies. Along with the protocol, the pilot case study was also used to support the data collection and interview testing, and design.

As this research involves multiple case studies, the replication logic was applied, as well as the identification of specific common points in the data analysis. To ensure the construct validity, multiple sources of evidence (secondary data on start-ups gathered through digital marketing channels) were used in data collection. To ensure the data accuracy, the research used cross-referencing where data was obtained from two sources and compared to check and collect accurate data.

The case study database was also developed for data collection and data analysis process. To minimize bias in segments of data collection and analysis, the thesis author worked with one more researcher whose area of investigation also includes the research areas of this study.

6.4. Selection of the Case Studies

As start-ups are the major point of this research, in order to have a reliable context and set of components influencing development in one market, only Portuguese start-ups have been used in the case study (Table 6.1. identifies five criteria used in case study selection). The second criterion was that the nature of the start-up activity had to have a base as a digital business, or a key component of the business model is developed through the digital context.

Table 6.1. Case study Criteria for Start-ups Participation

Case study Criteria for Start-ups Participation	
1	Portuguese start-ups
2	Digital Businesses
3	High level of digital marketing usage
4	Different maturity levels
5	Type of Business Model (B2B; B2C; B2G; B2B2C)

The maturity of the start-ups is made within the context of product-market fit development as suggested by (Gupta et al., 2020), and connected to the start-up maturity levels and digital marketing growth potentials (presented in the second chapter of this work). Based on these inputs, the start-ups are grouped into the next 4 categories:

- Early-stage (product and market not yet defined, focus on technical functions, lack of knowledge diffusion and regular practices)
- Stabilization (Product is still not finalized, revenue is generated, but income needs to be stabilized. The customer niche is discovered, and the customer base is still growing. Additional features are being made and resources still need to be fully aligned)
- Start-up (Revenue is stabilized (some streams of fully), a start-up in a position to attract investments, scaling/plans to scale to new markets; Resources and operational processes getting fully aligned)
- Scaleup & Maturity (Start-up is already mature with expanded operations in other markets/regions, resources functional, and full alignment between data, marketing, sales, and other sections. Experienced team and leadership in place).

The type of business model was also used as a criterion to identify the processes of digital performance measurement within a different type of categorization. Business models can be categorized into different types: B2B (business-to-business), B2C (business-to-consumer) models, B2B2C (business-to-business-to-consumer) and B2G (business-to-government). B2B models involve companies selling products or services to other businesses, while B2C models involve

companies selling directly to consumers. In B2G companies sell products and services to governmental organizations, and in B2B2C a company acts as an intermediary between other businesses and consumers. This type of model is different from B2B and B2C models in that it involves the company buying products or services from one or more businesses and reselling them to consumers.

The selected start-ups which participated in this study complied with all of the mentioned criteria. As the researcher is currently working in a start-up incubator, the start-ups from this ecosystem were invited to join and participate in this research (except for two start-ups outside of the incubator ecosystem). The incubator has an internal system of validating the start-up status and maturity, which also helped the researcher to narrow down the number and invite start-ups that are fully aligned with the study objectives.

6.5. Case Study Research Objectives

The case study research objectives of this work are:

- To identify how digital marketing usage can support start-ups in product-market fit activities
- Understand how internal resources and processes impact optimization points of digital marketing performance measurement and product-market fit
- To identify and establish the level of the digital marketing performance ability for start-ups based on digital marketing usage and their maturity levels

6.6. Data Collection

A semi-structured interview was developed and used for the case study data collection. The interviews aimed to gather deeper insights into how digital marketing channels and strategies start-ups are used to influence the product-market fit, and overall aspects of the digital

marketing performance measurement. At the beginning of the interview, the major terms of the study ("product-market fit" and "digital marketing performance measurement") have been introduced to the participants. Although the interviewees were mostly familiarised with the terms, this was done to ensure that all of the participants were fully aware and understood how the study objectives are connected to the main terms.

Firstly, the participants were asked to describe their start-up and product. The Questionnaire was also used at the beginning of the interview to collect the demographic data (presented in the Appendix). Also, multiple choice questions were asked to collect insights on the following points: hypothesis development, technologies, metrics and feedback process, organizational culture & documentation, and senior management involvement. The construct of the question used for start-up description and Questionnaire questions related to data analytics were adapted from (Berg et al., 2018). The next set of interview questions was focused specifically on: used digital marketing channels, product-market fit defining, the process of designing and running experiments/tests with digital marketing, effective digital marketing strategies, tools, and tactics influencing product-market fit, main metrics/KPIs followed, software & tools used for data analytics, designing metrics & team responsibilities, internal capacities and resources, frequency of internal communication between teams, data interpretation process, the structure of marketing team, existing educational policies & subjects.

Before the research started, a case study protocol was made. Two pilot case studies were made to test the methodology, questions, approach, and data reliability (one of the pilot case studies was included in data analysis). To ensure that valid, reliable, and correct data (and processes) were provided, interviewees were either CEOs, Founders, or Marketing Managers with insight into business and marketing-related aspects of their start-ups. In total, eleven interviews (nine face-to-face and two video calls) with eleven professionals from nine different start-ups were conducted. With 2 start-ups, two additional interviews (with CEO and Marketing Manager) were conducted to complement the questions which could not be answered in the first interview.

6.7. Data Analysis

Based on the research methodology and criteria established for this case study, the start-ups participating in this study and their profiles are presented in Table 6.2. Each interview lasted between 50 and 120 minutes and all the case studies have been recorded and transcribed. The recordings were quickly transcribed after each interview to minimize the potential for bias.

Table 6.2. Case study profiles - Start-ups & Interviewee

CS Number	Start-up Maturity	Start-up Age: (in yours/months)	Solution type:	Business Sector:	Number of employees	Interviewee Position:	Interviewee Start-up experience:
1	Start-up	9 years	Platforms	B2B, B2G	6	CEO	9 years
2	Stabilization	2 years	ICT	B2B	52 (volunteers)	Vice-president	1 year 9 months
3	Stabilization	2 years	ICT	B2B	52 (volunteers)	Marketing Manager	1 year 9 months
4	Stabilization	2 years	Business development services	B2B	3	CoFounder and Partnership Manager	2 years
5	Early-stage	1 month	Digital marketing services	B2B	1	Partner	1 year
6	Stabilization	3 years	Recruitment + Digital Solutions	B2B2C	5 internal, 16 external	CEO + business development	9 years
7	Early-stage	10 months	Sports Web platform/app	B2B2C	2	Founder	10 months
8	Early-stage	6 months	Content Monetisation Platform	B2B	4	CEO	7 years
9	Start-ups	6 years	Software development	B2B2C	54	Marketing and Communications Manager	3 years
10	Start-ups	6 years	Software development	B2B2C	54	Founder & CEO	3 years
11	Scaleup/ Maturity	14 years	Healthcare	B2C	500+	Head of Performance Marketing	5 years

For the data analysis process of this work, firstly the data repository from each case study was made. The initial coding developed through research was expanded and rationalized based on the learnings through case studies. These data sets were then analyzed to identify the segments relating to the research questions and themes. The next step, coding each case study content was done on the open-source platform for qualitative data analysis – Taguette (https://www.taguette.org/). The coding system was previously developed and used directly in the software (in form of tags). Afterward, for each case study, an individualized report was created.

The Cross-case analysis was implemented to make the connections and correlations with the unit of the analyses for each case study.

6.8. DM_Optima Scorecard Weighting – AHP & Pairwise Comparison Method

The findings from this study will be presented in two ways, the individual analysis and interpretation of digital marketing impact on PMF activities (through descriptive analysis), and in form of a DM_Optima Balanced Scorecard. As digital marketing performance is encompassing several operational sources of data and builds up on the performance measurement systems (Lohman et al., 2004), to quantify, and evaluate the digital marketing performance measurement and its impact on PMF, a Balanced Scorecard for each start-up is designed. The inputs for the Scorecard which were used followed the same principles and component design established with digital marketing performance for start-ups described in the previous section. For the Balanced Scorecard quantifiable results, each value needs to be weighted through one of the existing weighting methods.

The overall process of designing and determining the weighing process of the DM_Optima Scorecards involves the ranking and weighting values of 15 subcomponents as an interrelated group. As the ranking and final weighting values need to be established for each subcomponent, the pairwise Analytic Hierarchy Process and the pairwise comparison of each subcomponent was

used. The Analytic Hierarchy Process (AHP) is a structured technique for organizing and analyzing complex decisions, in which each component is given a relative importance weight by utilizing a set of pairwise comparison matrices (T. L. Saaty, 1980). The AHP method is used to evaluate alternatives from the decision makers aspect, within the framework of determined main and sub-criteria, to solve the problems that can be hierarchically structured for the specified target (Saaty, 1990).

With the AHP method, the complex problem is structured into main criteria and sub-criteria, making a pairwise comparison of these criteria, deriving their weights, and prioritizing them. This mathematical method was chosen for the comparison of the DM_Optima subcomponents as it can be used with research from tangible to non-tangible criteria, creates understandable and straightforward results, and makes foundations for decision-making in complex problems with several criteria and situations (Harputlugil, 2018). In this work, this method is used to make weights for the DM_Optima subcomponents, in which 15 subcomponents are seen as criteria. Criteria are placed in the decision matrix in 2 axis (Figure 6.2. - Axis j and I).

i / *j*	Criteria 1	Criteria 2	Criteria 3	Criteria 4	.....	Criteria n
Criteria 1	1	i_1j_2	i_1j_3	i_1j_4	...	i_1j_n
Criteria 2	i_2j_1	1	i_2j_3	i_2j_4	...	i_2j_n
Criteria 3	i_3j_1	i_3j_2	1	i_3j_4	...	i_3j_n
Criteria 4	i_4j_1	i_4j_2	i_4j_3	1	...	i_4j_n
.....	...	...	...	...	...	...
Criteria n	i_nj_1	i_nj_2	i_nj_3	i_nj_4	...	$i_nj_n=1$
i_aj_b : (a=1, ..., n; b=1,...., n)= Values						

Figure 6.2. Definitions of pairwise comparison numerical scales of main and sub-criterion

Pairwise comparison judgments are placed in vertical and horizontal columns in the decision matrix. To make the comparisons between the criteria, the questions and statements for pairwise comparisons should be expressed clearly. The evaluation scales in the table proposed for pairwise comparisons are between the numbers 1 to 9. In a situation where two measures are equally important, number 1 signifying equal importance is used, while numbers 3-5-7-9 represent increasing importance. Numbers 2-4-6-8 are also used for intermediate evaluations (Figure 6.3.). The numbers used are not used as numerical values but are used to define the significance levels of the metrics relative to each other in pairwise comparisons.

Values ($i_{a}j_{b}$; $k_{c}l_{d}$)	Explanation
1	Criteria *i and* Criteria *j* are of **equal** importance
3	Criteria *i* is **weakly** more important than Criteria *j*
5	Criteria *i* is **strongly** more important than Criteria *j*
7	Criteria *i* is **very strongly** more important than Criteria *j*
9	Criteria *i* is a**bsolutely** more important than Criteria *j*
2,4,6,8	Intermediate Values
a, b= (1,2,3, ..., n = number of criteria) c, d= (1,2,3, ..., n = number of alternatives)	

Figure 6.3. Definitions of pairwise comparison numerical scales (Saaty, 1980) and (Harputlugil, 2018)

All pairwise comparison matrices have two premises: The diagonal values in each matrix are equal to 1 and all matrix values are reciprocal (iajb = 1 / ibja ; kcld = 1/kdlc). Each matrix represents a vector value, based on decision-making on the compared subcomponents done by evaluators. A vector refers to a one-dimensional array of numbers that are used to represent the relative importance of the different criteria or alternatives in the decision-making process. The vector of the first comparison matrix made should be normalized and, as such, it becomes the vector of criteria priorities with respect to the goal (Figure 6.4.).

The AHP allows decision-makers to derive ratio scale priority or weights from the pair-wise comparison matrices. The priorities or the priority vector for every set in a level is estimated by using the prioritization method such as the eigenvector method, additive normalization method, or geometric mean method. The purpose is to attain the overall relative weights of the alternatives that reflect the overall importance of each alternative, and in the end, arrive at one calculated priority for each element (in this case subcomponent). Finally, each AHP calculation needs to contain consistency. Consistency ratio (CR) defines if the values for each matrix have been correctly inputted and calculated. If the CR value is less than 0,10 the evaluation is considered to be consistent, if not, the evaluation should be repeated until it arrives at a value less than 0,10.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	1	4.00	4.00	8.00	7.00	4.00	4.00	7.00	7.00	7.00	4.00	4.00	4.00	7.00	5.00
2	0.25	1	4.00	8.00	1.00	4.00	1.00	7.00	7.00	7.00	1.00	4.00	4.00	4.00	4.00
3	0.25	0.25	1	7.00	2.00	7.00	1.00	4.00	7.00	3.00	4.00	1.00	4.00	6.00	4.00
4	0.12	0.12	0.14	1	0.50	1.00	1.00	4.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
5	0.14	1.00	0.50	2.00	1	4.00	1.00	1.00	4.00	3.00	4.00	4.00	1.00	4.00	4.00
6	0.25	0.25	0.14	1.00	0.25	1	1.00	3.00	4.00	1.00	1.00	1.00	1.00	4.00	1.00
7	0.25	1.00	1.00	1.00	1.00	1.00	1	4.00	1.00	1.00	1.00	1.00	1.00	1.00	4.00
8	0.14	0.14	0.25	0.25	1.00	0.33	0.25	1	1.00	1.00	1.00	1.00	1.00	1.00	1.00
9	0.14	0.14	0.14	1.00	0.25	0.25	1.00	1.00	1	1.00	1.00	1.00	1.00	2.00	1.00
10	0.14	0.14	0.33	1.00	0.33	1.00	1.00	1.00	1.00	1	1.00	1.00	1.00	2.00	1.00
11	0.25	1.00	0.25	1.00	0.25	1.00	1.00	1.00	1.00	1.00	1	1.00	4.00	4.00	4.00
12	0.25	0.25	1.00	1.00	0.25	1.00	1.00	1.00	1.00	1.00	1.00	1	2.00	4.00	4.00
13	0.25	0.25	0.25	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.25	0.50	1	4.00	4.00
14	0.14	0.25	0.17	1.00	0.25	0.25	1.00	1.00	0.50	0.50	0.25	0.25	0.25	1	1.00
15	0.20	0.25	0.25	1.00	0.25	1.00	0.25	1.00	1.00	1.00	0.25	0.25	0.25	1.00	1

Figure 6.4. Relative importance pairwise comparison matrix from AHP software

Within the scope of this research, evaluators who had participated in the AHP evaluation system are qualified industry experts and practitioners from the start-up ecosystem and digital marketing.

Table 6.3. Profiles of Evaluators

No	Evaluator Position(s)	Background	Experience	Area of Expertise
1	Founder; Digital Marketing Professional	Digital Marketing Report Analysis; Data Analytics; Sales;	7+ years	Start-ups; Digital Marketing; Data Analytics.
2	Cofounder & Product Development	E-commerce; SaaS; Start-up Mentor; EdTech	7+ years	Product Development; Start-ups; Digital Business.
3	Ecosystem Facilitator: Senior Manager	Business Development; Start-up Mentor; Performance Measurement	15+ years	Start-ups; Companies; Start-up Ecosystem Development.
4	Head of Data Science and AI	Data analytics; Innovation	20+ years	AI evangelist; Start-ups; CX, media platforms, people analytics.
5	Cofounder & Product Development	Web development; Data Analytics; Business Development; SaaS;	7+ years	Product Development; Start-ups; Digital Business; IT
6	Cofounder; Digital Business Development	Digital marketing & branding; Content creation; Digital Content Monetisation;	12+ years	Digital Business; Game publishing
7	Cofounder; Digital Business Sales & Marketing, IT.	Digital Marketing; Data analytics; Reporting & Insights; Start-up Mentor	15+ years	Digital Business; Marketing & Sales; Consultancy
8	Innovation Facilitator	CoFounder; Sales; Start-up Mentor.	10+ years	Innovation; Digital business ; Circular Economy; Hospitality
9	Founder; CEO	Web-development; Data Analytics; Reporting; Sales & Marketing	10+ years	Digital Business; ICT;
10	Digital Transformation Manager	Data Analytics; Strategy Management	11+ years	Digital Business; Research; Data Analytics.

All the evaluators had at least 7+ years of industry experience, and are start-up founders, digital marketing experts, or ecosystem facilitators with a proven record of developing products, founding start-ups, experts in digital marketing, and/or background in data analytics (Table 6.3.).

In total, 10 evaluators made the comparisons and based on the results, the pairwise comparison was made. The evaluators were given AHP Questionnaire to mark the comparisons between 15 components of the DM_Opitma framework (Figure 6.5.).

Component	Extremely Important		Much more Important		More Important	Moderate Importance		Weak or Slight Importance	Equally Important	Component
	9	8	7	6	5	4	3	2	1	PMF Indicators
	9	8	7	6	5	4	3	2	1	Designing effective metrics
	9	8	7	6	5	4	3	2	1	Process Documentation
	9	8	7	6	5	4	3	2	1	Team Involvement & KPIs
	9	8	7	6	5	4	3	2	1	Investment criteria & Budget Flexibility
	9	8	7	6	5	4	3	2	1	CRM Capability
Hypothesis development	9	8	7	6	5	4	3	2	1	Customer feedback

Figure 6.5. AHP Questionnaire used in this research (partial representation)

To make the weights based on the values, the AHP Calculation software was used. Specified criteria and sub-criteria were organized in the AHP hierarchy and the evaluation study was conducted with Business Performance Management Singapore AHP Software (https://bpmsg.com/ahp/).

This software was chosen as it is open-source software, has the automatical calculations of priorities, simultaneous consistency control, and is easy to use for non-experts. The resulting weights are based on the principal eigenvector of the decision matrix. Consistency control was done through the software and in total, for all the calculations its value was 0,094 which identifies as a proper consistency ratio (<0,10).

Table 6.4. Final Subcomponents weights

Subcomponent	Weight
Hypothesis development	0.14
PMF Indicators	0.16
Designing effective metrics	0.11
Process Documentation	0.07
Team Involvement & KPIs	0.10
Investment Criteria	0.08
CRM Capabilities	0.05
Customer Feedback	0.06
Technologies supporting data conversion	0.04
Reporting Structure	0.05
Reporting Content	0.03
Culture	0.03
Skill Set	0.04
Education	0.02
Creativity	0.02
SUM	**1.00**

The total for each priority vector in every method should be equal to 1 (which was the case for all 10 matrices in this research). The final subcomponents rates were calculated by summing and dividing the overall priorities and the number of a matrix (n=10), which also resulted in a sum of 1. The final sum values are then ranked between the subcomponents resulting in the overall ranking of importance for each component (Table 6.4.)

7. MULTIPLE CASE STUDY RESEARCH RESULTS

In conducting a multiple-case study, it is necessary to provide analysis and findings of each individual case and then draw cross-case conclusions, presented through cross-case analysis and findings (Yin., 2014).

The result of this research will be presented in two parts, individual and cross-case analysis (Figure 7.1.). Firstly, each case study will be analyzed individually on two points, the Product-market Fit with Digital Marketing Support Identification and DM_Optima ScoreCard for each case study.

Secondly, after each individual analysis and results are made, the cross-case analysis encompassing the overall conclusion for all case studies will be presented. After matching PMF activities and Digital marketing support, the cross-case study analysis will continue by mapping and analyzing how different start-up profiles (based on their maturity levels and product offering) utilize their performance measurement through DM_Optima.

Based on this mapping, Digital marketing Performance Measurement Quadrants will be designed and presented. Finally, the complete analysis of the DM_Optima Scorecard for all case studies will be presented along with the findings.

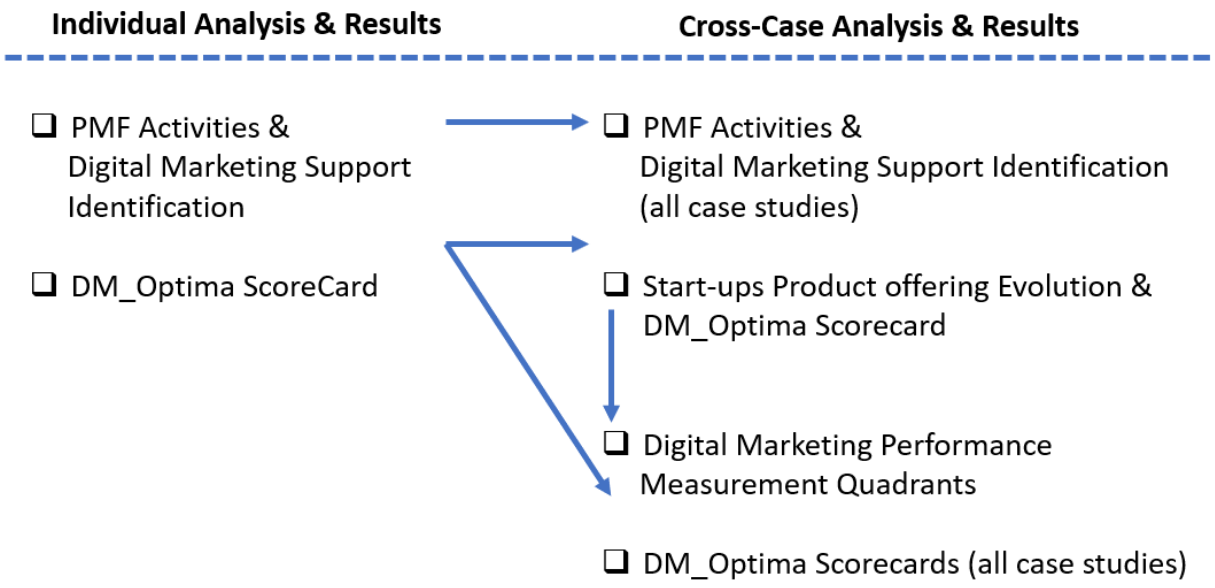


Figure 7.1. Multiple Case Study Results Presentation

7.1. Individual results for case studies

Each case study and its result will be presented within two points, in the following order:

1. Product-Market Fit Activities with Digital Marketing Support Identification

The results presentation will start with each case study start-up profile. Afterward, the table is made for each case study which indicates the used digital marketing support connected to different product-market fit activities. The product-market fit activities used for the identification are the ones established in the 3rd Chapter of this work.

2. DM_Optima Scorecard

The start-up's ability to use digital marketing performance measurement in optimizing the Prodcut-Market fit will be presented in DM_Optima Scorecard. The DM_Optima values for each component are analyzed and results are described, along with a graphic representation. Further progress indication will be given as suggested by (Stéphane Hamel, 2018b) that data-informed

culture should be achieved by focusing on a fairly similar level of maturity in subcomponents, before proceeding towards more advanced concepts.

6.10.1. Case Study 1

Product-Market Fit Activities & Digital Marketing Support Identification

The start-up A operates in the ICT industry making different solutions for governmental and non-governmental clients, on the national Portuguese market. The relationships with clients are aimed to be long-term, in which the digital solutions are designed and maintained by the start-up. The start-up is active for 9 years, and its main clients are municipalities from central and continental Portugal. The start-up is seeking for new funding as the goal is to expand the services and also enter new possible markets.

Table 7.1. Start-up Profile_A

Start-Up Profile	
Industry Type	**Information and Communication Technology**
Maturity Level	**Start-up**
Business Model and Market	**B2B2G; National**
Number of Employees	**6**
Start-up Description	Development of IT services, web, and mobile, oriented towards people, places, and the relationships that regulate the different communities. The applications are developed for clients such as municipalities, public companies, and non-governmental organizations.
Case Study Identification Number	**A**

One of the main reasons why start-up uses digital marketing is for communication & raising awareness: *"the main objective it is to speak with our clients that we exist and we do this kind of platform, we need to be present (on the market)…I need to make an output of an article every month, I need to make outputs regularly just to tell my world, e-gov world, that we exist and we do work with others."*

Continuing with the objectives, the founder also adds the importance of making space for future activities: "*the main objective is (also) to spread the word about future (products and clients) - there's a market there, and its the presence of commercial business of parishes*". In this context, as this start-up is in a more mature stage, the activities are more connected to maintaining the product-market fit and understanding the needs of existing users along with creating new target customers. From these activities, LinkedIn and Instagram are used (Table 7.2.).

Table 7.2. PMF Activities & Digital Marketing Support Identification_Start-up A

PMF Activities	Digital Marketing Support
Main Usage objectives of Digital Marketing	Client communication; Brand Building, Awareness & Promotion; Lead Generation; Market Research;
Collecting inputs from the customer base and Client Base Growth	Client webpages, social media account (mainly LinkedIn, LinkedIn groups, and Instagram); Newsletter; Facebook used only for friends & family
Market research	Competition scanning on digital channels, funding opportunities, trend tracking
Forming Value Proposition	**Non-Digital:** Stakeholder/Partners meetings; Letters/Flyers (in later stages)
Establishing the right audience channel	Testing videos as a format to launch a new product; Newsletter for one specific audience
Testing & Experimentation	Partly through videos on new services (Product Validation);
Iteration & Feedback loops	Feedback organized by CRM software (Sugar)
Product/service improvements and business tactics connected to digital marketing	New audience (with possible new services) was identified based on the CRM integration and email marketing
Analytics Software	Matomom as open source, configured by CTO
Correct usage of feedback and analytics	Biweekly team meetings, monthly reports on the DM activities
Used Metrics	Number of newsletter subscriptions; Number of new/returning customers; Website Pageviews; Article/Blog views

Secondly, the newsletters are also actively used and found to be useful as they address different audiences: "*We have different kinds of the newsletter, different kinds of audience, depends on the work we have done, we send the newsletter from for different people we have a newsletter of course for our clients*

and people that already work with us, and then we have a newsletter more open with that for other potential clients that we want to bring in". Start-up emphasized the strong usage of CRM and that within this tool while sorting the data from all digital marketing channels they got an idea of what would be the new product to provide. "*By the fact that we are organizing the information on Sugar platform by each client we achieved this kind of…epiphany, we can do service to this kind of public. I think it gave us an idea on how many clients we have, and how having information that they can participate (in a specific service)…. that kind of work we are going to do in the future …..and then you just take their emails and send the emails (through the platform)*." With these actions through email marketing (and CRM data integration) start-ups used the systematic organizing of the data to design the new service for existing and new clients. Segmentation of the audience was also done through the CRM, enabling the start-up to design product offerings based on the segment's needs. Market research is mostly used for competition scanning, new funding opportunities, and tracking the current industry trends.

DM_Optima Scorecard

Digital Experimentation. The start-up has lower levels of hypothesis development, PMF Indicators and Technology supporting data conversions. The metrics and KPIs are defined only by one activity "*The only KPI I have is to publish one article by month on the website*", and should be connected with the overall strategy. As the development of the hypothesis is on a lower level, the start-up doesn't use the option of having organized testing although has the necessary tools and team skills to organize it.

Digital Marketing Analytics. The level of digital marketing analytics lack development towards an effective metric system and need more elaboration toward planning the digital marketing activities and team influence. The start-up does benefit from the CRM and has regular meetings on sharing the analytics and results "*each team member says what they are doing what is needs difficulties and when that happens in the work*". This implies that if a start-up already is spending time on regular meetings, they can be organized in a structural way of not just sharing, but

planning activities and tests (further developing methodology on testing with hypotheses and conversions) as part of the meetings.

Table 7.3. Start-up A - DM_Optima Scorecard

Component	Code	Com Min - Max Value	Weight (per Value)	Start-up A Nominal	A - Final (with weight)	Start-up A (in % by component)
Digital Experimentation			**34.00**		**10.26**	**30.18%**
Hypothesis development	DX_1	0 – 5	14.00	2	5.60	
PMF Indicators	DX_2	0 – 4	16.00	1	4.00	
Technologies supporting data conversions	DX_3	0 – 6	4.00	1	0.66	
Digital Marketing Analytics Alignment			**24.00**		**8.76**	**36.50%**
Designing effective metrics	DMA_1	0 – 3	11.00	1	3.60	
Investment criteria & budget	DMA_2	0 - 3	8.00	1	2.66	
CRM Capability	DMA_3	0 – 2	5.00	1	2.50	
Data Interpretation Process			**24.00**		**10.66**	**44.42%**
Customer feedback structure	DI_1	0 – 3	6.00	1	2.00	
Team Involvement & KPIs	DI_2	0 – 4	10.00	2	5.00	
Team Reporting	DI_3	0 – 3	5.00	2	1.66	
Reporting Content	DI_4	0 – 3	3.00	2	2.00	
Internal Capacities & Culture			**18.00**		**6.41**	**35.61%**
Culture	IC_1	0 – 3	3.00	1	1.00	
Team & Skill set	IC_2	0 – 3	4.00	2	2.66	
Internal Process Documentation	IC_3	0 – 4	7.00	1	1.75	
Education	IC_4	0 – 4	2.00	1	0.50	
Creativity	IC_5	0 – 4	2.00	1	0.50	

Data Interpretation Process. Due to the active usage of CRM, the customer feedback structure is on the basic level of development. The need for higher developments can be indicated in the next activities - team efforts in developing the KPIs together, having a more structured content of reporting on the activities, along with budget flexibility aligned with overall business strategy reviewed and updated on regular bases.

Internal Process & Culture. This component is on a medium level of development with more investments needed in culture, staff, and overall education. As indicated by the founder, the main challenge within digital marketing and having more activities in education is time and resources:

"*when we are talking about start-ups, there are not many people here, but how do you balance that needs, information, conference etc…*", which continues to be one of the main major pain for start-ups in overall organizational terms (Oliva et al., 2019), including digital marketing.

Improving start-ups' chances of success happens with experimentation of their ideas, users, and market (Melegati et al., 2020), which is evident that this start-up partly uses with its digital marketing activities. But, to make the system more calibrated, the points of digital experimentation and data interpretation can be integrated with the behavior to do so, concretely planning and level by level developing the activities with their overall business strategy, addressing KPIs and setting the metrics for tracking the customer journey using methodology as SMART or RACE for establishing goals.

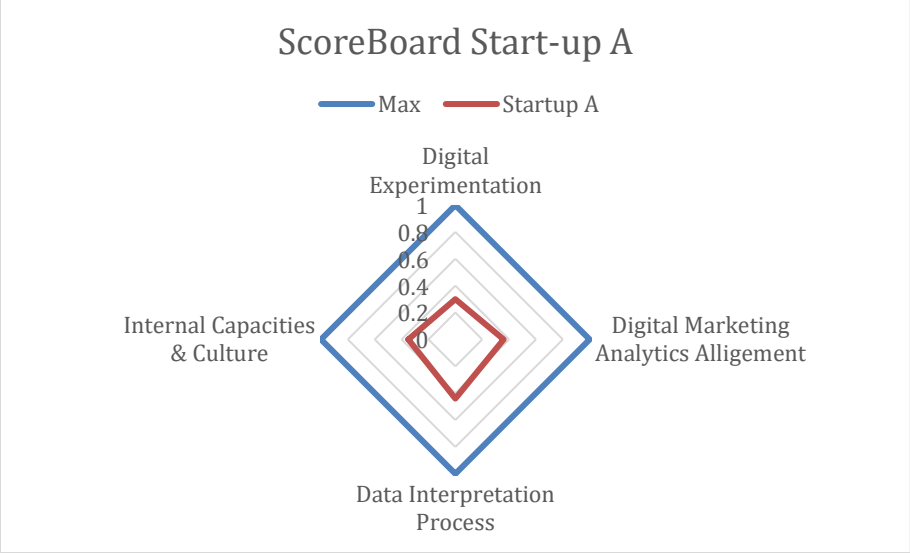


Figure 7.2. Start-up A Scorecard Graph

In the overall scope, what is indicative in Start-up A (Figure 7.2.) is that the start-up is mostly on low to medium development from the digital marketing performance and its utilization. More investments are needed in all components, but also with the already developed Analytics Alignment, the path of development can be firstly prioritized including the hypothesis development and effective metrics systems to complement the steps already done.

6.10.2. Case Study 2

Product-Market Fit Activities & Digital Marketing Support Identification

Start-up B is still on the path of entering the Stabilisation phase, with their product offering for one client segment gaining constant traction along with conversion (into paying customers) and customer growth. As it's a start-up operating as a junior enterprise and doesn't have usual employees, but rather members which are actually students willing to work in an industrial environment. Nevertheless, this enterprise has all the organizational aspects of any other company (from Board to Quality, HR, Commercial, Marketing & Operations departments). Each department has its head of operations, and the start-up has a yearly plan. Moreover, the start-up reported an 11-20 % customer increase quarterly and emphasized that they need to hire more students as their client base is growing. The client base includes companies interested in Developing Web Platforms & Applications (full stack development), Electronics & Prototyping, and Robotics & Applied Instrumentation. As the start-up is a junior enterprise, the competitive market prices are defined for each service and product provided.

Table 7.4. Start-up Profile_B

Start-Up Profile	
Industry Type	Information and Communication Technology
Maturity Level	Early-Stage
Business Model and Market	B2B; National
Number of Employees	52 (members - volunteers)
Start-up Description	The start-up's core activities are: - Full Stack Development (databases, front-end, back-end) and Mobile, - Electronics & prototyping (from prototyping to 3D printing) - Robotics & Applied Instrumentation (improving workflow, processes, and resources)
Case Study Identification Number	**B**

The main objectives of digital marketing usage are to build the brand, recruit and build trust "*the objective is to create a brand and establish (Start-up) a junior enterprise in a way that when you enter in the campus and you already know what is (the start-up) and I want to go there (in the start-up)*". Recruitment via Instagram has proven to be a good and continued practice, as is the monthly newsletter for raising awareness and brand building.

Table 7.5. PMF Activities & Digital Marketing Support Identification_Start-up B

PMF Activities	**Digital Marketing Support**
Usage objectives of Digital Marketing	Brand Awareness & Building, Recruitment, Lead generation, Trust building
Collecting inputs from the customer base and Client Base Growth	LinkedIn Accounts (clients, partners, other stakeholders) Facebook is the least-used media
Market research	Competition Scanning;
Forming Value Proposition (identifying pains & gains)	**Non-Digital:** Stakeholder/Partners meetings
Establishing the right audience channel	Monthly sharing of scientific news and technology news; Monthly Newsletter (Mailchimp)
Testing & Experimentation (including MVPs, Products/Services)	Website as a Service Portfolio;
Iteration & Feedback loops	Survey after the provided service; No CRM (currently google forms)
Product/service improvements and business tactics connected to digital marketing	Instagram is used as a recruitment tool (student engagement & recruitment)
Analytics Software	Google Analytics, Facebook business analytics
Correct usage of feedback and analytics	Monthly meetings and follow-up of activities
Used Metrics	Social media engagement (eg. likes, shares); Number of new/returning customers

Start-up emphasizes the usage of the website as a portfolio since they are a junior enterprise it supports trust building within the market "*yes in our market, I think for example if we show our website or to our audience, they can see what we are capable to do. On our website we have our portfolio*". Star-up identified two audiences while reaching out on digital media: clients and students interested in

applying to work in a start-up. LinkedIn is used for promotion and networking with other junior enterprises, companies and prospecting for clients. For building trust with students (as possibly future members), the start-up uses different tactics mainly through social media. In general terms, this start-up's use of Instagram stands out as an effective recruitment channel (and tool) through engaging with the community, and promotional and trust-building tactics.

DM_Optima Scorecard

*Digital Experimentation***.** Digital experimentation within digital channels is on a lower level. The usage is mainly limited to brand building and recruitment, which usually includes non-paid campaigns on Instagram without concrete conversions. The start-up has developed some PMF indicators (e.g. satisfaction survey after usage). Since this is more an activity, rather than a systematically developed indicator that is followed, the next step could be to further develop on PMF indicator into a specific indicator coherent with the start-up.

Digital Marketing Analytics Alignment. Start-up only uses social media engagement metrics, and KPIs for the activities are not designed coherently with other departments. From a general perspective, a start-up uses techniques of SMART goal setting (including the marketing department) but doesn't necessarily connect the KPIs from marketing and general (business, strategic) KPIs. In that sense, as there is no proper connection or tracking, the data on how marketing activities impacted overall start-up operations are lacking.

Data Interpretation Process. Start-up had some insight collected through digital channels "*we once received comments and a very helpful one that our Instagram is not really showing what we do and what we are doing… and actually this helped us um create for instance the Rewind (newsletter on start-ups monthly activities)*". But on an operational level, the feedback collected from different sources is not structured except for client surveys after the provided service. Although the team has developed the practice of reporting among management, the level of digital marketing analytics is low, the interpretation process is not centralized (no CRM, lack of collected insights) and

current data can not influence the decision-making in start-up operations from DM (besides the recruiting activity).

Table 7.6. Start-up B - DM_Optima Scorecard

Component	Code	Com Min - Max Value	Weight (per Value)	B Nominal	B - Final (with weight)	Start-up B (in % by component)
Digital Experimentation			**34.00**		**6.80**	**20.00%**
Hypothesis development	DX_1	0 – 5	14.00	1	2.80	
PMF Indicators	DX_2	0 – 4	16.00	1	4.00	
Technologies supporting data conversions	DX_3	0 – 6	4.00	0	0.00	
Digital Marketing Analytics Alignment			**24.00**		**6.26**	**26.08%**
Designing effective metrics	DMA_1	0 – 3	11.00	1	3.60	
Investment criteria & budget	DMA_2	0 - 3	8.00	1	2.66	
CRM Capability	DMA_3	0 – 2	5.00	0	0.00	
Data Interpretation Process			**24.00**	0	**3.66**	**15.25%**
Customer feedback structure	DI_1	0 – 3	6.00	1	2.00	
Team Involvement & KPIs	DI_2	0 – 4	10.00	0	0.00	
Team Reporting	DI_3	0 – 3	5.00	1	1.66	
Reporting Content	DI_4	0 – 3	3.00	0	0.00	
Internal Capacities & Culture			**18.00**	0	**5.58**	**31.00%**
Culture	IC_1	0 – 3	3.00	1	1.00	
Team & Skill set	IC_2	0 – 3	4.00	1	1.33	
Internal Process Documentation	IC_3	0 – 4	7.00	1	1.75	
Education	IC_4	0 – 4	2.00	2	1.00	
Creativity	IC_5	0 – 4	2.00	1	0.50	

Internal Capacities & Culture. This component is the most developed one for Start-up B . Interestingly, as the junior enterprise has new members joining each year and graduates leaving the enterprise, the alumni generations educate current members on different subjects, including practices and software connected to digital marketing (e.g. Adobe Premier, WordPress etc). This signalizes that education is an already existing practice (done ad hoc) and can be more structured towards planned education on subjects connected to data analytics, creativity and strategic organizational planning.

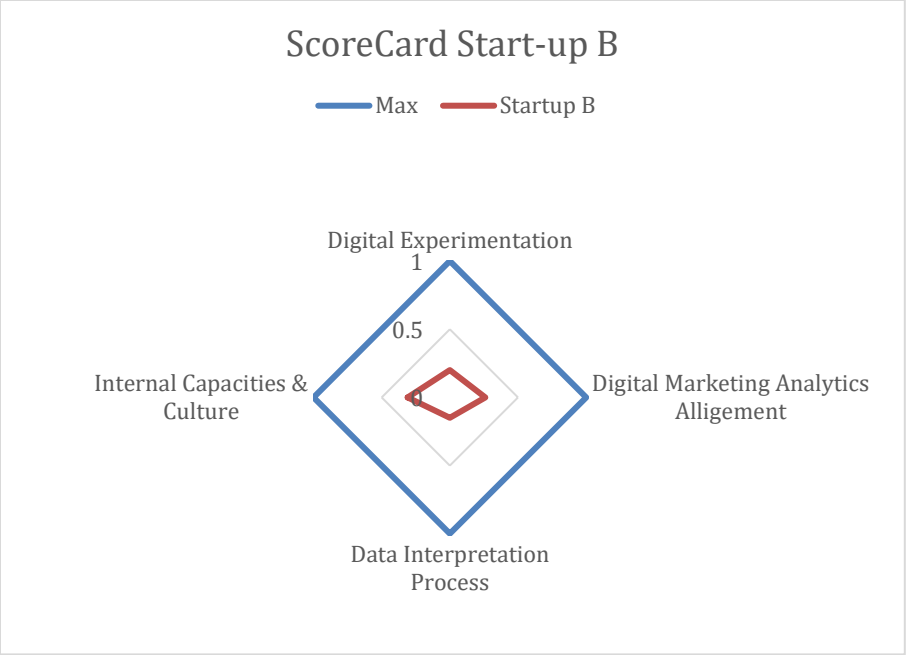


Figure 7.3. Start-up B Scorecard Graph

In the overall scope, the performance measurement and ability to impact PMF from digital marketing is on the lower levels (Figure 7.3.). Start-up capitalizes on some subcomponents, but higher interconnections between marketing and other departments, metrics alignment, and interpretation process can boost performance agility aspects.

6.10.3. Case Study 3

Product-Market Fit Activities & Digital Marketing Identification

Start-up C is in a Stabilisation stage as reported to have constant customer growth, and established service with slow revenue growth. Start-up has been founded 2 years ago by 3 founders of different backgrounds (Engineering, Business & Management). Services of business and marketing development are provided to B2B clients on national and international levels, with a current budget allocation for digital marketing of over 40 percent.

Table 7.7. Start-up Profile_C

Start-Up Profile	
Industry Type	**Business & Marketing Development**
Maturity Level	**Stabilisation**
Business Model and Market	B2B; National and International
Number of Employees	3
Start-up Description	Business & Marketing development start-up founded by a multidisciplinary background team. Core services are focused on strategizing and executing in business, marketing, lead generation, internationalization, sales, and negotiation. The client base ranges from start-ups to corporate clients.
Case Study Identification Number	**C**

The main objectives of digital marketing usage are to build the brand, trust, and reach new markets: "*It's funny to see that if we work a little bit, if you do an ad for Dubai or European union, next month the results and the demographic from the visitors range a lot and we work on that and that's the thing that we are trying to understand*". In the context of defining the market, the data from the ads is used to fine-tune the audience and understand the behavior which leads to specific customer segments being defined (Table 7.8. - complete list of DM usage for PMF activities). This start-up also mentioned that their digital marketing channels are used as a portfolio for future and current clients. When it comes to using other digital platforms, the start-up is active on review platforms such as Clutch (B2B review platform for companies with ratings provided by previous clients).

The team uses digital marketing channels in their core services while designing the marketing plan or the business plan for the client, especially when researching the competition. Testing is frequently done, on the websites and Facebook, A B testing is used but the problem they report is a lack of time and lack o followers to test different options: *" that's the thing it's always the same problem, we don't have a lot of time and a lot of followers to test and have a good result but… even though, we use them to understand the behavior of our followers and the people that visit the profile of the website, and also to test the technology or the app, to test how it works what we can do differently because there's a*

lot of different things that you can do on a Facebook ad". The test results are regularly communicated to the entire team and discussed together for further decision-making.

Table 7.8. PMF Activities & Digital Marketing Support Identification_Start-up C

PMF Activities	Digital Marketing Support
Usage objectives of Digital Marketing	Brand awareness, Building trust (portfolio generation), lead generation, Internationalization
Collecting inputs from the customer base and Client Base Growth	LinkedIn, Instagram, Facebook (clients, partners); Prospecting for companies (followed by personalized emails)
Market research	Competition scanning; Understanding customer behavior & profiles; Internationalization (research on new markets)
Forming Value Proposition (identifying pains & gains)	**Non-Digital:** Fairs/Pop-ups; Stakeholder/Partners meetings
Establishing the right audience channel	Personalized emails use for lead generation and as an Internationalisation tool; Technical, professional content on services;
Testing & Experimentation (including MVPs, Products/Services)	Ads: Facebook, Google, LinkedIn Instagram promotions; CTA button, AB testing
Iteration & Feedback loops	Pipedrive is used as CRM (without full functionalities)
Product/ service improvements and business tactics connected to digital marketing	Fine-tunning the audience (and corrections on monthly bases) audience; Publishing Start-up profiles on specialized sites for B2B ratings and reviews (such as. Clutch and Uplead)
Analytics Software	Google, Facebook, Instagram analytics, LinkedIn, and the Swanky analytics
Correct usage of feedback and analytics	Goal-oriented; Monthly goal check-up; Decisions backed by DM analytics reports.
Used Metrics	Social media engagement (eg. likes, shares); Website Pageviews; Total marketing spend; Referral program growth; Conversion Rate, Ads performance, Bounce rate, Average time on site

DM_Optima Scorecard

Digital Experimentation. The team uses testing through digital marketing and has established usage of these practices on basic levels. Although the lack of data is identified as a challenge for making better insights from digital marketing, the team uses experimentation to understand the audience, product variations, and potential for internationalization. The technologies supporting data conversion are currently focused on outcomes and conversion points. The next activities to boost the digital experimentation process can include a more advanced mapping of PMF indicators specific to this start-up and developing testing methodology following start-up needs.

Table 7.9. Start-up C – DM_Optima ScoreCard

Component	Code	Com Min - Max Value	Weight (per Value)	C Nominal	C - Final (with weight)	Start-up C (in % by component)
Digital Experimentation			**34.00**		**14.92**	**43.88%**
Hypothesis development	DX_1	0 – 5	14.00	2	5.60	
PMF Indicators	DX_2	0 – 4	16.00	2	8.00	
Technologies supporting data conversions	DX_3	0 – 6	4.00	2	1.32	
Digital Marketing Analytics Alignment			**24.00**		**15.02**	**62.58%**
Designing effective metrics	DMA_1	0 – 3	11.00	2	7.20	
Investment criteria & budget	DMA_2	0 - 3	8.00	2	5.32	
CRM Capability	DMA_3	0 – 2	5.00	1	2.50	
Data Interpretation Process			**24.00**		**13.16**	**54.83%**
Customer feedback structure	DI_1	0 – 3	6.00	1	2.00	
Team Involvement & KPIs	DI_2	0 – 4	10.00	3	7.50	
Team Reporting	DI_3	0 – 3	5.00	3	1.66	
Reporting Content	DI_4	0 – 3	3.00	2	2.00	
Internal Capacities & Culture			**18.00**		**9.33**	**51.83%**
Culture	IC_1	0 – 3	3.00	3	3.00	
Team & Skill set	IC_2	0 – 3	4.00	1	1.33	
Internal Process Documentation	IC_3	0 – 4	7.00	2	3.50	
Education	IC_4	0 – 4	2.00	2	1.00	
Creativity	IC_5	0 – 4	2.00	1	0.50	

Digital Marketing Analytics Alignment. The investment criteria and metrics system are currently on a medium level. Meaning that there is a basic understanding of customer journey and conversion paths, but they are not fully mapped out, along with investments not defined and without coherently planned structure. Start-up uses CRM software (Pipedrive). However, the CRM can be even more used to establish market insights and service functionalities (behaviors, needs, demographic) and further optimize their PMF.

Data Interpretation Process. This component is also on a medium level of development, and mainly lacks developed feedback structures, and more data so the analysis could offer more insights. The team regularly meets and sets organizational KPIs, and KPIs that are defined in line with business goals. With higher usage of already mentioned CRM software integration with customer journey optimization, the start-up could achieve not just higher levels of optimization, but also use this step to prepare the team and infrastructure for the introduction of predictive analytics in their system, especially as they also evolve towards new markets.

Internal Capacities & Culture. The main challenge the team has to fully utilize the DMA performance is more staff/skilled employees, and more time for education and skills development. The start-up also stipulates that education is not planned as in their case it comes with identified need: *"You know we don't have it planned this year we will do this, it something that comes with the need…I started by doing the Google course, Digital Google and then I'm always looking and if I have any doubts like in Facebook or Instagram or whatever, I go and search for any course and that's in that".* In this perspective, based on the yearly plan of activities, educational practices can be planned along with business strategies.

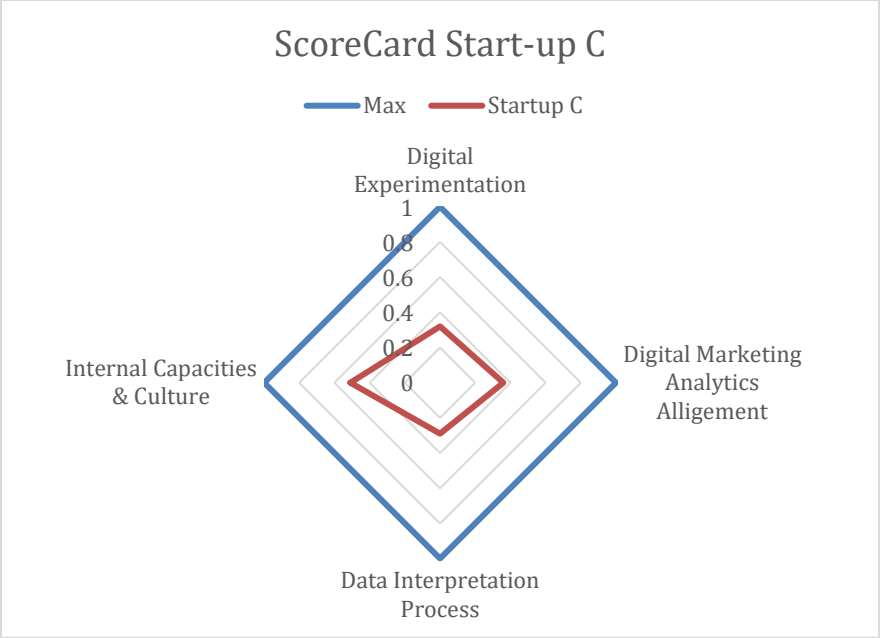


Figure 7.4. Start-up C ScoreCard Graph

Being that Digital experimentation and Digital Interpretation are the least developed components, the first steps for optimization can be done within these components. As the CRM is already implemented (but also can be further developed), the starting point of improvement can be aimed at the customer feedback structure (identified with a lower scope compared to other subcomponents).

6.10.4. Case Study 4

Product-Market Fit Activities & Digital Marketing Support Identification

The start-up D is still in a search of product-market fit (still establishing the client niche and product fit) and is in its early stage of development.

Start-up D is a Marketing Agency delivering performance marketing services to B2B clients, with defined budgets and investments in digital marketing. The aim is to work with clients which recognize the benefits of digital marketing and are willing to make continuous investments in their digital marketing (for several months until the result is made).

Table 7.10. Start-up Profile_D

Start-Up Profile	
Industry Type	**Marketing Agency**
Maturity Level	**Early-stage**
Business Model and Market	B2B; National
Number of Employees	1 + (one part-time soon)
Start-up Description	Performance Marketing Agency designing strategies and campaigns including full marketing support and consultancy on Google, Social Media Channels, Ads & campaigns, ane email marketing.
Case Study Identification Number	**D**

The Start-up also impacts the development of the client's business strategy, through digital marketing strategy. The founder is an experienced marketer who founded an agency (a year ago). The customer base is almost established, and revenue is growing but not sufficiently fast.

Digital Marketing in this early phase is mostly used for raising brand awareness and lead generation. From the market perspective, the founder is using platforms to collect inputs on customers & behavior (campaign analytics, google trends, Hootsuite), scans competition, and has a monthly newsletter to drive new subscriptions. For product validation, videos are used, as well as content marketing to educate customers.

The founder checks daily analytics and sets the metrics, but lacks time, staff, and data to enable insights from DMA. To test and experiment with digital marketing channels, the start-up uses Ads (Facebook & google ads). Heatmap is used to assess the webpage's main elements as links, buttons, opt-ins, and CTAs. When launching a Facebook campaign, A B tests are used to evaluate the post engagement, and landing pages are also used as a tool of validation. The founder also emphasizes the importance and insightful comments got from client interviews for product offering improvements (non-digital feedback).

Table 7.11. PMF Activities & Digital Marketing Support Identification_Start-up D

PMF Activities	**Digital Marketing Support**
Usage objectives of Digital Marketing	Lead generation; Conversion into sales; Trust Building (conversion from freelance to Start-up); Brand Building
Collecting inputs from the customer base and Client Base Growth	Hootsuite (for data on the market);
Market research	Competition scanning; Google trends to discover (new clients and services);
Forming Value Proposition (identifying pains & gains)	**Non-Digital:** Stakeholder/Partners meetings, Meeting with Clients (source of new ideas for content and services);
Establishing the right audience channel	Newsletter Subscription - Magazine monthly, Blog, Videos, and content on all the platforms are published at least once a week
Testing & Experimentation (including MVPs, Products/Services)	Ads: Facebook & google ads; HeatMap Landing pages, Facebook campaigns, AB post-testing; CTA; Videos (product validation)
Iteration & Feedback loops	No CRM; Feedback in google forms (after the service)
Product/ service improvements and business tactics connected to digital marketing	**Non-digital:** customer feedback (from previous experience) for product improvement Prospecting software: Gorilla leads (getting to new clients)
Analytics Software	Google Analytics, Google data studio
Correct usage of feedback and analytics	Daily checking analytics, no team yet, when the team is established detailed reporting on key metrics
Used Metrics	Customer retention; Number of subscriptions; Social media engagement (eg. likes, shares); Number of new/returning customers; Website Pageviews; Total marketing spend; Customer Lifetime value; Time spent on website/number of viewed pages

DM_Optima Scorecard

Digital experimentation. Although in the early stages, the start-up has already established a basic process of experimentation. Indicators for PMF are in the development phase, accompanied by

technologies supporting the conversion. But as hypothesis development is still in the development phase and as the PMF is still not achieved, a clear indicator should be developed and followed, in parallel with qualitative inputs (based on interviews or other non-digital techniques).

Digital Marketing Analytics Alignment is on a lower level. The process is lacking higher investment in designing effective metrics, as business and financial metrics are not connected to DM activity results. CRM is not yet established and the online presence needs to be optimized along with investment criteria and budget flexibility connected to the overall business strategy.

Table 7.12. Start-up D – DM_Optima Scorecard

Component	Code	Com Min - Max Value	Weight (per Value)	D Nominal	D - Final (with weight)	Start-up D (in % by component)
Digital Experimentation			**34.00**		**8.66**	**25.47%**
Hypothesis development	DX_1	0 – 5	14.00	0	0	
PMF Indicators	DX_2	0 – 4	16.00	2	8	
Technologies supporting data conversions	DX_3	0 – 6	4.00	1	0.66	
Digital Marketing Analytics Alignment			**24.00**		**6.26**	**26.08%**
Designing effective metrics	DMA_1	0 – 3	11.00	1	3.6	
Investment criteria & budget	DMA_2	0 - 3	8.00	1	2.66	
CRM Capability	DMA_3	0 – 2	5.00	0	0	
Data Interpretation Process			**24.00**		**2.66**	**11.08%**
Customer feedback structure	DI_1	0 – 3	6.00	0	0	
Team Involvement & KPIs	DI_2	0 – 4	10.00	0	0	
Team Reporting	DI_3	0 – 3	5.00	1	1.66	
Reporting Content	DI_4	0 – 3	3.00	1	1	
Internal Capacities & Culture			**18.00**		**5.58**	**0.08%**
Culture	IC_1	0 – 3	3.00	0	0	
Team & Skill set	IC_2	0 – 3	4.00	0	0	
Internal Process Documentation	IC_3	0 – 4	7.00	0	0	
Education	IC_4	0 – 4	2.00	2	1	
Creativity	IC_5	0 – 4	2.00	1	0.5	

Data Interpretation Process is on a medium level but needs investments in feedback structure, analytics conversion, and reporting. As the founder is still the only team member, there is no team for establishing the KPIs or other forms of activities usually done as team activities. By structuring the customer feedback (as next-level development), the start-up can benefit from having defined customer segments, and their characteristics (behavioral, financial) and based on the segmentation, prepare for future strategies and campaigns.

Internal Capacities & Culture. As the founder has already experience with start-ups and digital marketing, the components of education and skills development are recognized as important and invested in: "*I began one mentorship with a mentor, one month ago I started his mastermind program that is every two weeks…..the idea of that mastermind program is to help freelancers to switch to agencies which we talk about, everything related with business, the internal organization, recruitment, customer acquisition. I've also enrolled for one year already and I renewed it today, for another mentorship that is technical (for digital marketing) with a Portuguese trainer, you have access to Facebook groups and Telegram groups, and you have a big community that is very mature technically speaking where you can learn everything related to the technical part of the business*".

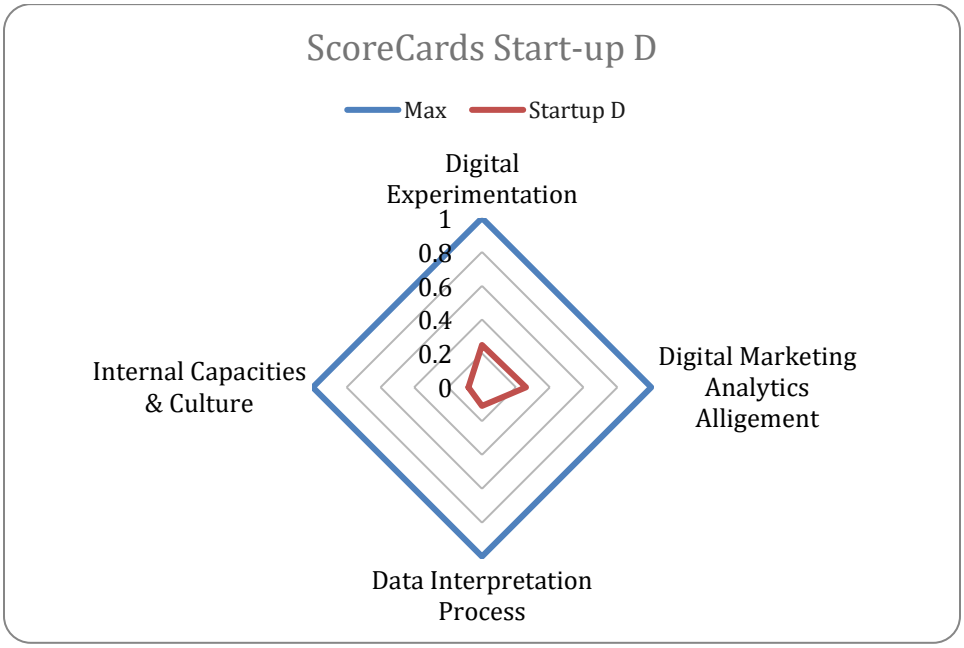


Figure 7.5. Start-up D Scorecard Graph

Although investing in education has surpassed the basic level, the start-up still lacks the staff to have an overall component of growth and development of next-level documentation encompassing a strategic plan aligned with business activities, identifying high-level goals, target audience, messaging, and channel strategies.

Despite being in the early stages, the start-up is benefiting from several aspects of digital marketing usage. Mostly due to the fact that the founder is an experienced professional in digital marketing and the start-up ecosystem. But as the founder is currently alone in the start-up, that fact affects the development of several processes in the current activities, which is also identified by the founder herself. In order to have full benefits from performance measurement, a number of components need to be developed or upgraded (such as hypothesis development, CRM, and process documentation).

6.10.5. Case Study 5

Product-Market Fit Activities & Digital Marketing Support Identification

Start-up E is a recruitment agency that uses agile tools in the candidate selection process. Start-up operates in national Portuguese and international markets (BENELUX) as a human resource management consultancy. This start-up is active for 3 years and has a B2B2C business model. This is the second start-up from the two founders. Start-up reports of being in a momentum of just achieving the product-market fit. The start-up has product-solution for some time already, additional features have been set, and constant growth of customers and revenues (conversion) reported as the highest in the last period, with sales cycles constantly being shorter. Furthermore, the start-up already established a functioning start-up team, including an experienced digital marketing team, and moved to new markets outside Portugal.

Table 7.13. Start-up Profile_E

Start-Up Profile	
Industry Type	Recruitment Agency
Maturity Level	Start-up;
Business Model and Market	B2B2C; National & International
Number of Employees	5 internal, 16 external
Start-up Description	Human Resources Management consultancy using Agile tools in the Recruitment & Selection and Professional Outsourcing processes while offering differentiation and competitiveness in the selection process.
Case Study Identification	E

Digital Marketing objectives are mainly connected to Lead Generation, Brand Building, and Internationalization. As the start-up is an international recruiting agency, digital marketing is constantly used for core business services. Social Media and Email Marketing are used for communication and client growth. In table 7.14. PMF Activities & Digital Marketing Support for Start-up E are presented.

Interestingly, when speaking of higher investments and brand building & promotion, the importance to be recognized as a start-up and achieving/maintaining the product-market fit on the market is mentioned: "*Here if you are talking about the large company as KPMG, really the big ones, you have interests (to invest in promotion). It's powerful marketing here that you are working with these guys if you are able to fulfill their challenge, you are open to fulfilling any challenge, so sometimes of course we do more efforts really to close on those projects because we really want to be connected with these companies. I can tell you, for instance, two weeks ago we put someone in the EDP (main electricity provider of Portugal), of course, we have turnover but sometimes it's not for the turnover it's not for a profit margin, it's just for that I can say we are working with EDP …So if you want to attract more candidates, if you want to attract more clients, if you want that your digital marketing is more effective, sometimes it's not budgeting, sometimes these other things that you do, it's losing money in other things in a way that your digital marketing really pops up because the people say this is the company that works with that client, well you're going to give a try*".

Table 7.14. PMF Activities & Digital Marketing Support Identification_Start-up E

PMF Activities	Digital Marketing Support
Usage objectives of Digital Marketing	Brand Promotion & Building (and rebranding), Lead Conversion, and Internationalisation;
Collecting inputs from the customer base and Client Base Growth/Market Research	LinkedIn, Instagram (high usage on a job posting, campaigns & client growth); Facebook (Rare usage, only for a certain type of job postings)
Forming Value Proposition	**Non-digital:** Interviews with clients and partners; Industry events
Establishing the right audience channel	Newsletter Subscription – trend postings (use other freelance marketers to get new ideas on content)
Testing & Experimentation (including MVPs, Products/Services)	Landing page; Consumer behaviors; UX very important and invested in (service done in 2 or 3 steps)
Iteration & Feedback loops	Pipedrive used for insights and data organization
Product/ service improvements and business tactics connected to digital marketing	The analytics from Pipedrive (time spent on a specific subject) helps to determine if the investment in a specific client will continue
Analytics Software	Google Analytics
Correct usage of feedback and analytics	Adapting budget based on the channel success of engagement and conversion
Used Metrics	Customer retention; Number of subscriptions; Social media engagement; Number of product users/sub/scribers; Number of new/returning customers; Website Pageviews; Number of unfiltered leads; Total marketing spend; NPS; Conversion rate

Start-up actively uses testing through digital marketing (campaigns, ads, landing pages) and mentions UX as an integral part of the efficient testing process. Continuing with testing, the founder emphasizes the use of CRM software (Pipedrive) and team skills for proper conversions done through digital channels.

DM_Optima Scorecard

Digital experimentation. As this start-up extensively uses digital marketing for experimentation, this component is on a high level. Meaning that agile and business analysis are used as concepts

and represent an integral part of a start-up's digital analytics practice. Moreover, the start-up has established a method following PMF indicators, and uses actionable metrics which are timely, consistent in the application, and tracked throughout the customer journey. The hypothesis development lacks one level for overall efficiency (a continuous testing improvement philosophy) and technologies can be upgraded towards implementing a process for leveraging AI/ML for insights through technologies supporting data conversion.

Digital Marketing Analytics Alignment. Departments jointly create KPIs in line with the overall plan, the start-up has established criteria for investments in digital marketing, has an adaptive quarterly plan of activities, and effectively uses CRM to boost its usage of analytics. Upgrades can be introduced in designing systems to predict and forecast business performance and make data-driven decisions in real-time.

Table 7.15. Start-up E – DM_Optima Scorecard

Component	Code	Com Min - Max Value	Weight (per Value)	E Nominal	E - Final (with weight)	Start-up E (in % by component)
Digital Experimentation			**34.00**		**25.84**	**76.00%**
Hypothesis development	DX_1	0 – 5	14.00	4	11.20	
PMF Indicators	DX_2	0 – 4	16.00	3	12.00	
Technologies supporting data conversions	DX_3	0 – 6	4.00	4	2.64	
Digital Marketing Analytics Alignment			**24.00**		**17.52**	**73.00%**
Designing effective metrics	DMA_1	0 – 3	11.00	2	7.20	
Investment criteria & budget	DMA_2	0 - 3	8.00	2	5.32	
CRM Capability	DMA_3	0 – 2	5.00	2	5.00	
Data Interpretation Process			**24.00**		**19.50**	**81.25%**
Customer feedback structure	DI_1	0 – 3	6.00	2	4.00	
Team Involvement & KPIs	DI_2	0 – 4	10.00	3	7.50	
Team Reporting	DI_3	0 – 3	5.00	3	5.00	
Reporting Content	DI_4	0 – 3	3.00	3	3.00	
Internal Capacities & Culture			**18.00**		**15.50**	**86.11%**
Culture	IC_1	0 – 3	3.00	3	3.00	
Team & Skill set	IC_2	0 – 3	4.00	3	3.00	
Internal Process Documentation	IC_3	0 – 4	7.00	4	7.00	
Education	IC_4	0 – 4	2.00	4	2.00	
Creativity	IC_5	0 – 4	2.00	1	0.50	

Data Interpretation Process. This component is also on the high levels where senior management has established a general culture of continuous experimentation. The ROI analysis is conducted for each channel, providing a clear understanding of which activities are driving revenue/growth and which are not. Reports are shared with relevant stakeholders, including executives and team members, to ensure everyone is aligned on goals and progress. The next upgrades include higher levels of customer feedback structure and reporting structure to enable real-time reporting while providing recommendations on which activities are likely to generate the greatest ROI.

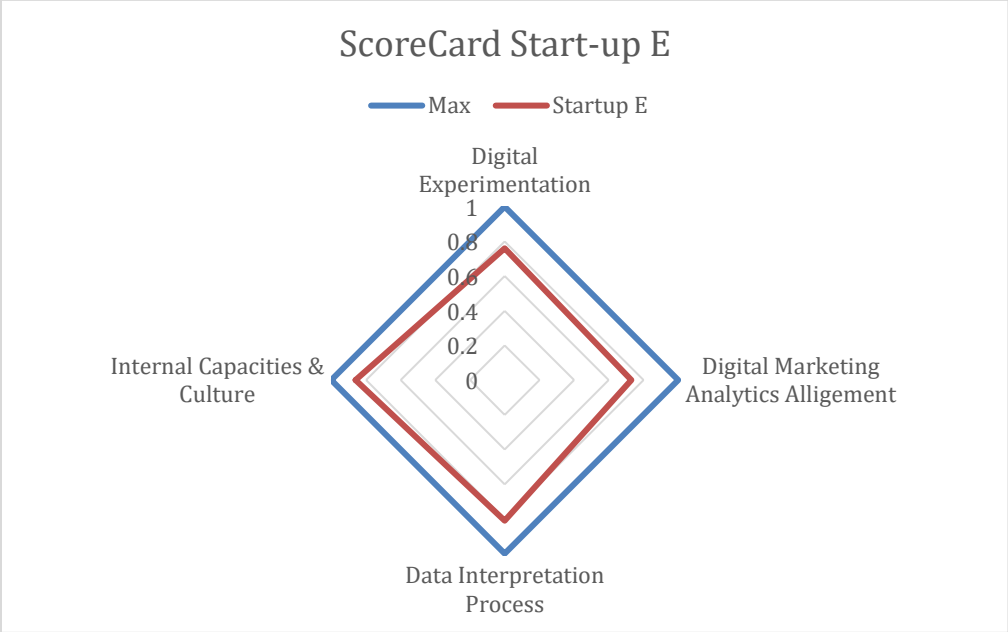


Figure 7.6. Start-up E Scorecard Graph

Internal Capacities & Culture. A person running digital marketing operations is identified as one of the crucial elements of the team's success: *"it's really important to have a powerful person for marketing, we have found a big guru…she's in Aveiro it's remote 100 % and she is a machine, let me explain this to you….we had marketing, but now we know that we didn't have the marketing …(before her) because the level of anticipation, the level of I would say demand in the delivery is high"*. As the start-up has all team resources and invests regularly in team education (with agile principles), only the component of creativity could be upgraded with higher investment specifically in this skill. The

first company the same founders have is focused on providing agile training for individuals and companies, which in this case, can be connected to the high levels of education with agile principles in this start-up.

In the overall scope, this start-up has high levels of digital marketing performance ability. Several upgrades can be identified in 3 subcomponents (technologies, reporting, and creativity).

6.10.6. Case Study 6

Product-Market Fit Activities & Digital Marketing Support Identification

Start-up F is a sports App and platform for the community of sports professionals and enthusiasts in need of a navigational guide for certain terrains. Product-Market Fit is still not achieved, star-tup is in the early stages of defining the customer base, reaching first-paying customers, and above all, testing the product and the features. Start-up clients come from Portugal and other countries, mostly connected to the extreme sport for which the platform and the app are being developed.

Table 7.16. Start-up F Profile

Start-Up Profile	
Industry Type	**Sports Platform/App**
Maturity Level	**Early stage;**
Business Model and Market	**B2B2C; National & International**
Number of Employees	2
Start-up Description	An Extreme Sports App optimized to provide guidance in the field (e.g. country site, terrains) for sports professionals and enthusiasts. The app can be used currently in Portugal as a navigation tool for certain terrains.
Case Study Identification	F

As this start-up is still searching for product-market fit, digital marketing supports the start-up search for PMF in market research, product & audience validation, and forming the value proposition.

Table 7.17. PMF Activities & Digital Marketing Support Identification_Start-up F

PMF Activities	Digital Marketing Support
Usage objectives of Digital Marketing	Client Communication, Brand Awareness, Lead Generation, Product development, Supply Channel
Collecting inputs from the customer base	Instagram, Youtube are used to discover needs, industry trends, and content related to the industry.
Market research	Competition scanning
Forming Value Proposition (identifying pains & gains)	**Non-Digital:** Interviews, focus groups (informal), events in the industry; Digital: Through Instagram, communicating with clients to understand needs (matching client needs and app functionalities)
Testing & Experimentation (MVPs, Products/Services)	Using videos as a support strategy follow-up on reactions (Product validation); CTA Button, Landing Page, SEO (including Page readability plugin for SEO);
Establishing the right audience channel	YouTube & Instagram videos/reels used to publish educational - how to use the app in the platform, small tutorials.
Analytics software	Instagram insights and google analytics
Iteration & Feedback loops	Data shared on team meetings (currently no CRM).
Product/ service improvements and business tactics connected to DM	Suggestions given on product features through social media
Correct usage of feedback and analytics	Weekly meetings on digital marketing analytics and decision-making on different topics depending on the previous week's insights (marketing strategy in general, SEO, Content, lead generation, Ux. and UI etc.). No reporting yet.
Used Metrics	Customer retention, Social media engagement (eg. likes, shares), Website Pageviews, Number of app downloads, bounce rate, engagement of social networks from clients

Instagram and Youtube are used for discovery (potential needs & pains), industry trends, and content related to the industry. Especially through Instagram, the founder communicates with

customers and gains insight on value proposition: "*Instagram, sometimes WhatsUp, phone, and email also…but they give me suggestions… they told me it would be cool if I had these two features, or maybe I can do this in another way and I like those suggestions and some of them are incorporated on their really good ideas*".

Founder also employs an interesting strategy in communication via digital channels emphasizing that it should be "responsive" and that "*people feel comfortable to share ideas, suggestions … they see me maybe as a friend and not a company face or something like that so they can approach me with this…. so that's why on Instagram I don't have a logo or a picture myself..its a person*". This signalizes founders aim to build trust and long-term connections from the initial phase.

In this phase (early-stage), the metrics start-up F follows are mainly engagement & website metrics and is opting towards conversion and PMF indicators (customer retention, bounce rate, number of apps downloaded). As a start-up is just starting to have paying customers, the indicators for PMF will need to be further developed, as well as an effective metric system through the sales funnel.

DM_Optima ScoreCard

With *digital experimentation* and *digital marketing analytics alignment*, the team has established several basic practices on how to benefit from digital marketing analytics and experimentation. PMF Indicators are set only through engagement metrics, but partly include processes that announce the usage of more structured PMF processes. Technologies for data conversions are currently done on traffic, web analytics, and social media without connection to planned outcomes or conversion points (next-level development). No large investments have been made yet, when investing in DM starts investing criteria and budgeting should be already in place (this is currently lacking).

Data Interpretation Process is developing and still needs a finetuned customer feedback structure and reporting practices (as the start-up develops). The team meets to set the KPIs together and

designs metrics for some practices specific to activities that are currently done. This can be connected to the fact that besides the founder, an experienced marketer works in the start-up. The team has weekly meetings and the discussion ranges from different topics of digital marketing "*sometimes it's about the website, the analytics that we have on the website downloads, we go through the numbers she explained to me what it means, it's good or it's not, and how could we improve that. For example, the bounce rate we went through that, she taught me how to improve, and in another meeting, we talked about the SEO, so it was all about SEO that meeting, and also the organic research results… she saw the numbers, she said oh it's very good you have a lot of organic that's good ….other times it's more about the strategy what would we do to get more clients and what tools do we have*".

Table 7.18. Start-up F – DM_Optima Scorecard

Component	Code	Com Min - Max Value	Weight (per Value)	F Nominal	F - Final (with weight)	Start-up F (in % by component)
Digital Experimentation			**34.00**		**4.66**	**13.71%**
Hypothesis development	DX_1	0 – 5	14.00	0	0	
PMF Indicators	DX_2	0 – 4	16.00	1	4	
Technologies supporting data conversions	DX_3	0 – 6	4.00	1	0.66	
Digital Marketing Analytics Alignment			**24.00**		**3.6**	**15.00%**
Designing effective metrics	DMA_1	0 – 3	11.00	1	3.6	
Investment criteria & budget	DMA_2	0 - 3	8.00	2.66	0	
CRM Capability	DMA_3	0 – 2	5.00	0	0	
Data Interpretation Process			**24.00**		**5.82**	**24.25%**
Customer feedback structure	DI_1	0 – 3	6.00	0	0	
Team Involvement & KPIs	DI_2	0 – 4	10.00	1	2.5	
Team Reporting	DI_3	0 – 3	5.00	2	3.32	
Reporting Content	DI_4	0 – 3	3.00	0	0	
Internal Capacities & Culture			**18.00**		**4.66**	**25.89%**
Culture	IC_1	0 – 3	3.00	1	1	
Team & Skill set	IC_2	0 – 3	4.00	2	2.66	
Internal Process Documentation	IC_3	0 – 4	7.00	0	0	
Education	IC_4	0 – 4	2.00	1	0.5	
Creativity	IC_5	0 – 4	2.00	1	0.5	

The mentioned team coordination can positively affect not just defining a better metric system, but also internal learning as identified within this presented example. The reporting

subcomponent is on a higher level signifying the team has established clear reporting criteria (monthly reports, constant feedback), but for certain experiments.

Internal Capacities & Culture. The start-up is still at the start of building its culture but already has some practices established (meetings, sharing between departments). The team has an experienced skilled marketeer and implements several performance measurement practices to help the decision-making.

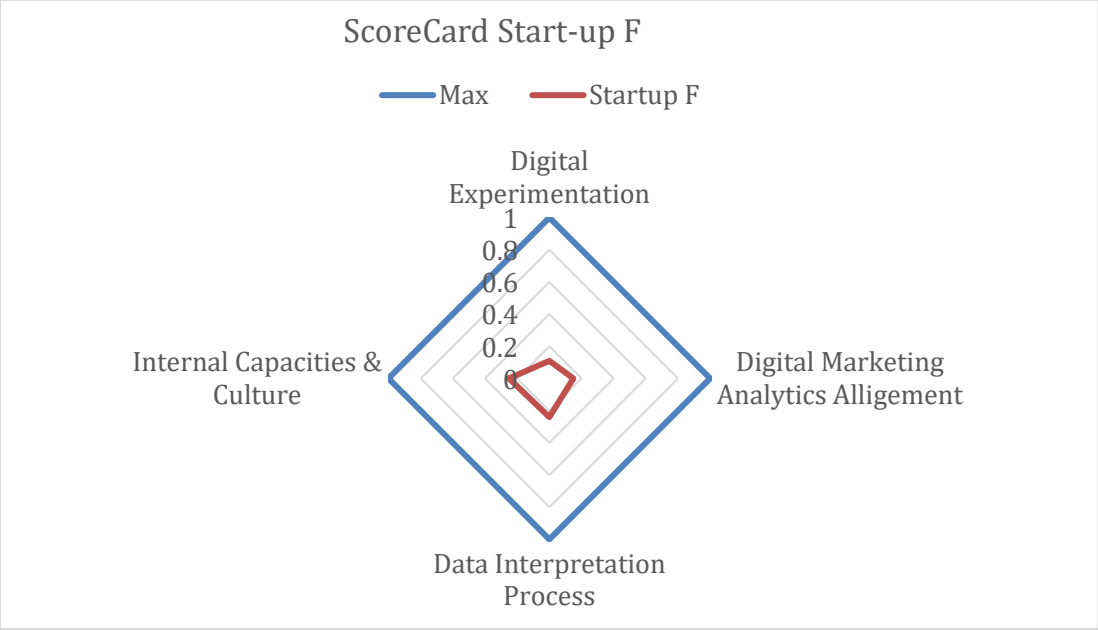


Figure 7.7. Start-up F Scorecard Graph

The education component and creativity are on starter levels, start-up follows some content connected to start-ups & growth on the web (blogs) but lacks concrete investment in both aspects.

6.10.7. Case Study 7

Product-Market Fit Activities & Digital Marketing Support Identification

Start-up G is a mature company providing Healthcare services and is currently one of the leaders in the Iberic region. The services are provided to 600 patients each month, with a focus on

a niche customer segment, in need of a specific body treatment done only once, making each of their customers a unique customer. Prices depend on the needed type of treatment and are defined based on the consultancy of the medical team.

Table 7.19. Start-up G Profile

Start-Up Profile	
Industry Type	Healthcare
Maturity Level	Mature Company
Business Model and Market	B2C
Number of Employees	500+
Start-up Description	Experience healthcare services provided to individuals in need of a specific treatment on their body. The treatment is done once, and due to the nature of this treatment, this company has unique customers (no returning customers). The company employs over 500 employees in 5+ different locations.
Case Study Identification	G

The objectives of using digital marketing are connected to maintaining the brand, rebranding, generating leads, and client communication. Interestingly, this start-up also connects brand building and having the continuously maintained the right PM fit for their clients "*basically to build the brand, so I would say the customer feedback is what actually helps us to build the brand because that is something that we are always working towards. Although our client is typically a performance client, we also have to work a lot on building the brand or keeping the brand alive because there are competitors and we have cheaper competitors who have those procedures at cheaper prices, so we have to continuously build a brand and maintain that level in the market so that is where the testimonials and the feedbacks come together*". Thus, a start-up uses testimonials and customer feedback as tactics not just to build the brand, but also to check and maintain the level of service (the right fit).

Biding strategies, A-B testing, customer segment, and CTA buttons are constantly used for experimentation and lead generation. Digital experimentation is also highly used to understand the change in the audience & market entry points (as start-up operates in different countries).

Table 7.20. PMF Activities & Digital Marketing Support Identification_Start-up G (1/2)

PMF Activities	Digital Marketing Support
Usage objectives of Digital Marketing	Brand Building (and Maintaining), Rebranding, Lead Generation, Client Communication
Collecting inputs from the customer base	Testimonials (used for insights and adds); Simulator of needs (on the web page)
Market research	Competition benchmarking; google search
Forming Value Proposition (identifying pains & gains)	**Non-digital:** Stakeholder/Partners meetings, TV, Billboards, Radio, Sponsorships (with reality shows, games) Digital: Video Consultations by experts (part of sales funnel to identify the right needs), Virtual Simulator
Testing & Experimentation (MVPs, Products/Services)	Bidding strategies for our audiences, customer segments for different kinds of campaigns which campaign is performing better, A B testing for our landing pages, CTA buttons;
Establishing the right audience channel	A B testing (understanding the change in the audience & market entry points); Focus on conversion rate and linking the offline data to online for the right automation/filtering to reach to the right audience - Link each user and track it back to the right sales
Analytics software	Currently changing into new google analytics tool - GA4, creating new funnels (the goals and everything you know to basically measure and we're actually going uh through a lot of analyzing these tools and analytics what we should have what we should not have)
Iteration & Feedback loops	CRM (Hubspot) – currently calibrating CRM, and marketing analytics with touchpoints. Benchmarking against the peers (the competitors) and, the quality of leads that come in the lead to sale conversion (CPL and CPA levels) - measurement depends on channels, it's not the same CPL in google or google display or Facebook, Instagram, organic.
Product/ service improvements and business tactics connected to digital marketing	Customer feedback for building and maintaining the brand (testimonials and feedback). Social media comments are hidden because of PR strategy – the company has a famous person connected to the brand and some comments on ads are irrelevant to the product/company so there's the general rule of always hiding the comments (regardless if the comments are good or bad).

Table 7.20. Continued (2/2)

PMF Activities	Digital Marketing Support
Correct usage of feedback and analytics	Sales teams and marketing teams meet all the time (sometimes meeting, sometimes calls, emails) as the interconnection between the two departments is crucial.
Used Metrics	Website Pageviews, Total marketing spend, Referral program growth, Bounce Rate, Lead Generation, Cost per Lead (CPL), CPA (Cost per Acquisition), ROI, ROI growth, Online to Offline data

The sales funnel is designed with many touchpoints so the rates on different touchpoints can be tracked and measured. All actions are focused on conversion rates (a group of metrics connected metrics as indicated in Table 7.20.), and total marketing costs as an important indicator emphasized by the manager.

With digital channels, the manager emphasizes filtering the leads on a landing page with having a form/simulator on what kind of health problems they have, which body parts, and finalize with contact info so the customers can be reached by consultation team: "*So our sales cycle is basically this so once they do a lead, submission our consultation team gives them a call back to understand if they are interested, what they want to do, and everything. Once they do that then they follow up and it's a free consultation, they can sign up for a free consultation at the clinic or through a video call*". The video call practice was developed through the Covid pandemic and start-up continued to use this useful practice.

DM_Optima ScoreCard

*Digital Experimentation***.** The PMF indicators are indicated through their sales funnel in line with effective metrics connected to the business results (metrics include: Website Pageviews, Total marketing spend, Referral program growth, Bounce Rate, Lead Generation, Cost per Lead (CPL), CPA (Cost per Acquisition), ROI, ROI growth, Online to Offline data).

Table 7.21. Start-up G – DM_Optima Scorecard

Component	Code	Com Min - Max Value	Weight (per Value)	G Nominal	G - Final (with weight)	Start-up G (in % by component)
Digital Experimentation			**34.00**		21.72	**63.88%**
Hypothesis development	DX_1	0 – 5	14.00	3	8.40	
PMF Indicators	DX_2	0 – 4	16.00	3	12.00	
Technologies supporting data conversions	DX_3	0 – 6	4.00	2	1.32	
Digital Marketing Analytics Alignment			**24.00**		24.00	**100.00%**
Designing effective metrics	DMA_1	0 – 3	11.00	3	11.00	
Investment criteria & budget	DMA_2	0 - 3	8.00	3	8.00	
CRM Capability	DMA_3	0 – 2	5.00	2	5.00	
Data Interpretation Process			**24.00**		22.00	**91.67%**
Customer feedback structure	DI_1	0 – 3	6.00	3	4.00	
Team Involvement & KPIs	DI_2	0 – 4	10.00	4	10.00	
Team Reporting	DI_3	0 – 3	5.00	3	5.00	
Reporting Content	DI_4	0 – 3	3.00	3	3.00	
Internal Capacities & Culture			**18.00**		16.50	**91.67%**
Culture	IC_1	0 – 3	3.00	3	3.00	
Team & Skill set	IC_2	0 – 3	4.00	3	4.00	
Internal Process Documentation	IC_3	0 – 4	7.00	4	7.00	
Education	IC_4	0 – 4	2.00	4	2.00	
Creativity	IC_5	0 – 4	2.00	1	0.50	

As PMF Indicators, the company also uses qualitative testimonials to check the satisfaction of finished treatments. The need for development is indicated in the parts of hypothesis development where the next step can be made towards a proven methodology for digital analytics such as Agile while experimenting with digital marketing. Secondly, for a more effective transfer of data through technologies, the team is trying to link the offline data to online for the right automation/filtering to reach the right audience - Link each user and track it back to the right sales (by using cookies and other analytics).

Digital Marketing Analytics Alignment is fully aligned, quarterly and monthly plans are developed, processes and criteria for investments and budgets are defined, and CRM is actively used to integrate data from different sources.

Data Interpretation is on a high level with room for improvement in customer feedback structure for higher customer journey optimization with customer experience analytics tools. All departments participate in KPIs development and the Marketing Manager emphasizes the practice of sales teams and marketing teams meeting all the time (sometimes meeting, sometimes calls, emails) as the interconnection between the two departments is crucial.

The Internal Capacities & Culture are almost fully developed - the team has all the skills and the organizational culture is built on continuous cooperation and sharing. The possible upgrades include agile education policies and structured ways of boosting creativity.

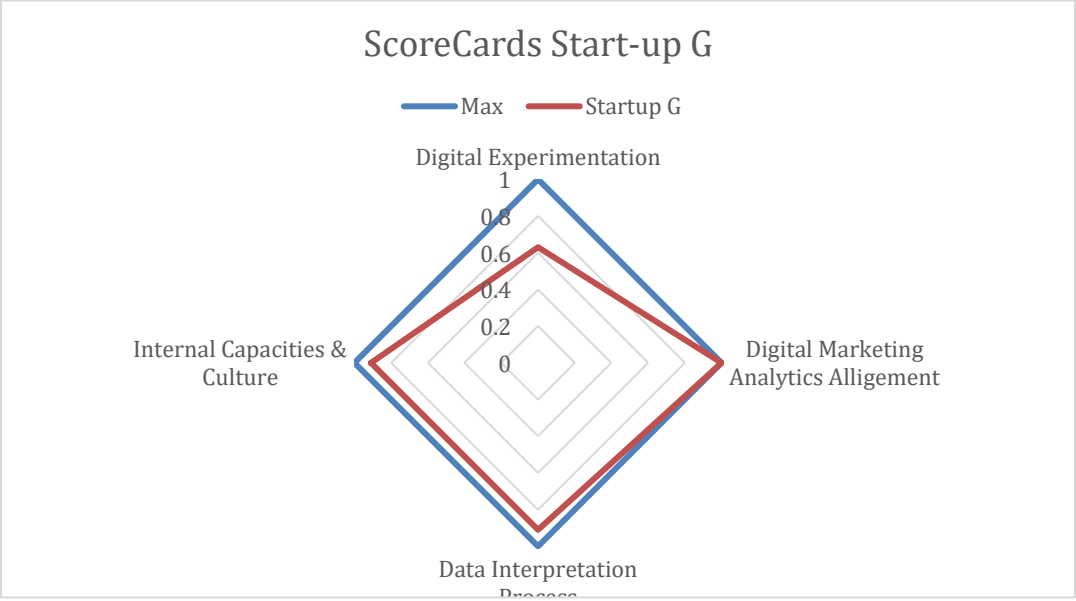


Figure 7.8. Start-up G Scorecard Graph

Generally, the start-up has a robustly developed process of digital marketing performance and is benefiting from this alignment (with improvements in the previously mentioned subcomponents).

6.10.8. Case Study 8

Product-Market Fit Activities & Digital Marketing Support Identification

Start-up H is in the early stages still searching for PMF. The start-up is developing a smart content monetization platform to match content buyers and content sellers with the right type of content, globally. Content includes movies, series, games, vlogs, documentaries, and others. Some traction has been done, but without constant revenue, and the customer base is slowly growing. As this start-up is also actively searching for investors, their growth strategy is defined by two points. Without investors – continue bootstrapping with internal resources and applying for different types of national funds while slowly building up the customer base. Secondly, when invested, a large part of the investment will be invested in digital marketing strategy (several campaigns towards markets defined by the high percentage of content buyers and sellers e.g. Nigeria).

Table 7.22. Start-up H Profile

Start-Up Profile	
Industry Type	**Content Monetisation Platform**
Maturity Level	Early-stage
Business Model and Market	B2B2C
Number of Employees	4 (2 full-time, 2 part-time)
Start-up Description	Smart Content Monetisation platform for customizing, publishing, promoting, and monetizing different types of content. Movies, series, animation, clips, vlog, shows, music is published on the platform, a match is found within the content buyers segment, and the content gets monetized worldwide.
Case Study Identification	H

The main usage of digital marketing is focused on identifying the market, testing business models, product development, and brand building.

Table 7.23. PMF Activities & Digital Marketing Support Identification_Start-up H

PMF Activities	Digital Marketing Support
Usage objectives of Digital Marketing	Lead Generation, Brand Building & Awareness (including investors), Client Education, Product Development, Testing business model
Collecting inputs from the customer base	Keyword search (for discovering trends and market understanding)
Market research	Weekly (new) competition scanning or new players – including Instagram page and see what are the latest news; Checking YouTube daily to find what is the latest trends; Instagram reports - the best topics – monthly and annually
Forming Value Proposition (identifying pains & gains)	**Non-Digital:** Interviews, Stakeholder/Partners meetings, interviews - weekly meetings with new content creators and buyers to understand needs/recent issues with content monetization
Testing & Experimentation (MVPs, Products/Services)	In the early stages, the soft launch of the platform has been done. Planned digital marketing campaign covering one specific country/region depending on the investor and market after the first investment (eg. Nigeria as it has a lot of content producers). For AB testing more data (and funds) are necessary, but it will be one of the first future activities (especially for the international market)
Establishing the right audience channel	Keyword search (SEO) for audience fit (google trends, keyword IO) Blogs by SEO standards (keyword tree etc.)
Analytics software	Google Analytics
Iteration & Feedback loops	Done with manual tracking, CRM not yet established.
Product/ service improvements and business tactics connected to digital marketing	Pivoting via YouTube – through publishing on YT channel understood the complexity of YouTube KPIs for each user, so the strategy was changed
Correct usage of feedback and analytics	Weekly session on website metrics revision (bounce rate, other KPIs), technical team doesn't participate yet (planned to participate in the future)
Used Metrics	The quality of the content, the duration of the licensed content on a specific market, the type of the content; Churn rate, Number of product users/subscribers, Number of new/returning customers, Website Pageviews, Customer Lifetime value, time on site; Number of users - the diversity; number of users from the top countries in the content creation, the number of users the diversity of the users; the number of users from the top countries in the content creation

As start-up works on content monetization, based on the gathered analytics while publishing on YouTube, start-up pivoted and changed its business model *" we do the test, we make a YouTube channel and I start to publish like others and we understand that no, YouTube is a deep really deep issue itself, with lots of details, lots of KPIs, so we understand that okay we should just license the content, find the best content buyers by AI, and just pass the contents to them and then help them to analyze and maximize the revenues in their (YouTube and other) channels. So in this way, we don't ask them to just go out from the market, we are coming in the market, so (our) position changed*". When their position changed, so did their business model and now the core business is licensing and publishing the content from content sellers to content buyers. As the founder emphasizes, a lot of content producers (e.g. video game players, artists, and documentary movie producers) are not aware of the magnitude or options of how their content can be monetized. Therefore, firstly start-up wants to inform amateur content producers that they can easily become content sellers, and via their smart monetization platform, they can sell their content globally.

For establishing the right audience and understanding the market, the founder extensively uses SEO, keywords, Google Trends, and creates blogs. As this is a more specific industry, in addition to more general actionable metrics, the used and tracked KPIs are closely linked to video as format, including the quality of the content, the duration of the licensed content on a specific market, and the type of content.

DM_Optima ScoreCard

Digital Experimentation. Founder's previous experience in the e-commerce and gaming industry impacted the high levels of digital experimentation and DMA Alignment as the models of digitally testing products through analytics have been transferred into this start-up: "*the best way to do that (using digital marketing analytics) is, of course, check the bounce rate, the A B testing because nothing is perfect in digital, you just change something to another one you see it works better but it doesn't mean that it is the best way...but really in digital we can see it easily (how the change happens)*". The start-up team extensively uses A B testing, customer segmentation, checks bounce rates, Customer

Lifetime Value, and other metrics to measure the performance of their activities. In this way, the PMF indicators and metrics are defined over the basic level, including different markets, as published content is tracked in different countries (through google analytics). Outcomes, conversion points, and KPIs need to be defined in line with business goals as part of further development for technologies supporting data conversion.

Table 7.24. Start-up H – DM_Optima Scorecard

Component	Code	Com Min - Max Value	Weight (per Value)	H Nominal	H - Final (with weight)	Start-up H (in % by component)
Digital Experimentation			**34.00**		**14.92**	**43.88%**
Hypothesis development	DX_1	0 – 5	14.00	2	5.60	
PMF Indicators	DX_2	0 – 4	16.00	2	8.00	
Technologies supporting data conversions	DX_3	0 – 6	4.00	2	1.32	
Digital Marketing Analytics Alignment			**24.00**		**12.52**	**52.17%**
Designing effective metrics	DMA_1	0 – 3	11.00	2	7.20	
Investment criteria & budget	DMA_2	0 - 3	8.00	2	5.32	
CRM Capability	DMA_3	0 – 2	5.00	0	0.00	
Data Interpretation Process			**24.00**		**13.98**	**58.25%**
Customer feedback structure	DI_1	0 – 3	6.00	1	2.00	
Team Involvement & KPIs	DI_2	0 – 4	10.00	2	5.00	
Team Reporting	DI_3	0 – 3	5.00	3	4.98	
Reporting Content	DI_4	0 – 3	3.00	2	2.00	
Internal Capacities & Culture			**18.00**		**7.91**	**43.94%**
Culture	IC_1	0 – 3	3.00	2	2.00	
Team & Skill set	IC_2	0 – 3	4.00	2	2.66	
Internal Process Documentation	IC_3	0 – 4	7.00	1	1.75	
Education	IC_4	0 – 4	2.00	2	1.00	
Creativity	IC_5	0 – 4	2.00	2	0.50	

Digital Marketing Analytics Alignment. Start-up has some points of alignment designed but still missing integrated CRM, defined investment criteria, and a fully defined metric system. In this (and next) phase, as a start-up needs to deal with a lot of international clients and will have large numbers of visitors and users (when the product is fully launched), the CRM software could be an effective solution as it will integrate and classify large amount of data which will be available from different platforms. Especially as a start-up will have many customer segments (content

buyers, sellers from different industries and countries) the classification of this type can be beneficial to maneuver data and identify trends or to start with, identify different customer segments with the specific product offering.

As for the *Data Interpretation Process*, the feedback structure, and technologies for insight conversion have just reached medium levels and require further investments. The feedback system needs to have a detailed feedback structure integrated into one system enabling the start-up to see points of satisfaction/dissatisfaction. The reporting structure and content need to be upgraded to coherently support the decision-making process on reliable and effective data.

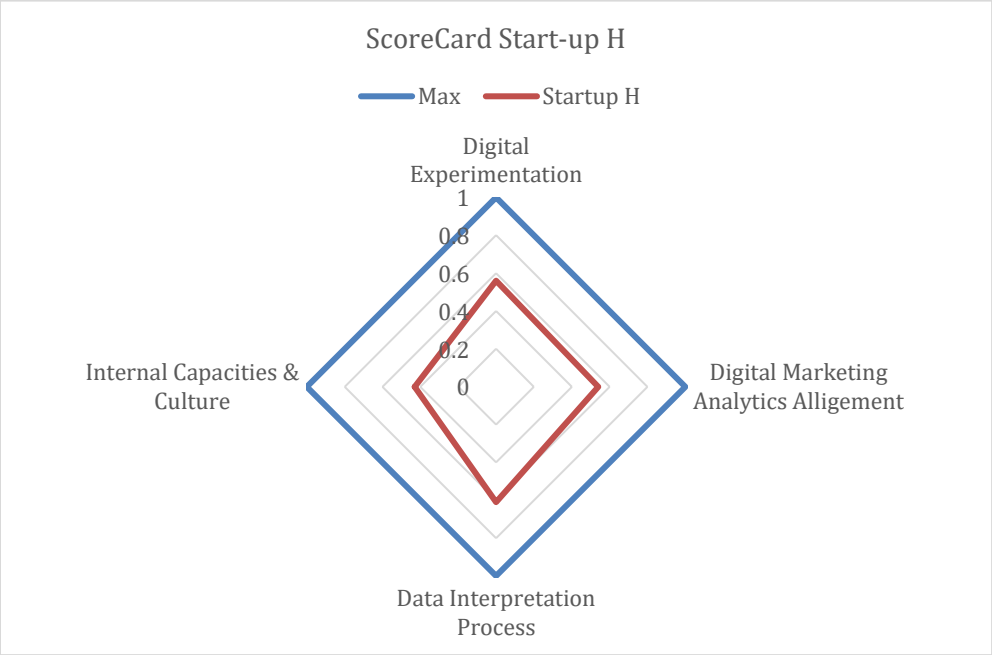


Figure 7.9. Start-up H Scorecard Graph

The experience of the two founder members is also visible in *Culture* and of course the existing *skill sets*, which are on a medium level (regular cooperation and advanced skill set), but in need of support from technical personnel. The culture organized around data is in development, as is the case with education and creativity. One of the problems this team indicates is the lack of educational content around content monetization: "*We really don't need those general courses because we know the general ones (on digital marketing), we need the digital marketing tools which can help on the*

content business, for example, the watch time of videos aren't really important in lots of digital businesses but for us, it's really important that is the users see the video up to the end".

In the overall setup, the start-up already capitalizes on digital marketing usage for experimentation and data interpretation for their product-market fit (Figure 7.9.). Focus on further improvement can be identified in CRM and feedback subcomponents and aspects of internal capacities.

6.10.9. Case Study 9

Product-Market Fit Activities & Digital Marketing Support Identification

Sstart-up I is a developed start-up with a steady growth of new customers and established revenue on several streams. The start-up is a software development service provider in Portugal, working for international and national clients, and currently has 54 employees. Start-up co-develops products with other companies.

Table 7.25. Start-up I Profile

Start-Up Profile	
Industry Type	**ICT – Software Development**
Maturity Level	Start-up
Business Model and Market	B2B2C; National and International
Number of Employees	54
Start-up Description	An international software development specialized to help companies grow in specific development areas of: - Digital transformation - Robotic Process Automatization - Mobile Solutions - Chatbot Services
Case Study Identification	I

In this perspective Start-up I develops a product from a technical side and the business model perspective. Start-up reports achieving the product-market fit, and the main objective of digital marketing is focused on brand building and lead generation. Also, a large amount of time is spent on market research and digital experimentation as the core business is software development in partnership with other start-ups.

The Marketing Manager emphasizes the need to invest time in market research right from the start for this (and any) kind of co-development/partnership as doing market research after the product is launched (or in the later stages) is not beneficial.

Table 7.26. PMF Activities & Digital Marketing Support Identification_Start-up I

PMF Activities	Digital Marketing Support
Usage objectives of Digital Marketing	Lead Generation, Building brand and Awareness, Testing business model
Collecting inputs from the customer base	Keyword search on google, Surveys in product development
Market research	Identification of key partners for new products, Competition scanning
Forming Value Proposition (identifying pains & gains)	**Non-digital:** Interviews, Stakeholder/Partners meetings; Conventions (meeting new partners)
Testing & Experimentation (MVPs, Products/Services)	Wireframe for first tests, CTA button; Landing page for the new product along with google ads, and the social media
Establishing the right audience channel	Educational and technical posts on LinkedIn, Instagram (more casual, memes and jokes)
Analytics software	Google studio, LinkedIn Analytics
Iteration & Feedback loops	Notino is used for internal communication (constant communication with sales, and marketing technical team); Pipedrive used as CRM
Product/ service improvements and business tactics connected to digital marketing	CTAs and Landing pages.
Correct usage of feedback and analytics	Week by week meeting with the communication marketing and design team
Used Metrics	Customer retention, Number of subscriptions, Social media engagement (eg. likes, shares), Number of product users/subscribers, Website Pageviews, Number of app downloads.

Since start-up develops software for other clients and research on business model development is also part of the development. Hence, the usage of digital marketing is from both aspects, as a start-up individually, and as a partner when it comes to product/model development.

Notably, a large part of the research is focused on research prior to product development to understand the market, customer behavior, pains, and gains. Surveys are used throughout this process:" *we prepare a survey, each survey is different so it depends on what we are accomplishing and the goals of that survey, most of them, is to understand how they see it in the market the perspective of the customer, the feedback, the satisfaction, and everything*".

From a testing perspective, the team uses CTA buttons, Landing pages when launching new products along with google ads and social media. The main KPIs are the number of downloads and a number of active users. From an engagement perceptive, Marketing Manager marks the importance of having higher numbers in social media, more followers, and more engagement. In line with this notion (as well as for brand building) start-up works on educational posts.

DM_Optima ScoreCard

*Digital Experimentation***.** Since start-up uses digital marketing for market research on their own and their client's projects, the Hypothesis development is on a higher level and the start-up has a developed their own methodology. PMF Indicators are defined through the customer journey of the product which is being developed. A subcomponent of technologies supporting data conversion is on medium levels, and the next steps include implementing customer experience analytic tools.

Digital Marketing Analytics Alignment is the highest developed component for this start-up meaning that the preparations for effective data interpretation are almost fully designed. The

team does design metric systems on a certain level, but they are not yet made with certain methodologies (e.g. RACE or SMART) or connected with concrete financial outcomes.

Table 7.27. Start-up I – DM_Optima Scorecard

Component	Code	Com Min - Max Value	Weight (per Value)	I Nominal	I - Final (with weight)	Start-up I (in % by component)
Digital Experimentation			**34.00**		**17.72**	**52.12%**
Hypothesis development	DX_1	0 – 5	14.00	3	8.4	
PMF Indicators	DX_2	0 – 4	16.00	2	8	
Technologies supporting data conversions	DX_3	0 – 6	4.00	2	1.32	
Digital Marketing Analytics Alignment			**24.00**		**17.52**	**73.00%**
Designing effective metrics	DMA_1	0 – 3	11.00	2	7.2	
Investment criteria & budget	DMA_2	0 - 3	8.00	2	5.32	
CRM Capability	DMA_3	0 – 2	5.00	2	5	
Data Interpretation Process			**24.00**		**12.98**	**54.08%**
Customer feedback structure	DI_1	0 – 3	6.00	1	2	
Team Involvement & KPIs	DI_2	0 – 4	10.00	2	5	
Team Reporting	DI_3	0 – 3	5.00	3	4.98	
Reporting Content	DI_4	0 – 3	3.00	1	1	
Internal Capacities & Culture			**18.00**		**11.16**	**62.00%**
Culture	IC_1	0 – 3	3.00	3	3	
Team & Skill set	IC_2	0 – 3	4.00	2	2.66	
Internal Process Documentation	IC_3	0 – 4	7.00	2	3.5	
Education	IC_4	0 – 4	2.00	3	1.5	
Creativity	IC_5	0 – 4	2.00	1	0.5	

Data Interpretation subcomponents are on medium levels. The lowest developed component is Reporting content, which was mentioned as an effective activity with concrete results but was changed to informing staff members on weekly meetings on key development as there was lack of time to do the reports: "*but now we have a lot of meetings so they know what is going on, what happened, but yes, we have to start doing probably social media reports again so they can know everything*". If the meetings result in concrete actions and decision-making around digital marketing, the reports might be an unnecessary element. But if one point of merging all the data which is available to everyone doesn't exist (which wasn't identified), reporting as practice can bridge this gap and add to higher efficiency. The report content should follow the earlier developed plans

and indicate changes (or outliers). The subcomponent of feedback is on a medium level and the next steps include detailed journey taxonomy/feedback classification development.

Although *Culture* is set to nourish continuous experimentation, subcomponents of *skill sets*, and resources still need to be upgraded. As start-up is growing and expanding the work, lack of time (and resources) was again mentioned as one of the needed points for future growth of performance measurement: "*Our CEO said sometimes we have to do this (structure on methodology, reporting) but we are changing it every week because we have a lot of work …. our design team it's one person so I have to fit in his time to do marketing and communication so we don't have it… if I have a big team I would have a methodology and work like that but we are small*". In process documentation, the lacking element is a detailed yearly and quarterly plan of activities accompanied by main KPIs.

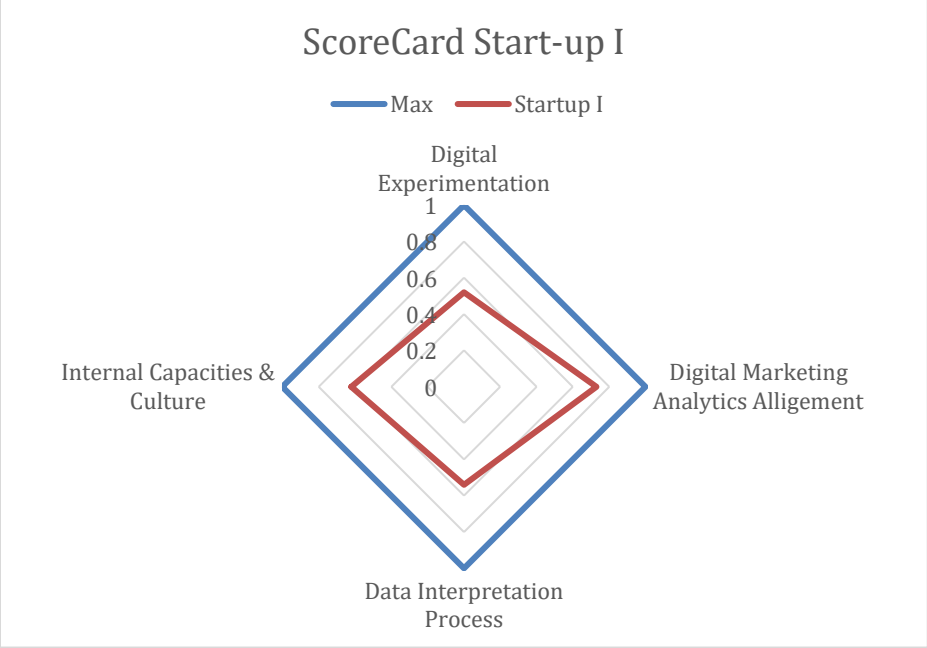


Figure 7.10. Start-up I Scorecard Graph

Generally, the start-up highly benefits from digital marketing activities and does several aspects of performance measurement and the PMF process. To fully use the benefits of measurement

investments are needed in several aspects, starting from the team, including allocating more time for designing a supportive structure on digital performance.

6.11. Cross-case Study Analysis & Results

In this cross-case analysis, four analyses will be conducted. The first one summaries all exemplified digital marketing support done for product-market fit activities (which was in detail, case by case, described through the first part of the individual case study analysis). The points of influence on Product, Market, and Conversion areas have been analyzed from the aspect of all 9 case studies (Figure 7.11).

The second cross-case analysis includes the analysis based on start-up maturity and product offering maturity. This analysis was done to map out start-ups based on their maturity level, DM_Optima ScoreCard values, and whether their product offering is evolving or has a more mature state (Figure 7.12.). This analysis was also used as a basis for making Digital Marketing Performance Measurement Quadrants, as the third cross-case analysis of this work. Following the already established DM_Optima values of each start-up from the previous analysis, their maturity status, and their characteristics enabled the establishment of four different quadrants of maturity (Figure 7.13).

The fourth analysis includes a detailed examination of each of the 4 main components of the DM_Optima framework. The connections based on different values start-ups possess have been established, described, and interpreted (Table 7.29.). All the cross-analysis points and conclusions ultimately led to an evolved DM_Optima framework.

6.11.1 Cross-Case Analysis of Digital Marketing Support in Product-Market Fit Activities

As a result of the overall analysis of how start-ups use digital marketing in the product-market process, in Figure 7.11., the main points and practices used by start-ups are identified.

The Figure 7.11 identifies the product, market and experimentation & conversion area, based on the nine case studies and their usage of digital marketing connected to the product-market fit.

From the product aspect, digital marketing was used in process of forming a value proposition (Start-up F – client feedback through Instagram), to testing the products and customer journey points with user experience and CTA buttons (Start-up G & I). While integrating digital marketing analytics and general data from their customers through CRM, the Start-up A got an insight into new service possibilities. This points out what was already identified by research from (Hartono et al., 2020) that social media can be used as a supply chain tool and data gained from these exchanges can benefit companies from the perspective of new service design. The same start-up also benefited from new partnerships (from the same industry vertical) as they inserted the data into their CRM which helped them to identify the potential for new services. Another importance of organized CRM is also noted in the Start-up E - the advanced stage of a sales funnel (evaluation). Based on insights gathered from the Pipedrive reports they could identify on which solution points the customers spend most of their time, and used this insight to better calibrate the offering towards clients: "*We use Pipedrive and you can identify which time each client spends for any pages, so if I had a client that goes for the solution one minute, and goes for the price 30 seconds means that he's really interested in the solution*".

Videos, blogs, newsletters, technical and how-to articles are used for customer education on a product or industry. Videos in general are highly used as a tactic for generating leads and brand building: "*Basically small videos of the app showing the new features that nobody still has and that actions started generating interest from these two (first) clients*" (Start-up F). In this perspective, videos are also used with more mature stabilized start-ups for maintaining the brand (including the PMF) and lead generation:" *I am going to start to make interviews, video interviews with some of my clients …not specific of our work, but the application of our work in their world…. It's like a video blog, I'm going to make that interview, send it and publish it on YouTube so other presidents (potential clients) see what they (existing clients) say*" (Start-up A).

Figure 7.11. Main points of digital marketing for product-market fit in start-ups

Continuing with maintaining the fit on the market, Start-up G connects brand building and having the right fit for its customers and uses testimonials and feedback to check satisfaction rates. Interestingly in both of the mature start-ups (A & G), aspects of maintaining the right fit are connected with brand-building actions through digital marketing.

From the market side, what was noticed in the majority of case studies is that start-ups speak about customer activation, followed by narrowing down and fine tunning the audience. In this sense, digital marketing channels serve as points to target and recognize the audience demographics and behaviors. Secondly, after the first campaigns are made and tested, further investments were also made in DM, thus digital marketing channels served as "audience validation" instruments prior to higher investments. This insight confirms (Conway and Hemphill, 2019) conclusion that start-ups first try to reach product-market fit, and afterward invest in growth hacking. The competition scanning is done with mostly all of the start-ups, not just to get an understanding of the market, but also to benchmark their current position and follow trends. The barriers mentioned in this perspective are lack of traffic, clicks on the website/post so the data could be properly analyzed, and lack of time and qualified personnel to work on analysis. This is a consistent problem mentioned not just in the early stages, but also in the stabilization and start-up/mature stages.

Between the areas of product and market fit, the area of "experimentation and conversion" is identified in this research. This area is defined by a group of interactions supported by digital marketing that lead towards a concrete operational output, or it materializes into insight through digital experimentation or conversion. The main usage of digital experimentation on DM channels is linked to campaigns, user experience, CTAs, wireframes and other tools connected to platforms or websites. In this perspective, start-ups use landing pages to test solutions. In addition to landing pages, through this research, other tactics for lead generators such as salary calculators, FAQs, and Simulators have been used by start-ups. The following tactics are used to filter the customers and get qualified leads for further conversion. From a business model perspective, testing the models via freemium service is also done through landing pages. All the

mentioned tactics are used to, in some way, experiment with the product offering and customer segments, to convert a customer into a paying one.

What also seems to be the ongoing activity was tracking trends in the start-up industry, mainly through Google Trends, Youtube and Instagram. The start-ups also analyze the periodical industry reports published online (such as HootSuite yearly report) and these activities help them to better understand the market and formulate their product offerings (Start-up D). Online B2B review platforms such as Clutch and Upleads are also mentioned as lead generation and brand awareness tools (Start-up C). Interestingly, Start-up B actively uses Instagram as a recruitment tool with continuous high conversion rates (in new members).

From the internationalization aspect, start-ups use digital marketing strategies to test the market. Start-up I used Outplay, the sales engagement platform, for penetrating international markets as part of their digital marketing strategy. By designing a marketing campaign with Outplay in several steps (sending emails as reminders and making one storyline from the campaign), this start-up is gaining new international clients: "*Imagine on the first email you touched a specific pain point and got no feedback, so maybe on the second email you'll touch another pain point of the client's area to try to seduce him to talk to you. We have been having a lot of success with this marketing strategy mainly abroad, in Denmark or UK*", which identifies the successful usage of this tactic for internationalization.

6.11.2. Mapping start-ups based on Product offering Evolution and DM_Optima Values

In order to identify how nine start-ups of different maturity levels and product offerings optimize on digital marketing performance measurement for PMF optimization, this mapping was made. The mapping was designed to classify start-ups based on their product offering evolution, maturity level and individual DM_Optima Scorecard results.

Table 7.28. Product offering Evolution in Start-ups

Product offering Evolution	
Evolving	**Mature**
• Product-market Fit is not achieved/soon to be achieved • Main product offerings (value and features) still need to be evolved and valorized, as well as pricing • Customer base & niche not yet established or recently established	• Product-Market Fit achieved (for some time), needs to be maintained • Main product offerings and features established and have proven/constant traction with appropriate pricing models • Client base and niche established (for one or different segments) and growing/expanding to new markets

To establish the differentiation between the types of product offering nine start-ups, the components of product offering and customer base development (Andrew Eifler, 2016) along with product-market fit points were used for this analysis. Given the fact that product-market fit is a process whose main output is to make the right Fit of the product offering towards the right customer segment, Table 7.28. introduces two categories of Product offering Evolution. This Table served as an identification point for the investigated start-ups to analyze their level of product and customer base evolution. Two groups of evolution based on the product offering and customer base evolutions are made to identify start-up profiles – mature and evolving.

The categorization for both groups was done based on product-market fit status, customer niche/base development, product/service, and features development. The mature/evolving start-up offering is presented as the first axis on the mapping on Figure 6.17.

As in the previous analysis of individual start-up case studies, the DM_Optima Scorecard values were used to quantify the digital marketing performance measurement & PMF optimization. The final values for all start-ups are presented and an overall scorecard was made for this type of cross-analysis (with low/high areas as the second axis of Figure 7.12.) The figure below identifies

all case studies, their values, and four maturity levels. The four maturity levels were made based on the start-up's identification of their status and provided data through research.

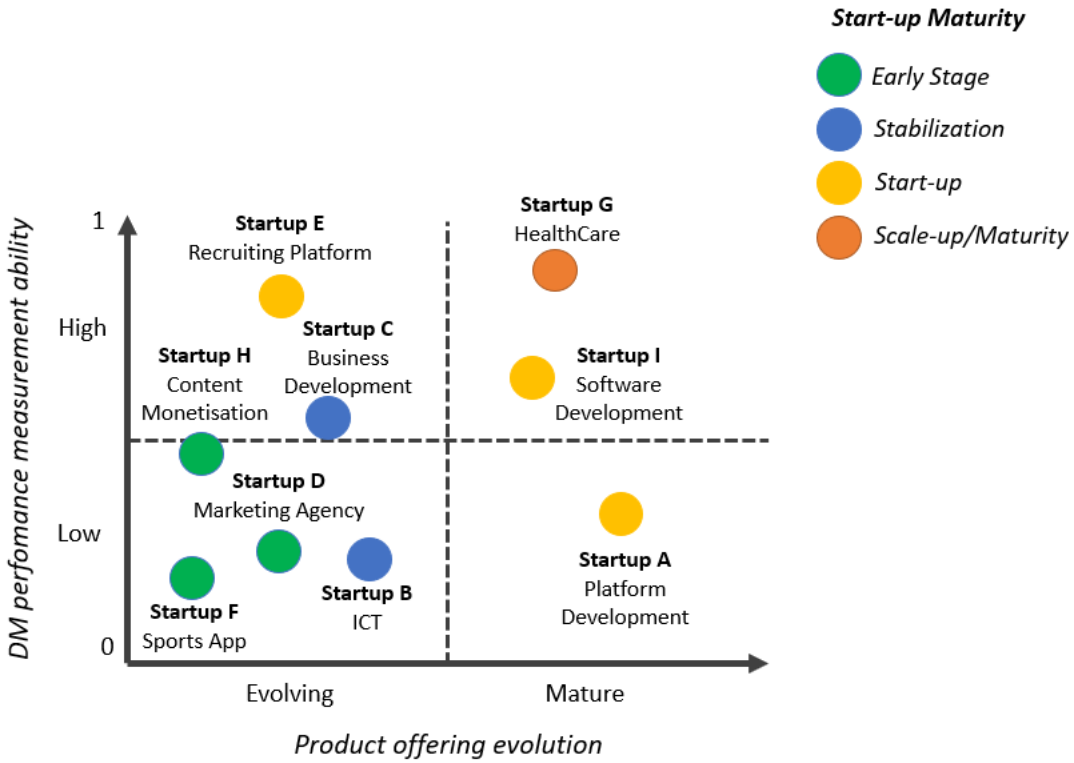


Figure 7.12. Product Offering evolution and Digital Marketing Performance Measurement Mapping (authors elaboration)

Start-ups in the early stages have low levels of DM performance measurement and what is visible is that start-ups that are still developing their product-market fit are partially using performance measurement and have limited ability to capitalize on performance measurement while evolving their product offerings. However, some perform better than others from this group. Start-up H (Content Monetisation) has almost surpassed the threshold of 0,5 points and can be considered an early-stage start-up, evolving its product offering and has medium usage of digital marketing performance measurement. Start-up H has reported high usage of digital marketing for their testing process, specifically market (international) testing, and from the DM_Optima Scorecard, its noticeable that the start-up actively uses digital marketing to test the hypothesis has structured PMF indicators and metrics & conversions. The other two early-stage start-ups (F & D) are in the

quadrant of low DM performance measurement ability, evolving their product offering, and are still developing their approach toward DM performance measurement.

Two start-ups at the stabilization level have digital market performance measurements on medium and low levels. Start-up B is on the lower level of DM performance measurement ability. The team emphasizes that their usability of digital marketing was limited to their Instagram presence and recruitment of new students through this channel, thus their efforts are focused only on a few activities and without a systematic strategy of using digital marketing for PMF optimization.

Start-up E has the highest levels of DM performance ability among all the start-ups evolving their product offering. Start-up reports using digital marketing in testing their product offering, market research, and internationalization. Continuing with this group of start-up maturity, Start-up I is on a medium-high level and Start-up A is in the position of lower ability and mature product evolution.

The Healthcare company (Start-up G) has the highest DM performance ability for PMF amongst all start-ups included in this study. This company reports a systematic structure surrounding data performance management resulting in having an organized and effective system, along with mostly all resources employed.

6.11.3. Digital Marketing Performance Measurement Quadrants

Given the different positions of start-ups' ability to impact PMF through digital marketing performance measurement and their product offering category, the matrix of four quadrants was established to describe each sector and its characteristics (Figure 7.13.).

In the *Starting* quadrant, start-ups are still developing the product-market fit accompanied by low resource availability for digital marketing performance ability. The product offering is still going through pivoting/understanding value proposition, and the main capitalization from performance measurement is in tracking engagement on digital platforms, getting ready for further investments, and using different digital marketing channels to test the audience - make

the audience fit. Although the start-ups usually do not invest in campaigns in this sector (or have low investments), they capitalize from digital marketing in inputs on value proposition/features (Start-up F), audience building and recruitment (Start-up B) and brand awareness and business model inputs (Start-up D).

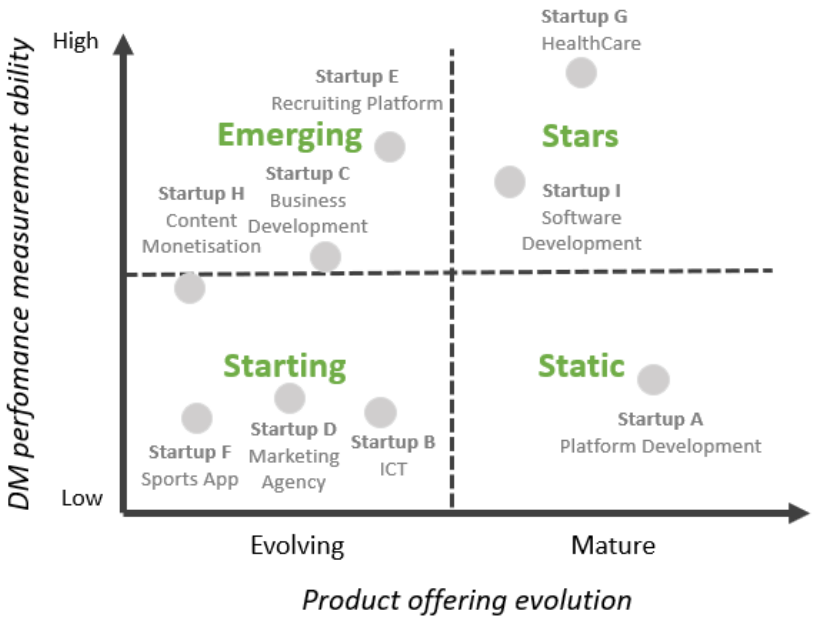


Figure 7.13. Digital Marketing Performance Measurement Matrix (authors elaboration)

In the *Emerging* quadrant, the metrics are fine-tuned and the conversion path of interpretation (from data to insights) is on medium/high levels. PMF is not achieved yet, but the process is on a higher level, or even the PMF was achieved recently (Start-up E). Start-ups have traction (or developing it to higher levels), main product offerings are defined and customer niche is discovered/soon the be discovered on a larger scale. Conversion is the main point of effectively using performance measurement (Start-up E), and referral platforms/programs (and marketing tactics) are used to enlarge the customer base (Start-up C). Based on the insights from digital channels (YouTube), start-ups can use data to pivot their business model (Start-up H).

The *Static* quadrant marks the presence of a mature start-up, with a complete product offering, but with low-performance measurement ability. The start-up, although has established products

and its customer base, does not fully align with digital interaction possibilities or has a satisfying return on investment. Start-up's challenges are customer base enlargement and new product offerings, as well as an insufficient team (or skills) working with digital marketing (Start-up A) and not enough time invested in testing different approaches towards product or market (either through digital or non-digital activities).

In the *Stars* quadrant, the start-up's operations and income are continuously stable. The internationalization process is also established, or start-ups are in a position to do so. The performance measurement ability is on higher levels and all of the components of the measurement process are highly developed (digital experimentation, data interpretation process, and culture are influenced by data and insights). Performance marketing is used as a base of marketing and sales development (Start-up G). In this sector and the Emerging sector, founders use tools and/or plan to use emerging technologies (big data with AI) through platforms and connect them with start-up return on investment (Start-ups G & H). The start-up of this profile demonstrates invested time in testing and experimentation. In start-up I, as they co-develop products with other start-ups, this activity is inevitable and transfers back to boosting testing practices in their internal setting. Testing with this start-up also involves a lot of time invested in interviewing different stakeholders. In start-up G, what was noticed is the experimentation through digital channels is planned as a continuous activity with dedicated time and in some cases, in combination with traditional channels (testing new markets through TV show ads). Similarly with a start-up E, in which the founder emphasizes testing the product offering on different markets and with different experts (frequently involves freelancers to get new ideas, on top of the in-house marketing team).

Start-up Maturity and Digital marketing Performance Measurement for Product-Market Fit

The first proposition of this work connects start-up maturity and digital marketing performance measurement in defining their product-market fit (P1. *Start-ups with higher maturity profiles better utilize the digital marketing performance measurement in defining their product-market fit*).

From the investigated nine case studies, start-ups can be classified into high vs. low performers in using digital marketing performance measurement in defining the product-market fit. The group of high-performing start-ups involves start-ups with higher maturity levels, which also demonstrated high levels of *dynamism* and growth in 3 crucial points. Dynamism is defined through revenue growth, customer base growth, and testing & team development. Growth with client base was reported up to and above 20% from the last quarter, revenue growth between 21-45% and over 45% for the last two years with shorter sales cycles, a stable team with growing capacities, and invested time in testing either through digital channels, or non-digital activities. These high-performing start-ups (*Stars*), in this case study research, have developed a systematical way and ability to use digital marketing performance measurement and impact their product-market fit. In contrast, certain start-ups have maturity from both, start-up and product perspectives, but do not have a systematical way of using digital marketing performance measurement for product-market fit as the other mature start-ups. In this case, the three points of dynamism were on lower levels (revenue, customer growth, and team & testing). This signals a start-up is in a static phase (a low performer) in using the performance measurement through digital marketing, and changes need to be made to assure the proper alignment between resources to further maintain the already established Fit.

Early-stage start-ups (with evolving product offerings) were identified as low-performers and still do not utilize the digital marketing performance measurement for PMF on higher levels, along with having low levels of dynamism. These start-ups are still evolving their offering and can have some limited benefits from digital marketing performance measurement. Some start-ups are crossing the threshold and can be considered entering into medium development. Interestingly, one start-up (Start-up E), which still has an evolving product offering and a higher level of start-up maturity, capitalizes from digital marketing performance measurement in achieving the product-market fit and has reported growth in the three points of dynamism. This can signify that start-ups that are soon to become high performing with a stable, mature offering (along with client, revenue, and team growth), benefit from a systematic approach towards digital performance measurement supporting them in fine-tuning their PMF and experiencing growth.

Thus, in the scope of research from these nine start-ups, the first proposition of this work is partially accepted. Early-stage groups of start-ups are on lower levels and are still not able to fully benefit from digital marketing performance measurement in impacting product market fit. Mature start-ups which are high performers have the systematic approach of implementing digital marketing performance measurement supporting the product-market fit, and complementary high levels of development in three areas of dynamism. However, in this research, some start-ups are mature but do not capitalize on performance measurement and are identified as low performers, along with low levels of dynamism. Meaning that for early-stage start-ups, in order to become more structural and utilize the opportunity of performance measurement for product-market fit, the dynamism elements play an important role as the start-up (and product) maturity itself.

6.11.4. DM_Optima ScoreCards Analysis

Based on the performance measurement of start-ups, cross-case analysis was made to understand the main components of the Scorecards for nine start-ups. The overall scores from all individual start-up scorecards are presented in Table 7.29., which served as a baseline for this cross-case analysis. Each of the four components, along with subcomponents was analyzed through cross-case analysis.

Digital Experimentation

Out of three subcomponents of digital experimentation, the PMF Indicators and hypothesis development seem to be the most developed component within all start-ups, and interestingly with both profiles, mature and evolving start-ups. As these subcomponents are developed within a certain level (low-medium) for all start-ups, it's signalizing that the group of case studies has some organizational practices of using practices for testing their hypothesis and developing basic to medium levels of tracking the indicators for PMF throughout the customer journey. The less developed subcomponent is Technologies supporting data conversions, which counts only two start-ups having this component developed on a higher level. What is also interesting with this component is that even when have higher levels of technologies for data – insights conversions

exist, they are dependent on the analytics software the start-up is using. As exemplified by Healthcare start-up, when the software migration occurs, they also need to change the entire strategy: "*the entire google analytics….they are going through a huge change and they are actually going into a new one which is called GA4, which is the latest google analytics platform and we are changing our whole analysis and analytics platform into GA4…creating everything from scratch again, from the funnels and the goals and everything you know to basically measure and we're going through the analysis of these tools and analytics, what we should have, what we should not have*".

From the aspect of start-ups that have high levels of digital experimentation, what can be pointed out is that the founders in the perspective of these subcomponents do spend time with their team discussing experimentation possibilities (as a planned activity), have a clear PMF metric that represents value and its ideal frequency, and either develop their own methodology how to test or follow several principles as an agile methodology while making the tests.

Digital Marketing Analytics Alignment

The least developed subcomponent in the Alignment of DMAs is having the CRM effective setting and capitalizing on CRM data. As early-stage start-ups are still developing their client base and product offerings, this conclusion seems presumable. With these start-ups, the investment criteria are also undeveloped as well as the identification of how the return on investment was made while using digital marketing. Designing effective metrics is the most developed subcomponent, meaning that even early-stage start-ups try to develop some metric system and connect financial and business KPIs with conversions made on digital platforms. The more mature start-ups are designing their metrics systems to enable advanced insights into business performance and customer behavior. These metrics systems are constantly being optimized and refined based on data and feedback, they can forecast business performance and make data-driven decisions in real-time .

Data Interpretation Process

The structured process of reporting on digital marketing activities and reporting content seems to be the most developed practice with all nine start-ups. Meaning that these start-ups are aware

of the importance of having a structured reporting process and are moving forward to have a general culture of continuous experimentation to make data-driven decisions.

Customer feedback structure is the least developed subcomponent with low-medium levels of development. This component, as well as Technologies supporting data conversions, are the most sophisticated subcomponents of the entire framework because they interlink resources and technologies available to interpret data analytics throughout different functions and departments. With a higher level of maturity, these subcomponents become more developed.

Within the subcomponent of Team Involvement & KPIs, in early-stage start-ups, the KPIs are set individually (by one department) with no coordination among other departments. Interestingly, in Start-up B, even though several departments exist there is no coherent KPIs setting on a start-up level, as no clear communication about this process has been developed.

The higher performing start-ups utilize the subcomponent of KPIs setting not just as a regular team activity, but also as an evaluation practice done in each department and on the start-up level.

Internal Process & Culture

Out of the main four components of this framework, this component is the most developed one. Still, most of the start-ups have teams with some technical skills developed but lack personnel and/or time to implement the activities (6 out of 9 start-ups). The highly performing start-ups meet regularly (weekly), different teams have the awareness of their work and also invest in education on a more structured level (focused on digital marketing). Developing marketing documentation seems to be a practice for most start-ups, but the level differs from a general yearly plan (3 out of 9 start-ups) to a more sophisticated and flexible quarterly plan accompanied by main KPIs (3 out of 9 start-ups).

Table 7.29. Multiple Scorecards analysis values

Start-ups		Start-up A	Start-up B	Start-up C	Start-up D	Start-up E	Start-up F	Start-up G	Start-up H	Start-up I
Component	*Code*	ITC - Platform development	ITC (Group of service)	Business development services	Digital marketing services	Recruitment + Digital Solutions	Sports web platform/ App	Health Services	Content monetisation solution	Software Development
Business Model		B2B	B2B	B2B	B2B	B2B2C	B2B2C	B2C	B2B2C	B2B
Mature vs. Evolving product offering	ME_1	Mature	evolving	Evolving	evolving	evolving	evolving	mature	evolving	mature
Digital Experimentation										
Hypothesis development	DX_1	5.60	2.80	5.60	5.60	11.20	0.00	8.40	5.60	8.40
PMF Indicators	DX_2	4.00	4.00	8.00	4.00	12.00	4.00	12.00	8.00	8.00
Technologies supporting data conversions	DX_3	0.66	0.00	1.32	1.32	1.32	0.66	1.98	1.32	1.98
Digital Marketing Analytics Alignment										
Designing effective metrics	DMA_1	3.60	3.60	7.20	3.60	7.20	3.60	11.00	7.20	7.20
Investment criteria & budget	DMA_2	2.66	2.66	5.32	2.66	5.32	0.00	8.00	5.32	5.32
CRM Capability	DMA_3	2.50	0.00	2.50	2.50	5.00	0.00	5.00	0.00	5.00
Data Interpretation Process										
Customer feedback structure	DI_1	2.00	2.00	2.00	2.00	4.00	0.00	4.00	2.00	4.00
Team Involvement & KPIs	DI_2	5.00	0.00	7.50	2.50	7.50	2.50	10.00	5.00	5.00
Team Reporting	DI_3	1.66	1.66	1.66	1.66	3.32	3.32	5.00	4.98	4.98
Reporting Content	DI_4	2.00	0.00	2.00	1.00	2.00	0.00	3.00	2.00	1.00
Internal Process & Culture										
Culture	IC_1	1.00	1.00	3.00	0.00	3.00	1.00	3.00	2.00	3.00
Team & Skill set	IC_2	2.66	1.33	1.33	0.00	3.00	2.66	4.00	2.66	2.66
Process Documentation	IC_3	1.75	1.75	3.50	0.00	7.00	0.00	7.00	1.75	3.50
Education	IC_4	0.50	1.00	1.00	1.00	1.50	0.50	2.00	1.00	1.50
Creativity	IC_5	0.50	0.50	0.50	0.50	1.00	0.50	1.00	0.50	1.00
SUM		**36.09**	**22.30**	**52.43**	**23.84**	**74.36**	**18.74**	**85.38**	**49.33**	**62.54**

The necessity of creativity while maneuvering digital analytics

The second proposition of this work connects the skill of creativity as an increasingly important skill in data maneuvering, with start-up maturity (P2. *Start-ups with higher maturity profiles have structured methods of developing creativity in their teams as a necessary skill for maneuvering digital analytics*). All nine start-ups mention creativity as one of the most important, must-have skill in this area. Nevertheless, even the most developed ones (*Stars*) don't have organized methods, practices, or activities leading to higher creativity development (Figure 7.14). Ad hoc and periodical (non-structured) organizational activities such as games/challenges, creating relaxed environments, and overall brainstorming is mentioned but, no coherent plans on how to systematically boost creativity skills as learning processes are implemented. Such activities can be an introduction to developing more coherent and structured activities but still do not represent a structured method of developing creativity in teams.

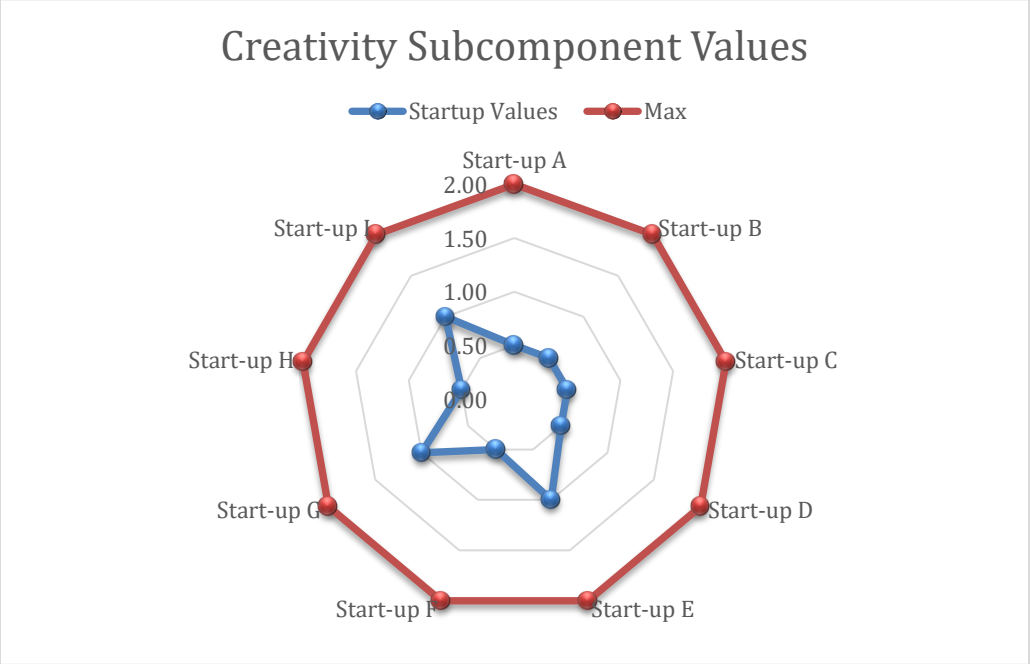


Figure 7.14. Creativity Components results for all start-ups

Thus, through this work, it was established that developing structured methods of enhancing creativity does not correlate with start-up maturity, as none of the investigated start-ups demonstrated structured methods to develop it. What has been established through this work is

that creativity needs to be seen as an important node in data maneuvering (emphasized by all start-ups), and a structured approach toward boosting creativity should be implemented and integrated into the team's work, from strategy development to execution.

6.12. Evolved DM_Optima Framework

After the finalized analysis and findings through the multiple case studies, several components and subcomponents of the DM_Optima Framework have evolved and gained more structure. With the evolved DM_Optima Framework (Figure 7.15.), start-ups are able to optimize product-market fit through different levels of digital marketing performance measurement.

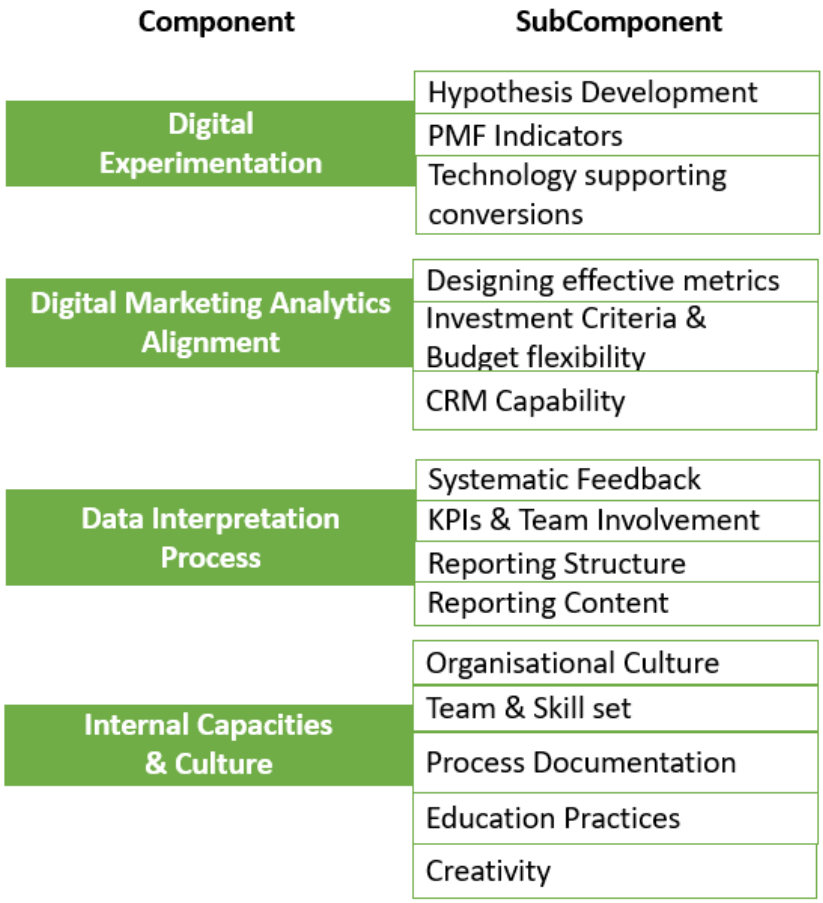


Figure 7.15. Evolved DM_Optima Framework (authors elaboration)

This optimization is done through a systematic set of processes around digital analytics and performance measurement done through digital marketing. Concretely, the framework includes main points (components) of digital experimentation, digital marketing analytics alignment, the structure of the data interpretation process, culture, and organizational context setting around performance measurement (detailed subcomponents descriptions and levels are presented in Table 7.30. at the end of this section).

Compared to the first version of this framework, in the component of digital experimentation, the PMF Indicators were integrated into the Conversion Path subcomponent. As a high conversation rate is the output of successfully organized digital experimentation, the PMF Indicators through the customer journey mark the essential process of identifying and understanding the conversion process and product-market fit achievement (or maintaining). The PMF indicators address the used indicators that start-up personalizes, clearly develops an indicator to follow, and uses comprehensive methods of tracking PMF through digital marketing. Since Technologies supporting data also accompany this process, this subcomponent was moved in this component to have a coherent overview of the digital experimentation component.

In the second component (Digital Marketing Analytics Alignment) the subcomponent of Investment Criteria & Budget Flexibility has been added. As investment in digital marketing activities can be a crucial element in getting higher traffic/engagement, lead generation, or raising brand awareness, it was established that start-ups perform better with priorly set investment criteria and a designed path of how what kind of ROI will digital marketing campaigns have. In this perspective, start-ups can better identify the campaign's objectives, ROI, and performance measurement of activities was easier to gain (not just for ROI, but also based on the objectives and criteria which were previously set). Being that Investments and Budget are connected activities, they were merged into one subcomponent. Budget Flexibility was added as a complementary concept as high-performing start-ups in this study pointed out the ability to react based on data analytics (from invested activities) is followed by quickly (even daily/hourly) reallocating budget on different digital marketing channels.

Another important finding that start-ups stipulate is the importance of having the KPIs developed as a team activity, and the team involvement in setting the timely KPIs as an operation is done by multiple departments (versus solely marketing or sales). This subcomponent has been adapted as its particular setting is influential for the alignment process pointed out through the case studies. In this perspective, as identified by (Järvinen & Karjaluoto, 2015), team involvement, while setting organizational goals with digital marketing performance should be aligned with periodical planning and operations of start-up teams. Thus, the involvement should be a team activity, executed on regular basis and each department should be aligning its goals in line with overall planning and execution.

Reporting Content was added as a subcomponent as it was identified that start-ups that develop reporting as an operation, have the opportunity for higher decision-making practices. Reporting content is a connected process of designing effective metrics, and also represents a systemic, preparatory activity for orderly decision-making. Designing effective metrics is done through the customer journey to support start-ups in defining and tracking the activities that will reach their goal. It is a coherent activity of reporting the metrics and the use of their impact (as established from the practices). The Reporting Content prepares data for decision-making on the operational level. Secondly, with these insights, the marketing teams can use the data to leverage and gain more budget for their activities (HubSpot, 2020). Even more, what was noticed from the case studies is that the impact of clearly communicating digital marketing analytics results in a higher understating of efforts and gains from the digital marketing teams towards other departments and raises the level of importance of work done by marketing teams.

Within the Internal Capacities and Culture, the adapted subcomponent is Team & Skill Set. Skill set should be aligned with the start-up's core business, which follows also marketing personnel. Meaning that a technical person, a digital marketeer, or an analyst, cannot be the same for video content monetization and healthcare, as these are two different types of skills (different methodologies and metrics are used in digital marketing).

Even if the person changes the start-ups and enters a different industry (with the experience of digital marketeer/analyst), they will need time to learn and adapt to the used channels and terminology of digital marketing tools. This indicates that the process of using data analytics will highly depend on the team and internal skills available, previously identified as one of the main start-up challenges (Giardino et al., 2015), but also on how the team will adapt to the constant change of the digital marketing industry.

The data from digital marketing is analyzed and interpreted for insights to personalize marketing actions with current needs and trends. In this perspective, education is not just necessary to understand the current situation on using the data, but also to follow the trends and understand which points of further education should be done, in line with the industry start-up operates in. Thus, Education practices as a subcomponent is adapted to the current start-up's education practices on digital marketing and connected subjects.

Creativity, a new subcomponent was added as it was identified that this particular skill set is highly important. Start-ups recognize the importance of creativity, and need investments to either design creative environments or use different techniques to upgrade team creativity. In this context, the challenge includes having a team capacity to make creative insights, synchronizing the knowledge internally, and advancing towards effective data-driven usage. Therefore, creativity is necessary not just as an individual aspect of development, but as a team effort and joint learning process on how to develop it by combining creativity and data into their fullest capacities.

Table 7.30. DM_Optima Framework - SubComponents and Descriptions of Levels (1/5)

Code	SubComponent	Level	Description
Digital Experimentation			
DX_1	Hypothesis development	0	No processes or methodologies developed
		1	Some repeatable processes are developed, but not a methodology
		2	There is a specifically developed methodology, which is documented and followed
		3	There is a specifically developed and proven methodology for digital analytics (ex. Agile)
		4	Agile and business analysis are used as concepts and represent an integral part of start-up's digital analytics practice
		5	On top of agile and business analysis, the start-up has adopted a continuous testing improvement philosophy
DX_2	PMF Indicators	0	The start-up doesn't possess an indicative method of how to follow their PMF, or any rates indicating customer interaction toward their product
		1	Start-up has developed some indicative methods: survey responses indicating interest, social media engagement rates and website analytics such as traffic, bounce rate, and time on site. Qualitative feedback is collected through surveys and focus groups, ad hoc.
		2	The start-up is using comprehensive methods of tracking PMF through digital marketing, such as: - Conversion rates from digital marketing channels to website sign-ups or purchases, - Customer lifetime value (CLV) from digital marketing channels, - Net Promoter Score (NPS) or customer satisfaction scores from digital marketing campaigns - Customer personas or segmentation based on data from digital marketing channels - A/B testing results indicating which product features or messaging resonates best with customers - Qualitative feedback from customer support interactions, reviews, and social media conversations. Moreover, the start-up follows indicators that are based on a framework (e.g. AARR Framework) or indicator specific for the industry (e.g. retention rate for SaaS), and constantly talks to customers to also get qualitative feedback.
		3	Above using all of the methods, the start-up has a clear metric that represents value and its ideal frequency (e.g. for Airbnb its bookings, are tracked annually), constantly talks to customers and integrates their online/offline feedback on indicators (usually integrated into CRM). Start-up uses advanced machine learning algorithms to personalize digital marketing content or product offerings and has advanced attribution modeling to track the impact of digital marketing channels on revenue or other business metrics.
		4	On top of using the methods from the previous level, start-up works on continuous optimization of product features and messaging based on customer feedback from all available sources. Full integration of customer feedback into the product development process is done, along with customized digital marketing campaigns and experiences based on individual customer preferences and behavior.
DX_3	Technologies supporting data analytics conversion to insights	0	No tools are applied to convert data into insights/start-up is currently thinking of which options to choose
		1	Analyses are done on traffic, clickstream data, web analytics, behavior metrics, and social media analytics (ex. clicks, sessions, social media engagement)
		2	Outcomes, conversion points, and KPIs are defined in line with business goals
		3	Along with data analytics, customer experience analytics tools are implemented for all of the customer segments, customer experience software is used, and tools such as customer journey optimization
		4	Multiple datasets are merged for the analysis, testing, and optimization strategy is defined, behavioral targeting is conducted and different methods focused on calculating the customer lifetime value are used
		5	Predictive analytics are implemented, leveraging AI/ML for insights, and a defined ROI model for optimization across digital and non-digital channels is implemented
		6	Along with the predictive analyses, augmented analytics and other sources of emerging technologies are included in the conversions

Table 6.33. DM_Optima Framework - SubComponents and Descriptions of Levels (2/5)

Code	SubComponent	Level	Description
			Digital Marketing Analytics Alignment
DMA_1	Designing Effective Metric Systems	0	The start-up does not have any metrics systems enabled, nor tracking or analysis of business performance/understanding the customer journey or conversion paths.
		1	The start-up developed a basic metrics system in place, although it is still not well-defined or comprehensive. A basic understanding of customer journey and conversion paths exists, but they are not fully mapped out. The metrics tracked are mostly operational (e.g. website traffic or social media followers, but financial and business metrics are not connected to the metrics). The start-up has some metrics practices on an organizational level, but they are not coherent with the overall practices and/or are done when needed, based on some activities (not as an overall strategy of designing a metric system).
		2	The start-up has a well-defined and comprehensive metrics system in place There is a deep understanding of the customer journey and conversion paths, and they are fully mapped out. The tracked metrics are actionable, timely, and consistent in the application including both, operational and financial/business metrics (e.g. conversion rate, customer acquisition cost, and revenue per customer). Start-up goals are defined and tied to business objectives (methodologies as SMART or RACE are usually used for goals definition).
		3	The start-up has an advanced metrics system in place that leverages data science. The system is able to provide advanced insights into business performance and customer behavior. The metrics system is constantly being optimized and refined based on data and feedback. The start-up is able to use the metrics system to predict and forecast business performance and make data-driven decisions in real-time.
DMA_2	Investment criteria & Budget Flexibility	0	The start-up has little no to little online presence or strategy, and no analysis or investments in digital marketing efforts
		1	The start-up invests in digital marketing activities on an ad hoc basis, without a clear strategy or plan, the focus is on tactics rather than strategy. There is an online presence, but it is not optimized for conversions and Investment criteria and budget flexibility are loosely defined, with little alignment to the overall business strategy.
		2	The start-up has a defined budget for digital marketing activities, and a strategy and plan for digital marketing exists, including optimized website and landing pages that are designed to convert visitors into leads or customers, but lack fully develop investment criteria, reporting and budget flexibility aligned with overall business strategy/ or it may not be reviewed or updated regularly
		3	The start-up is at the forefront of digital marketing innovation and experimentation, investment in digital marketing activities is guided by a willingness to take risks and try new things. The start-up is constantly testing and experimenting with new channels, tactics, and messaging to stay ahead of the competition. Investment criteria and budget flexibility are highly sophisticated, incorporating advanced analytics and predictive modeling, and are updated frequently based on performance data and market trends.
DMA_3	CRM Capability	0	Start-up doesn't use CRM
		1	The start-up uses CRM for delivering and tracking customer experience with sales, CX, and support data. The use of CRM data is used to track customer behavior data to inform website design or email marketing campaigns. The integration of customer feedback (including from digital channels) is used to boost the existing customer experience (e.g. using customer reviews and metrics to identify the experience).
		2	Start-up actively uses CRM for all connected activities, but also to detect the opportunity based on the data filtering to insights and/or connects online and offline data and makes insights. Advanced use of CRM signifies the use of data for identifying (new) product feature opportunities, such as using customer behavior data to identify patterns and trends that inform new product features or using customer feedback to prioritize customers' needs identified through the CRM.

Table 6.33. DM_Optima Framework - SubComponents and Descriptions of Levels (3/5)

Code	SubComponent	Level	Description
Data Interpretation Process			
DI_1	Fostering Customer feedback	0	Currently, no systematic process in place for customer feedback analysis, the start-up is in process of having it organized
		1	Individual customer-level operational and financial data is collected to form a combination of customer profiles (along with digital and non-digital interactions) from some of the marketing channels (still without an omnichannel view)
		2	A detailed journey taxonomy/feedback classification is created, including all the potential drivers of (dis)satisfaction for the customer base. The classification is used to merge all the feedback and classify it to understand customer preference, behavior, and satisfaction.
		3	Multiple departments are involved in collecting, analyzing, and acting on the insights, which in the end results in data-driven insights on product, market, and efficiency.
DI_2	Team Involvement & KPIs	0	No team involvement in KPI development (KPIs are determined by individuals or departments without input from the broader team, there are no team discussions or alignment around KPIs or accountability for achieving KPIs)
		1	KPIs are communicated with the whole team, but not co-developed with the team. Team members may have limited understanding of how their work impacts marketing activities and accountability for achieving KPIs is still primarily at the individual level
		2	All activities, including digital marketing activities, are co-developed with the team, with input and feedback from team members. The team has a shared understanding of how their work contributes to overall (marketing) goals. Team members have some ownership of achieving digital marketing goals, but accountability may still be primarily at the individual level
		3	Co-developed activities with the team and a coordinated plan for the goals and measures are made. The team has a shared understanding of how their work impacts the targeted goals and works collaboratively to achieve them. The team takes collective responsibility for achieving the goals and shared accountability.
		4	Digital marketing activities are regularly reviewed as planned activities along with regular updates based on feedback and data analytics. The team has established a culture of continuous improvement, using data from digital marketing activities as a tool for learning and development. Accountability is shared among team members, who work collaboratively to identify and implement improvements.
DI_3	Team Reporting	0	Senior management has no requests for reporting and doesn't meet with the digital marketing team to understand reporting for DM activities
		1	Senior management has requested reporting, but no clear criteria/structure on how to report and rarely meets to understand the results
		2	Senior management established clear reporting criteria (monthly reports, constant feedback), but for certain experiments/actions
		3	Senior management has established a general culture of continuous experimentation, regularly meets to understand the reports, and makes a decision based on the results
DI_4	Reporting Content	0	No reporting or data collection in place or ad hoc data gathering, with no regular reporting including metrics or KPIs
		1	The content of the report doesn't include effective/actionable metrics or includes only engagement metrics with no connection to ROI efforts of digital marketing activities
		2	The content of the report impacts the decision-making process based on reliable and effective data. Data is collected and reported regularly, with consistent intervals (daily, weekly, monthly). ROI analysis is conducted for each channel or campaign, providing a clear understanding of which activities are driving revenue/growth and which are not. Dashboards or visualization tools might be used for easy interpretation of data. Reports are shared with relevant stakeholders, including executives and team members, to ensure everyone is aligned on goals and progress
		3	Reports are used extensively for decision-making, with data-driven insights driving strategic planning and tactical execution. Reports include analysis of effective metrics, ROI, with data-driven insights and recommendations. Visualization or dashboards are interactive and customizable for specific stakeholders. Reports are used not solely used for decision-making, but along with algorithms provide recommendations on which activities are likely to generate the greatest ROI. Reports are used a crucial part of the decision-making process with stakeholders relying on them for strategic and operational planning.

Table 6.33. DM_Optima Framework - SubComponents and Descriptions of Levels (4/5)

Code	SubComponent	Level	Description
Internal Capacities & Culture			
IC_1	Culture & Cooperation	0	There are no meetings between the departments (ex. sales, digital communication, CRM), nor talk/share the learnings from the insights
		1	Different departments meet for some activities, (e.g. campaign scheduled and checking the progress of the digital marketing performance). Basic processes are in place for communication and collaboration, and there is some cross-functional interaction, but it is ad-hoc and limited.
		2	Different departments meet monthly/quarterly (ex. sales, digital communication, CRM) and talk/share the learnings from the insights. Established processes and guidelines for communication, collaboration, and knowledge sharing are in place and managed between teams. Communication is regular, with scheduled meetings and open lines of communication.
		3	Departments meet regularly (weekly/bi-weekly), and different teams have the awareness of their work and share a coherent view of digital marketing performance, and how it fits into current business operations. Cross-functional interaction is highly integrated, with teams working together regularly, and meetings are structured, and inclusive of all team members. Communication is constant, with ongoing updates and feedback between teams. A high level of trust and transparency exists among team members, including leadership.
IC_2	Team & Skill set	0	The start-up has no team roles connected to digital marketing activities
		1	The start-up has team members (or partial roles) but lacks technical personnel for all digital marketing activities. The team is aware of the importance of data-driven decision-making and is starting to collect and analyze data.
		2	Start-up has the technical and marketing skills, is able to adapt to changes in the digital marketing landscape, and implements new techniques, but lacks time to implement and track DM performance measurement, or lacks more team members.
		3	Start-up has all the necessary skill sets in their team for the data interpretation process. The team is highly data-driven and regularly collects, analyzes, and applies data to drive marketing decisions. The team is able to innovate and experiment with new digital marketing technologies and techniques, staying ahead of industry trends.
IC_3	Internal Process Documentation	0	There is no documentation about marketing activities
		1	Documentation and strategy are made during certain digital marketing activities
		2	A general strategic plan is made for marketing activities in line with overall business activities and is done on annual or semi-annual updates. The plan includes high-level goals, target audience, messaging, and basic channel strategies.
		3	A yearly marketing plan (or quarterly plan) exists detailed documents on quarterly digital marketing strategies used (ex. SEO, Social Media) accompanied by main KPIs, objectives, target audience, messaging, and channel-specific strategies
		4	Advanced marketing planning process with comprehensive documentation and monthly updates to the marketing plan. Continuous updates to the marketing plan are based on real-time data and feedback. The plan includes detailed objectives, KPIs, target audience, messaging, channel-specific strategies, and contingency plans for potential changes in the market or customer needs.
IC_4	Education	0	The start-up team doesn't consider education important nor has any activities related to education themselves through any sort of activities (not even following blogs/social media etc)
		1	The start-up team follows social media blogs (non-paid), and other online sources
		2	The start-up team subscribes to online courses, or occasional training sessions or workshops.
		3	The start-up team has paid for education and mentoring from different digital marketing mentors/programs or regular training and education sessions. Knowledge sharing and collaboration between team members are encouraged and facilitated.
		4	The start-up team has monthly-based continuous education (with agile principles). Knowledge sharing and collaboration are ingrained in the team's culture.

Table 6.33. DM_Optima Framework - SubComponents and Descriptions of Levels (5/5)

Code	SubComponent	Level	Description
IC_5	Creativity	0	Start-up doesn't consider creativity an important skill and doesn't have any plans of developing it
		1	Start-up considers creativity important and has some practices, mainly through sporadic use of some activities, occasional brainstorming sessions, or team meetings held to share ideas.
		2	Start-ups have some ad hoc activities (such as courses) on how to boost creativity in teams. Some experimentation with new techniques or approaches occurs, but still not systematic and not a joint learning process.
		3	Techniques such as design thinking or customer journey mapping are used to encourage creative problem solving and team members are encouraged to take risks and experiment with new approaches. In the start-up, regular training or workshops on creativity are offered to team members.
		4	The team has a dedicated creative team or individual responsible for fostering innovation. Creativity is integrated into all aspects of the team's work, from strategy development to execution. Regular training or workshops on creativity are offered to team members, and creativity is recognized as a key competency for team members

8. CONCLUSIONS

8.1. Thesis Contributions & Framework Applicability

The importance of extended digital marketing impact on start-ups growth areas

Start-ups are a type of business entity that continuously uses experimentation to design their business models and understand market needs. Contrary to companies, organizational flexibility allows start-ups to have a rapid change of business course and use different ways to experiment and boost their growth. One of the ways start-ups communicate and experiment with customers is digital marketing, nowadays perceived as more than just a mediator of digital presence on the market, but following its extended impact, an engine of growth in several start-up activities. As start-ups face difficulties of low resources, and pressure to develop products rapidly, mapping the extended influence of digital marketing on key activities can help start-ups to impact a number of activities at the same time.

As this work's purpose was to identify how digital marketing supports start-up growth, the first research question guided the investigation to identify how digital marketing supports start-ups in growth through key activities and areas, beyond marketing in sales. After a systematic literature review connected with industry examples, this research identifies 15 different growth drivers (from a product, market, team, and financial perspective) in which digital marketing support start-up growth. This led to the first result of this thesis, the 15 growth drivers are presented in the Macro-dynamic framework for encompassing the digital marketing influence in

start-ups. Growth drivers range from product-market fit identification and partnership development, to raising investors' awareness. Along with the growth drivers, digital marketing strategies & tactics supporting the growth have also been presented in the Macro-dynamic framework.

The Macro-dynamic framework contributes to the current start of art from two perspectives. The work contributes to the growing number of research on digital marketing and start-ups. Throughout the literature review it was established that the interconnection of mapping digital marketing to influence start-up growth was lacking theoretical coverage, this work contributes by enlarging this subject.

From a managerial perspective, the Macro-dynamic framework can be practically used when start-ups identify in which areas and key activities, different digital marketing strategies, and tactics can be used to impact the growth of specific activity.

Matching Product-market Fit and Digital Marketing Activities – A Bond Enabling Experimentation

Product-market fit is one of the start-up growth drivers supported through digital marketing. Reaching and maintaining the product-market fit is also one of the major milestones for each start-up/company on the market. As this is fairly a new concept in industry and literature, there is a need to explore and understand how the Fit is made. When combining digital marketing strategies, start-ups can get insights for either developing the product, market, or other aspects of how different conversions are made in the digital context. However, there is an evident lack of understanding of which activities can be connected with product-market fit through digital marketing, and how can start-ups benefit from these connections. Identifying and understanding these actions can help start-ups to plan their activities, use specific digital marketing activities to discover how the Fit is made, and ultimately optimize the activities by tracking the performance of each activity.

In connection with the second research question of this work, a set of activities leading to product-market fit along connected to the direct support digital marketing can offer was identified (PMF Activities & Digital Marketing Support Identification). The jobs that need to be done from digital marketing and operational opus were also identified along with which metrics to use and monitor this process. Based on this analysis, through the multiple case study with nine start-ups, it was identified that start-ups use digital marketing to develop their value proposition, product features, boost new product development processes, and even pivot. More specifically, from the market side, the analysis led to discovering how start-ups use digital marketing to understand and adapt to the niche market (e.g. through campings, SEO, videos), have "audience validation" prior investing, develop trust (e.g. developing personalized content), scan competition, and understand trends (e.g. through Analytics, Google trends, Youtube). Interestingly, customer education was identified as one of the engaging points on which start-ups of all maturity levels develop. Videos, blogs, newsletters, and technical and how-to articles are used for customer education on a product or industry. Videos in general are highly used as a tactic for generating leads and brand building. What was also established is that start-ups actively use digital marketing to test and experiment on several points of business models through digital marketing. A specific "conversion and experimentation area" is identified as a space in between the concepts of product and market, which connects both, but is also a stand-alone section in which processes and outputs of digital interaction are tested and established. In this specific bond of digital interaction and experimentation, start-ups test product & market points (e.g. through UX), business models & leads (e.g. virtual simulators), conversion metrics, and initiate product internationalization. Their goal is either to get new conversions or test for market discoveries, especially in international markets.

Through the nine case studies, it was identified that digital marketing is sometimes used as an unorthodox way of making various conversions and developing or upgrading, either the product or market part of Fit. This testified to the point that start-ups use digital marketing as a digital space to make different experiments connected to the calibration of their Prodcut-Market Fit.

Within this section, this work contributes to the literature in a focused way of connecting product-market fit and digital marketing, along with examples of what kind of different tactics and strategies are used by start-ups to impact their product-market Fit.

Product-Market Fit Optimisation through Digital Marketing Performance Measurement

As different emerging technologies develop, start-ups and companies will continue to automate digital processes and seek to base their decisions via data analytics insights. How start-ups design this process of growth by using digital marketing can change the overall outlook of how the value of digital marketing is acknowledged, as it also becomes part of the product development in a cocreation process (Jung and tom Dieck, 2017). Although much is known about digital marketing usage, the way how digital interaction on marketing channels is interpreted within start-ups still lacks a full understanding. One of the reasons is that this process is specific for each company or start-up. Depending on which resources and digital presence start-ups have, this path changes. Especially as start-ups opt for quick and more agile approaches, this process is in constant change and needs understanding. The interpretation process (from data to insights) starts with digital analytics (Camilleri, Mark, 2019), designed to make conversions, and is associated with the digital marketing performance measurement scope of research. The current examples of how performance measurement is done usually are focusing on data analysis from social media (Barcoe & Whelan, 2018) and overall web analytics (Järvinen & Karjaluoto, 2015).

However, the lack of digital marketing performance measurement in start-ups is identified. As start-ups are also operating with a different set of resources and knowledge combined to achieve and maintain their product-market fit, it seemed necessary to investigate this bond and deepen the current state of the art. From the industry perspective, digital marketing performance measurement for start-ups will help start-ups understand their current position and inform them on the next steps needed for digital marketing performance optimization.

Thus, to answer the third research question and investigate how can start-ups use digital marketing performance measurement to optimize their product-market fit, the DM Optima framework is proposed. The DM_Optima framework encompasses insights from the Macrodynamic framework, product-market fit activities, and digital marketing performance measurement. As digital marketing performance measurement is an interconnected process between different activities in start-ups, to identify and quantify the process a Scorecard as a strategic management tool was used. The DM_Optima Scorecard captures start-ups' ability to design four components of digital marketing performance measurement for PMF optimization: Digital Experimentation, Digital Marketing Analytics Alignment, Data Interpretation, and Internal process & Culture. The framework was demonstrated on nine start-ups. To capture the actual start-up usage & behaviors around digital marketing activities, the participating start-ups had different maturity levels, and distinct curves of development for product-market fit, product offerings, along with different business model types.

The findings through DM_Optima suggest that high-performing start-ups use digital marketing to optimize their product-market fit by clearly defining their PMF indicators (by following specific indicators created by them or using industry develop indicators), design their own or use agile methodologies to test the hypothesis through digital channels, and actively use advanced (and emerging) technologies to support the data conversion. These start-ups also design effective metrics systems, jointly set their KPIs, and have developed investment criteria and flexible budget policies. Their teams are skilled professionals and they design their culture to foster continuous experimentation. Another intriguing finding is that digital marketers and analysts need to have specific knowledge based on the industry they are working in because strategies and metrics used in one industry (e.g. content monetization) have different applications than other industries (e.g. sports apps). Thus, when shifting into different industries, experts need time to adapt to new environments (analytics, software, strategies). Consequently, when connecting the founder's experience with start-up growth, what was noticed is that start-ups that already had a previous experience of being founders, or worked in verticals similar to their current start-up industry, seem to be more proactive in designing data-driven environments. Some of the decisions (and

activities) made in the current start-up were a reflection of the previous experience and the way they design the team, set the culture, was also a reflection of previous experience.

Start-up maturity correlation with digital marketing performance measurement ability and creativity

This study also aimed to test whether there is a relationship between the start-up maturity profile and its ability to use digital marketing performance measurement in PMF optimization. The mature, high-performing start-ups which systematically develop performance measurement practices, benefit from these connections and continuously optimize their processes. Consequently, the high-performing start-ups also have the three points of dynamism (revenue growth, client growth, and team & testing) developed on a higher level, as opposed to mature start-ups which don't benefit from DM performance measurement and also have lower levels of dynamism. From the aspect of early-stage start-ups and their performance measurement practices, interestingly, the analyzed start-ups have developed some ways of using performance measurement practices. Although on lower levels, the practices are mainly connected to developing internal processes, basic metrics systems, and a culture toward a data-driven environment. For start-ups that are in early maturity stages, the path of DM usage is not systematically structured, but some (limited) insights and optimization can be made and support them towards higher maturity levels. These findings suggest that this structured performance measurement through digital marketing enables start-ups to make data-driven decisions that help them achieve/ maintain the right Fit, while in parallel developing their teams & testing practices, customer, and revenue growth.

Moreover, based on the result of the nine case studies, their performance measurement, and levels of product offering maturity, four quadrants are made to identify different levels of digital marketing performance measurement ability (Starters, Static, Emerging, and Stars quadrant). The start-ups located in each quadrant can identify their position toward digital marketing performance ability, understand which are the point of higher performance in quadrants, and which actions can be made to upgrade performance.

Furthermore, this investigation also aimed to discover the relationship between start-up maturity and developing creativity as a skill for better data maneuvering. In this research, start-ups of all maturity agree creativity is a highly important skill in data-driven environments. However, the findings suggest that not even the most developed start-ups have established continuous practices of boosting creativity. Even with the high-performers, the Marketing Managers identified creativity as extremely important, without a currently systematic way of effecting it and time to do it, but with a proactive attitude to make some alterations and affect the development. This testifies to already made conclusions of start-ups struggling with resources and time (Giardino et al., 2015), including time for training or other types of education practices. The added point here is identifying creativity is an extremely important skill, especially for data maneuvering, for which development time needs to be allocated.

Thus, this work contributes to a growing literature on start-ups and digital marketing usage, specifically on the product-market fit establishment. Throughout the work, its explored which tools start-ups use to support product-market fit (for early-stage start-ups) and what are different methods of digital marketing used to maintain the fit (for mature stages). The thesis has also explored different ways of classifying start-ups in points of their overall maturity (including maturity in product offering) and main caracteristings connected to each level.

Through the case studies, it was demonstrated that the DM_Optima can be used with diverse start-up profiles. With this kind of framework, start-up founders and marketing managers have a tool designed to support decision-making based on digital marketing analytics, impact the process of product-market fit, and optimize needed points of development from an internal organizational perspective.

This thesis tries to bridge three complementary and contemporary concepts digital marketing, start-ups, and product-market Fit. The intersection made with these three concepts in this work is made within two practical frameworks. The Macro-dynamic framework presents how digital marketing influences start-up growth in different key activities and areas. And

secondly, the DM_Optima framework helps start-ups to shape their processes leading to systematic usage of digital marketing performance measurement and impacting the product-market fit. As the product-market fit is a fluid, intuitive process, the purpose of this thesis was to try and support this endeavor that each start-up needs to have and maintain. However, this process is also influenced by many other elements starting from all the non-digital activities which are essential in the product-market fit establishment. Nevertheless, this thesis attempts to further unveil this crucial (and individual) start-up process while trying to contribute the current academic and practical overview of how digital marketing can help start-ups in optimizing their product-market Fit.

8.2. Limitations

The first limitation of this work is connected to the aspect of investigating extended marketing impact on start-ups. As this step was done to determine all possible areas on how digital marketing supports start-ups to grow, it was a macro-view, meaning there was no detailed focus in the first part of the research on all 15 selected areas. Later on, as Prodcut-Market Fit was selected as the next step in this research (along with internal process development and culture), the research of impact got structured. In this perspective, the research got limited by only focusing of Prodcut-Market Fit, whit other growth drivers not systematically investigated.

Another limitation is that the perspective of product-market fit was seen only through digital marketing and several connections with non-digital elements were identified. Although the systematic approach was conducted in mapping the digital marketing impact on start-ups, and product market fit, the other especially important part of product-market fit, the non-digital was only identified through certain activities. This limits and, at the same time, positions this work only in the scope of digital marketing and performance measurement through digital interaction and optimizing the product-market fit.

The DM_Optima framework's role is to become a structural concierge for the efficient design of a data-driven environment in the start-up. However, it is only focused on the internal process used to identify the behavior and modus operandi of start-ups in the context of digital marketing influence on product-market fit and performance measurement. The research was not focused on external factors influencing start-ups and data analytics nor the operations of how data flow from digital marketing is connected with other start-up stakeholders (besides customer interactions). As the focus was intended to be precise and have a deeper outlook on digital marketing analytics interpretation in line with performance measurement of product-market fit, the components impacting these interconnections were inspected and aligned in the DM_Optima.

As this work was made within the multiple case study research, the findings offer an understanding of how start-ups use digital marketing for their growth in the development of product-market fit and performance measurement ability, but the results are limited to nine case studies. The main goal was to test the framework's applicability, understand the digital marketing movements start-ups have within the product-market fit context and design main components based on the identified results. Nevertheless, to gain more data and identify trends for various start-up groups and profiles, more than nine start-ups need to be analyzed. For generalization of the results, a larger start-up population needs to be investigated, which is suggested as one of the future developments of this work.

8.3. Future developments

In a certain aspect, the limitations of this work present an opportunity for further developments in different research paths. Starting from the Macro-dynamic framework and 15 identified growth drivers, only product-market fit got a thorough investigation in this work (with internal process development and culture as complementary growth drivers). However, focused research on the remaining growth drivers can be proposed to investigate a digital marketing correlation between digital marketing and for example partnerships development or raising investor awareness.

As this work was focused on investigating the digital marketing aspect of impact on start-ups with some level of non-digital activities identification but not through a systematic approach, an interesting further step would be to investigate both aspects and see how the complementarity of digital and non-digital methods impacts the product-market fit for a certain group of start-ups.

To have widely confirmed DM_Optima framework results, another point of future developments can include a survey made and shared among different groups of start-ups. This action could discover what are the main trends in procedures of tracking performance via digital marketing and which kind of approach and results from different kinds of start-up profiles have, on a larger scale.

Another point of further research proposition is to investigate start-ups specify from one industry, such as health, education, or finance (health-tech, ed-tech, fintech) and to see the activities and trends start-ups from a more focused industry have in using digital marketing to impact their product-market Fit. This could also be a multiple case study research with conclusions specific to the industry in question.

Moreover, this kind of research can be done internationally. This type of research could involve and analyze start-ups in different countries to identify similarities, differences, and patterns that may emerge across national boundaries. The cross-national research could be useful to understand which different practices start-up use in their markets and which components might be similar/different across different national (and international) contexts.

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Appendix A.

Product-Market Fit Optimisation via Digital Marketing

The prospects of digital marketing in today's digital age consist of different growth possibilities for start-ups, including the support for the product-market fit achievement. This research is focused on analyzing **how digital start-ups use digital marketing to support their process of product-market fit optimization.**

As your startup has already expressed interest in joining this research, we would like to truly thank you for your time and contribution to our study! Each startup participating in this research will receive an individualized report on their digital marketing performance metric systems along with our recommendations and insights.
This study is part of a Ph.D. research with a team of researchers from the UNIDEMI Research Center – Industrial and Mechanical Engineering Department, NOVA School of Science and Technology.

Instructions
This Questionnaire includes demographic data along with 12 multiple choice questions and will take up to 10 minutes to complete. Please add responses and tick your answers in the boxes below the questions.

Demographic Data			
Start-up Name			
Start-up Maturity	□ Pre start-up	□ Start-up	□ Post start-up
	Pre-startup stage - ideas are developed and need to be validated, start-ups in the quest for financial and human resources. Entrepreneurial activities are carried out by founders or short-term hires.		
	Startup stage: prototypes are developed and experimented with; start-ups have the problem–solution match (the evidence that a product/service, solves a customer's problem). Some revenue is generated, but not necessarily over the break-even point.		

	Post-startup stage: products are extended, and start-ups achieve the product-market match. The start-up is expanding its customer base, the revenue models are predictable and scalable. A hierarchical structure is formed within the start-up.		
Start-up Age			
Product type			
Business Sector	□ B2B	□ B2C	□ B2B2C
Number of employees			
Interviewee role			
Start-up experience (years)			

Are you actively tracking and measuring your performance in digital marketing & analytics?

- □ Yes
- □ No

What is the current percentage of budget allocation for digital marketing in your start-up:

- □ Less than 5 % (of the marketing budget)
- □ 6-10 %
- □ 11-20 %
- □ 21-40 %
- □ 41 % or more

What is your revenue growth in the last 2 years:
(for early-stage start-ups (below 2 years) please choose the option Other and indicate your growth in months)

- □ 0 – 5 %
- □ 6 -10 %
- □ 11 - 20 %
- □ 21 - 45 %
- □ 46 % and above
- □ Other:……..

Customer base & Sales

1. **In the last 6 months, customers from the same niche/segment approach you with a problem you can solve?**

☐ No, they have another problem
☐ We can solve part of the problem
☐ Yes, we have a complete solution to their problem
2. In the last 6 months, what's the status of your customer base?
☐ We have a decreasing trend of new customers
☐ Our customers base stayed the same
☐ Our customers base increased by 10 to 20 %
☐ Increased by 20 % and more
3. In the last 3 months, how are your sales cycles?
☐ We don't track sales cycles
☐ Have been higher than 20 % and more
☐ Have been higher than 10 % of the time
☐ Stayed the same
☐ Have been shorter for 10% of the time.
☐ Have been shorter by more than 20 % or more ☐ Other: …….
Experimentation & Data Analytics
4. How do you perceive your current use and benefits of digital marketing analytics (eg. web, social media analytics)?
☐ Level 0 - We do not track digital marketing analytics from our digital marketing channels/tools, we don't see the possible benefits
☐ Level 1 - We rarely use the digital marketing analytics, but we are aware of possible benefits and are planning to invest more resources
☐ Level 2 - We use several digital marketing tools and tactics and track our analytics, and have gained only minor benefits from the usage
☐ Level 3 - We use digital marketing tools, track our analytics, and we are mostly satisfied with the usage and gained benefits from the usage

□ Level 4 - We use digital marketing tools and analytics; we are exceptionally satisfied with the usage and gained benefits from the usage		
□ Other: …….		
5. Please indicate which metrics do you currently follow:		
□ Customer retention	□ Churn rate	□ Number of subscriptions
□ Social media engagement	□ Number of product users/subscribers	□ Number of new/returning customers
□ Website Pageviews	□ Number of app downloads	□ Number of unfiltered leads
□ Total marketing spend	□ Referral program growth	□ Customer Lifetime value
□ Net Promoter Score	□ Survey on "how disappointment" would users be without your product or other similar questions	□ Other:……..
6. What kind of non-digital techniques did you use to formulate/maintain your product-market fit?		
□ Focus groups		
□ Interviews		
□ Fairs/Pop-ups		
□ Stakeholder/Partners meetings		
□ None		
□ Other:……..		
7. How is your customer feedback process organized?		
□ Level 1 - Currently, we don't have a systematic process in place for customer feedback analysis, we are in process of having it organized		
□ Level 2 - We collect individual customer-level operational and financial data forming a combination of customer profiles (along with digital and non-digital		

	interactions) from some of our marketing channels (still without an omnichannel view)
□	Level 3 - We create a detailed journey taxonomy/feedback classification, including all the potential drivers of (dis)satisfaction for the customer base. The classification is used to merge all the feedback and classify it in order to understand customer preference, behavior, and satisfaction
□	Level 4 - Multiple departments are involved in collecting, analyzing, and acting on the insights, which in the end results in data-driven insights on product, market, and efficiency.
8.	**How do you develop hypotheses, define problems & opportunities, analyze and provide insights into digital analytics?**
□	Level 1 -We don't have any specific methodology
□	Level 2 - We have some repeatable processes, but not a methodology
□	Level 3 -We have developed our own methodology, which is documented and followed
□	Level 4 - We have developed a proven methodology for our digital analytics (ex. Agile)
□	Level 5 - We use agile and business analysis as the concepts as an integral part of our digital analytics practice
□	Level 6 – On the top of agile and business analysis, our startup has adopted a continuous testing improvement philosophy
	Internal capacitates & organization
9.	**What kind of organizational culture do you have set related to cooperation and sharing of data analytics insights?**
□	Level 1 - We don't have meetings between the departments (ex. sales, digital communication, CRM), nor talk/share the learnings from the insights
□	Level 2 - Our departments meet when we have some activities as campaign scheduled and we want to check the progress of our digital marketing performance
□	Level 3 - We have meetings between the departments once or twice a year (ex. sales, digital communication, CRM) and talk/share the learnings from the insights

□ Level 4 - Our departments meet regularly (monthly/bi-weekly), different teams have the awareness of their work and share a coherent view of digital marketing performance
10. What is included in your marketing documentation?
□ Level 1 - We make our documentation and strategy while we do certain activities
□ Level 2 - We made a general strategic plan for marketing activities in line with overall business activities which is done yearly, for the upcoming next year
□ Level 3 - We have a yearly marketing plan, detailed documents on quarterly digital marketing strategies used (ex. SEO, Social Media) accompanied by main KPIs
□ Other:…….
11. Please indicate which kind of technologies do you use to support the data analytics conversion to insights?
□ Level 1 - We are not applying any tools to convert data into insights / we are currently thinking of which options to choose
□ Level 2 - We are analyzing traffic, clickstream data, web analytics, behavior metrics, and social media analytics (ex. clicks, sessions, social media engagement)
□ Level 3 - We are implementing our strategy with KPIs, and conversion points according to our defined business goals
□ Level 4 - Along with data analytics, we have implemented customer experience analytics tools for all of our customer segments, use customer experience software and tools as customer journey optimization
□ Level 5 - We merge multiple datasets for analysis, have a defined testing and optimization strategy, conduct behavioral targeting, and use different methods focused on calculating the customer lifetime value
□ Level 6 - We implement predictive analytics, leverage AI/ML for insights, and have a defined ROI model for optimization across digital and non-digital channels
12. How would you describe your senior management involvement in digital marketing activities and reporting?
□ Level 1 - Senior management has no requests on reporting and doesn't meet with the digital marketing team to understand reporting for DM activities
□ Level 2 - Senior management has requested reporting, but no clear criteria/structure on how to report and rarely meets to understand the results

□	Level 3 - Senior management established clear reporting criteria (monthly reports, constant feedback), but for certain experiments/actions
□	Level 4 -Senior management has established a general culture of continuous experimentation, regularly meets to understand the reports, and makes a decision based on the results

Thank you for sharing and contributing to our study!

Appendix B.

AHP Questionnaire	
The prospects of digital marketing in today's digital age consist of different growth possibilities for start-ups, including the support for the product-market fit achievement. This research is focused on analyzing how digital start-ups use digital marketing to support their process of product-market fit optimization. As you have been identified as one of the ecosystem experts whose insights will largely contribute to the research development, we would like to thank you in advance for your time and effort! In this research, our focus is on the process of Product-Market Fit, which means being in a good market with a product that can satisfy that market" (Andreessen, 2015). Product-market fit also signifies a breakpoint when a product/service gains enough traction and is validated by the market, either by an early-stage start-up or an already established start-up launching new products. The goal of this Questionnaire is to identify the importance of each specific component that helps start-ups to reach and maintain their Product-Market Fit from the aspect of digital marketing performance measurement. In the first part of the document, the components impacting the process of optimizing Product-Marketing Fit through digital marketing are listed and explained. In the second part of the document, the comparison of the components based on their importance is made. The overall time spent on this Questionnaire is around 10-15 minutes. Your contribution is very much appreciated!	
List of Components	
Hypothesis development	Start-ups practices and methodologies on hypothesis development as foundations of testing and experimentation process
Product-Market Fit (PMF) Indicators	Developing and tracking indicators specifically for the Product-Market Fit process (e.g. Conversion rate, Retention rate).
Designing effective metrics	Developing an effective metric system throughout the overall start-up setting
Process Documentation	Having a documented process and strategy around marketing activities (yearly plan, quarterly etc.)
Team Involvement & KPIs	Developing KPIs (overall) as an individual or team activity.
Investment criteria & Budget Flexibility	Developing criteria and having budget flexibility for marketing investments.
CRM Capability	Usage of CRM for insights based on start-up activities (internal, sales, marketing, etc).

Customer feedback structure	Systematic structured customer feedback analysis enabling direct insights into customers
Technologies used to support data conversions	Technologies and data platforms used to analyze data analytics conversion to insights - from web analytics, and social media, to more advanced options of predictive analytics (AI/ML).
Reporting Process	Senior management establishing a continuous process of experimentation and reporting on digital marketing activities.
Reporting Content	Making reports (from digital marketing activities) to impact the decision-making process based on reliable and effective data.
Culture & Cooperation	Cooperations and communication practices between different departments on digital marketing activities (eg. Frequency of meetings and communication between marketing and sales departments).
Skill Set	Start-up skills and staff availability for interpreting data from digital marketing platforms (e.g. Marketing professionals, data analysts)
Education	Practices focused on the continued education of staff on digital marketing and connecting subjects.
Creativity	Practices focused on boosting start-up team creativity

Please rate the importance of the first component -
in a singular line, bolded on the left side, compared to other components listed on the right side (by bolding or crossing your preferred answer). For example, if you think that Hypothesis Development is extremely more important than PMF Indicators, you would bold/mark numbers 9 or 8, for much more and more important you would mark 7, 6, or 5. From moderate to slight importance, you would mark 4,3 or 2, and if you think they are of equal importance you would mark 1).

Component	Extremely Important		Much more Important		More Important	Moderate Importance		Weak or Slight Importance	Equally Important	Component
Hypothesis development	9	8	7	6	5	4	3	2	1	PMF Indicators
	9	8	7	6	5	4	3	2	1	Designing effective metrics
	9	8	7	6	5	4	3	2	1	Process Documentation
	9	8	7	6	5	4	3	2	1	Team Involvement & KPIs
	9	8	7	6	5	4	3	2	1	Investment criteria & Budget Flexibility
	9	8	7	6	5	4	3	2	1	CRM Capability
	9	8	7	6	5	4	3	2	1	Customer feedback structure
	9	8	7	6	5	4	3	2	1	Technologies supporting data conversions
	9	8	7	6	5	4	3	2	1	Reporting Process
	9	8	7	6	5	4	3	2	1	Reporting Content
	9	8	7	6	5	4	3	2	1	Culture

	9	8	7	6	5	4	3	2	1	Skill set
	9	8	7	6	5	4	3	2	1	Education
	9	8	7	6	5	4	3	2	1	Creativity
PMF Indicators	9	8	7	6	5	4	3	2	1	Designing effective metrics
	9	8	7	6	5	4	3	2	1	Process Documentation
	9	8	7	6	5	4	3	2	1	Team Involvement & KPIs
	9	8	7	6	5	4	3	2	1	Investment criteria & Budget Flexibility
	9	8	7	6	5	4	3	2	1	CRM Capability
	9	8	7	6	5	4	3	2	1	Customer feedback structure
	9	8	7	6	5	4	3	2	1	Technologies supporting data conversions
	9	8	7	6	5	4	3	2	1	Reporting Process
	9	8	7	6	5	4	3	2	1	Reporting Content
	9	8	7	6	5	4	3	2	1	Culture
	9	8	7	6	5	4	3	2	1	Skill set
	9	8	7	6	5	4	3	2	1	Education
	9	8	7	6	5	4	3	2	1	Creativity
Designing effective metrics	9	8	7	6	5	4	3	2	1	Process Documentation
	9	8	7	6	5	4	3	2	1	Team Involvement & KPIs
	9	8	7	6	5	4	3	2	1	Investment criteria & Budget Flexibility
	9	8	7	6	5	4	3	2	1	CRM Capability
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	9	8	7	6	5	4	3	2	1	Reporting Process
	9	8	7	6	5	4	3	2	1	Reporting Content
	9	8	7	6	5	4	3	2	1	Culture
	9	8	7	6	5	4	3	2	1	Skill set
	9	8	7	6	5	4	3	2	1	Education
	9	8	7	6	5	4	3	2	1	Creativity

Process Documentation	9	8	7	6	5	4	3	2	1	Team Involvement & KPIs
	9	8	7	6	5	4	3	2	1	Investment criteria & Budget Flexibility
	9	8	7	6	5	4	3	2	1	CRM Capability
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	9	8	7	6	5	4	3	2	1	Skill set
	9	8	7	6	5	4	3	2	1	Education
	9	8	7	6	5	4	3	2	1	Creativity
Team Involvement & KPIs	9	8	7	6	5	4	3	2	1	Investment criteria & Budget Flexibility
	9	8	7	6	5	4	3	2	1	CRM Capability
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	9	8	7	6	5	4	3	2	1	Reporting Content
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	9	8	7	6	5	4	3	2	1	Creativity
Investment criteria & Budget Flexibility	9	8	7	6	5	4	3	2	1	CRM Capability
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	9	8	7	6	5	4	3	2	1	Culture
	9	8	7	6	5	4	3	2	1	Skill set
	9	8	7	6	5	4	3	2	1	Education

	9	8	7	6	5	4	3	2	1	Creativity
CRM Capability	9	8	7	6	5	4	3	2	1	Customer feedback structure
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	9	8	7	6	5	4	3	2	1	Skill set
	9	8	7	6	5	4	3	2	1	Education
	9	8	7	6	5	4	3	2	1	Creativity
Customer feedback structure	9	8	7	6	5	4	3	2	1	Technologies supporting data conversions
	9	8	7	6	5	4	3	2	1	Reporting Process
	9	8	7	6	5	4	3	2	1	Reporting Content
	9	8	7	6	5	4	3	2	1	Culture
	9	8	7	6	5	4	3	2	1	Skill set
	9	8	7	6	5	4	3	2	1	Education
	9	8	7	6	5	4	3	2	1	Creativity
Technologies supporting data conversions	9	8	7	6	5	4	3	2	1	Reporting Process
	9	8	7	6	5	4	3	2	1	Reporting Content
	9	8	7	6	5	4	3	2	1	Culture
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	9	8	7	6	5	4	3	2	1	Creativity
Reporting Process	9	8	7	6	5	4	3	2	1	Reporting Content
	9	8	7	6	5	4	3	2	1	Culture
	9	8	7	6	5	4	3	2	1	Skill set
	9	8	7	6	5	4	3	2	1	Education
	9	8	7	6	5	4	3	2	1	Creativity
Reporting Content	9	8	7	6	5	4	3	2	1	Culture
	9	8	7	6	5	4	3	2	1	Skill set
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Culture	9	8	7	6	5	4	3	2	1	Skill set
	9	8	7	6	5	4	3	2	1	Education
	9	8	7	6	5	4	3	2	1	Creativity
Skill set	9	8	7	6	5	4	3	2	1	Education
	9	8	7	6	5	4	3	2	1	Creativity
Education	9	8	7	6	5	4	3	2	1	Creativity

2023

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OPTIMIZING PRODUCT-MARKET FIT: A DIGITAL MARKETING APPROACH FOR PERFORMANCE MEASUREMENT