TRENDY EKONOMIKY A MANAGEMENTU
TRENDS ECONOMICS AND MANAGEMENT
ISSN 1802-8527 (Print) / ISSN 2336-6508 (Online)

2021 38(2): 71–91
DOI: http://dx.doi.org/10.13164/trends.2021.38.71

Technology Start-up Marketing Strategy and Lifecycle: First Empirical Findings by Qualitative Research

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Abstract

Purpose of the article: Technology start-ups go through certain stages in their lifecycle. In each stage of the lifecycle, there is a different approach to marketing strategy and its application through marketing activities. Creating an empirically based framework of a technology start-up marketing strategy based on each lifecycle stage will increase the chances of success for such a technology start-up.

Methodology: This research is based on qualitative research using structured interviews with the Czech and Slovak technology start-ups. The questions were validated by pilot research with a selected technology start-up and modified accordingly. The sample was obtained using non-probability sampling methods. Deductive coding and content analysis are used. The outputs are represented by categorisation and followed by summarisation in the empirically based framework.

Scientific aim: The aim is to create an empirically based framework of the marketing strategy of a technology start-up based on the lifecycle stages. The empirically based framework will be developed as an initial effort to gain knowledge in this area and to develop questions or the research direction for the future.

Findings: The empirically based framework is developed through qualitative research to define the core marketing activities at a specific lifecycle stage. These activities are divided into categories of coding. The technology start-up should immediately and proactively develop marketing activities at the beginning of its foundation, not only internally but also with external support.

Conclusions: For boosting the success of a technology start-up, it is necessary to create customised marketing activities. The ambiguous definition of a start-up hinders the advancement of the body of knowledge in this area and therefore primary research methods must be developed. The research is limited by the broad scope of the given topic. The marketing strategy area as such cannot be entirely covered and therefore sub-points need to be further addressed.

Keywords: start-up, technology start-up, start-up development, start-up lifecycle, marketing strategy, marketing mix

JEL Classification: M13, O32

Introduction

The start-up environment is becoming the engine of the global economy, where the largest innovation centres are in the sights of foreign investors who want to be among the winners in the race to get the most value for their investment and bet on the "right" start-up. The winners among start-ups are constantly mentioned in various media and are considered as an example of a successful modern form of entrepreneurship in an innovative world. However, not everyone can be a winner in the market and these media do rarely mention the masses of failed start-ups that end up in oblivion in spite of a good start. The question arises in terms what actually is or is not considered a start-up and what are its lifecycle stages. To understand the context of the various fields of scientific research in entrepreneurship, management or marketing, the trend is to divide the whole issue into subparts that are subjected to further research. We often encounter a particular phenomenon from the area of management and business into several phases. Therefore, practitioners and researchers in economics and management have been focusing on the lifecycle of a product, firm or industry for several decades. If we take a closer look at a technology start-up as one of the possible forms of entrepreneurship that is not considered a firm in the "traditional sense", it is appropriate to divide this theoretically conceived whole into subparts for the same purpose as in the case of a product, a "traditional firm" or an industry. The possible categorisation options of the technology start-up lifecycle have been the focus of the authors of this paper. They aimed to develop a comprehensive theoretical framework. This theoretical framework of the technology start-up lifecycle helped the authors to understand the different stages from multiple perspectives and facilitated the theoretical identification of the approximate position of a technology start-up and a lifecycle stage with certain comprehensive characteristic.

The success of technology start-ups depends on many factors. Yet, one of the dominant problem areas features low sales based on an ineffective marketing strategy. Moving through the stages of its lifecycle, a technology start-up must respond to opportunities and threats emanating from the external environment and change its approach to a marketing strategy. This marketing strategy can therefore be identified as a key success factor in an international market where often a good product or service will not find its customer. Research in start-ups is insufficient; there is a lack of greater activity of the professional sphere in proportion to the significant importance and activity of start-ups on the global market and their constant media coverage. In particular, the area of the start-up lifecycle and marketing strategy is not explored. To increase the capability not only of Czech technology start-ups, but also technology start-ups in general, it is necessary to address this topic and give it importance in the future. A technology start-up goes through certain milestones since its inception where a different approach to marketing strategy may be more effective, or has to adopt changes in sub-tactical and operational processes, pursue different KPIs or use different marketing tools. Creating an empirically based framework of marketing strategy for technology start-ups depending on their lifecycle may not immediately achieve the desired effect and provide an effective approach on how a technology start-up should create a marketing strategy at a particular stage of the lifecycle. The purpose, however, is to stimulate further research by the authors of this paper or by other professionals.

The qualitative form of marketing strategy research is recommended by several authors, such as Morgan *et al.* (2019), who state that due to the smaller number of accepted qualitative papers and primary research, the very motivation to produce such research is rather reduced. Important trends in marketing strategy in different areas will not be sufficiently understood and their full potential may not be implemented in practice. Technology start-ups operate in a specific market environment where the concept of management functions may be perceived differently compared to a theory or firms without a start-up label. In general, a marketing strategy may be perceived differently by start-up founders compared to a theory, and therefore it is necessary to examine technology start-ups and their marketing strategy in practice.

The aim of this research is to create an empirically based framework for the marketing strategy of a technology start-up based on the lifecycle stages. The empirically based framework will be developed as an initial effort to gain knowledge in this area and to develop questions or the research direction for the future. From the literature reviewed and the purpose of the paper, the researchers developed the following research questions. These research questions were used to further define the research area and the focus of the structured interviews:

- RQ1: What is the characteristic of the concept of a marketing strategy from the perspective of founders of a technology start-up?

For RQ1, the concept of a marketing strategy is observed from the perspective of technology start-ups in practice, *i.e.* a large number of founders are not primarily focused only on the economic or marketing aspects of the start-up but these are seen as carriers of the technological idea (Ulč, Mandel, 2021). The way these founders perceive the marketing strategy from a general perspective represents an important aspect that should be part of this research.

- RQ2a: What are the main drivers of a marketing strategy for technology start-ups at the Pre-seed/Idea, Seed/Launch, Growing/Scaling, Maturity, and Exit/IPO/Acquisition stages?
- RQ2b: What are the marketing strategy activities through the marketing mix for technology start-ups at the Pre-seed/Idea, Seed/Launch, Growing/Scaling, Maturity, and Exit/IPO/Acquisition stages?

RQ2a and RQ2b are developed in order to gain data at a given stage of a technology start-up and are the primary research objectives of this study. In the future, it is thus necessary to survey technology start-ups that have a huge potential. Marketing activities that support the success of start-ups should be carried out with respect to lifecycle stages, according to Nikiforova (2018).

1. Theoretical background

With a specific research focus, it is necessary to define some key areas. As the title of the paper suggests, the theoretical background is focused on a marketing strategy, technology start-up and the lifecycle stages of a technology start-up. The technology start-up per se and lifecycle stages will be defined with reference to already established research in this area.

1.1 Marketing strategy

While researching technology start-ups and their marketing strategy, it is necessary to state the definition and understanding of a marketing strategy. Approaches to a marketing strategy are constantly evolving depending on changes in the level of digital technology, where a steady increase in the use of digital marketing tools can be observed. In general, a marketing strategy can be perceived from several perspectives, often differing in business literature, academic literature and according to the concepts of authors and practitioners from different backgrounds. One of the most frequently used definitions of a marketing strategy is the definition of the American Marketing Association, publisher of academic journals, such as *Journal of Marketing, Journal of Public Policy & Marketing, Journal of Marketing Research, Journal of International Marketing*: *"Marketing is the activity, set of institutions, and processes for creating, communicating, delivering, and exchanging offerings that have value for customers, clients, partners, and society at large."* A more comprehensive approach of the research-based marketing strategy definition in this area is defined by Varadarajan (2010, p. 130): *"Marketing strategy refers to an organization's integrated pattern of decisions that specify its crucial choices concerning marketing activities to perform and the manner of performance of these activities, and the allocation of marketing resources among markets, market segments and marketing activities toward the creation, communication and/or delivery of a product that offers value to customers in exchanges with the organization and thereby enables the organization to achieve specific objectives."*

This topic has been addressed by a considerable number of authors. However, in their approach it is more of a tactical concept of individual factors and tools. The difference is visible in the concept of marketing strategy and marketing tactics. Some sources refer to the 4Ps (5Ps, 7Ps, 8Ps) marketing mix approach as marketing strategy and others as marketing tactics. Other sources mention the marketing strategy in the context of the segmentation, targeting and positioning process and, on the other hand, the marketing mix as a marketing tactic (Varadarajan, 2010). Webster (1992) states that it depends whether we are at the corporate, business or SBU level. Marketing as a strategy is understood at the SBU level with its focus on segmentation, targeting, positioning and defines how to be competitive in the market. This concept is further developed at the operational level within the marketing tactics through the elements of the 4Ps (5Ps, 7Ps, 8Ps) marketing mix. In general, within the marketing strategy, we define to whom we sell and how we apply this strategy at the operational level within the marketing tactics, through the marketing mix and elements such as promotion, place or price (Crawford, Di Benedetto, 2008).

If we view the marketing strategy not only as a process of segmentation, targeting and positioning, but also as the marketing mix per se, we may perceive the issue from a strategic level perspective, where some decisions can be more or less strategic (Varadarajan, 2010; Mintzberg, 1987). However, what is lacking in the above approaches is a greater customer orientation and added value. An extended value approach was previously reported in their study by Slater, Olson (2001), with reference to Corey (1991), Cravens (1999), Day (1990), Hunt, Morgan (1995), Kotler (1994), and Varadarajan, Clark (1994) defining a marketing strategy as a set of integrated decisions and activities that achieve its marketing objectives and satisfy customer requirements. These requirements are created by specific capabilities in a particular segment using elements of the marketing mix.

Technology start-ups have a high tendency to operate immediately in the global market from the moment of their product launch. İpek (2021) present a conceptualisation of the international marketing strategy divided into 7 categories, *i.e.* the product strategy, distribution strategy, promotion strategy, price strategy, market expansion strategy, marketing involvement and intelligence, and general international marketing strategy. The trend of the digital marketing strategy is intrinsically linked to the marketing strategy of technology start-ups. The rise of information, communication and transportation technologies, as well as a rapid increase in the use of the Internet and social media, enabled companies to reach segments beyond their national borders more effectively. SMEs, which also include technology start-ups, frequently operate with limited resources and are motivated to face challenges in the international marketplace flexibly, efficiently and quickly use new digital technologies (Glavas, Mathews, 2014; Javalgi *et al.*, 2012; Moen *et al.*, 2003). In the marketing strategy context, from a marketing mix perspective, we provide a brief description of the changes and benefits for the international firm. The product is adapted to the individual customer's requirement through personalisation and customisation (Sheth, Sharma, 2005). In the past, companies chose whether to standardise or customise their product, but owing to the boom in digital technologies, they can combine both approaches, where standardisation is manifested by economies of scale, for example, and customisation, on the other hand, is manifested by satisfying unique customer requirements. In this manner, firms can create a sustainable competitive advantage in the international market. The trend is to use co-creating or crowdsourcing, where customers' ideas for new products or improvements to existing ones are used (Katsikeas *et al.*, 2020). In terms of promotion, digitisation enables the firm to reach a large number of customers at a lower cost through online marketing communication using social media, emailing, PPC, SEO and more (Johnston *et al.*, 2018). Owing to modern technology, firms can sell their products exclusively through distribution channels via the Internet or at least have this channel as an alternative or complement to their traditional distribution channels. In the logistics process, it is possible to accurately track the order status by both the customer and the firm from the receipt of order until actual delivery. This reduces the likelihood of errors, delivery delays or customer dissatisfaction (Katsikeas *et al.*, 2020). Digitalisation has facilitated developing and implementation of an international marketing strategy, where the use of digital tools allows firms to better coordinate its marketing activities abroad, achieve cost efficiencies, reach small niche segments, increases brand equity and most importantly enables them to report higher profits and sales volume (Katsikeas *et al.*, 2020). Despite the changing external environment, due to the increase in technological advancement and digitalisation, there is a lack of relevant expert resources on the impact of digitalisation on international marketing strategy that remain behind the practice (Leonidou *et al.*, 2018).

In their assessment of the current state of scholarship in strategic marketing and marketing strategy, Morgan *et al.* (2019), state that for theory-based marketing strategy studies published, we find few relevant sources that focus on theory building and a greater number of sources that test the theories. These theories used in marketing strategy need to be tested to determine their applicability not only in academia but also in practice. We rarely find the use of qualitative approaches with these sources because it is difficult to empirically investigate approaches to marketing strategy without first understanding its nature in the specific case. In the marketing world, new marketing phenomena are emerging in practice and theoretical research on marketing strategy lags behind these trends. For better understanding of these trends, it is advisable to make an effort to do in-depth qualitative research instead of quantitative methods, such as questionnaire surveys, and to examine the context of many of the occurring phenomena. Despite interesting questions constantly being asked by marketing researchers, the latter do not exert more activity to answer these questions and keep pace with methodology and practice (Houston, 2016).

In the concept of Morgan *et al.* (2019), we can observe a marketing strategy review framework that captures the grounds of the marketing strategy identifying essential factors (Figure 1). The marketing strategy formulation can be defined as a set of decisions about the objectives to be achieved, the selection of the target market to be addressed

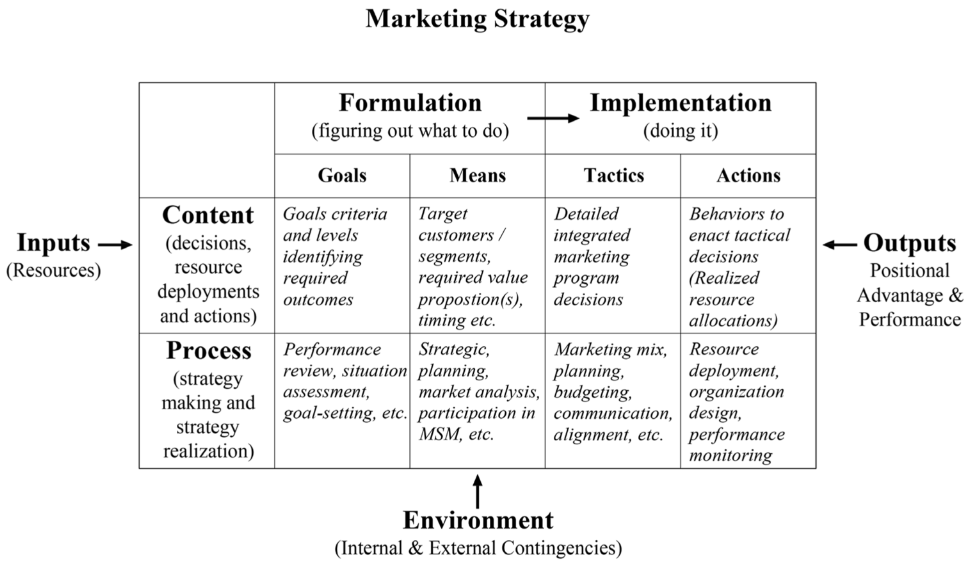

Figure 1. Marketing strategy review framework. Source: Retrieved from Morgan et al., 2019.

and the perceived high added value for the customer. Implementation translates these decisions into a set of specific actions implemented through the marketing mix, with corresponding resources and actions within the marketing tactics.

1.2 Technology Start-up

A start-up is a difficult concept to define and its more precise definition might be rather challenging. A large number of stakeholders in the start-up business have different opinions. What is often cited are 3 main characteristics, *i.e.* new, active and independent. Yet, based on the above definition, any new independent business in the first stage of its lifecycle can be described as a start-up (Luger, Koo, 2005; Salamzadeh, Kawamorita Kesim, 2015). This approach is not sufficient in this research and more specific details in this area are required. The general public can perceive, also owing to the influence of media, some characteristic features of a start-up, identical in content to those found in a large part of scientific sources. These involve innovative ideas, potential for rapid growth in a short period of time, creativity, flexibility, agility, a low level of bureaucracy, and others. Start-ups are often located in a dynamic market, with a high level of instability and uncertainty, are sought after by potential investors with a prediction of future value, have scalability potential, limited resources and play an important role for the founder(s) (Coleman, O'Connor, 2008; Crowne, 2002; Kirchberger *et al.*, 2020; Laage-Hellman *et al.*, 2018; Nikiforova, 2018; Paternoster *et al.*, 2014; Wouters *et al.*, 2018). The issue of start-ups is frequently mentioned in commercial business literature. We would like to mention that the book The Lean Startup and its implementation of lean principles in start-ups (Ries, 2011) has the greatest impact on practice.

In terms of the possible categorisation of start-ups, we do not encounter a uniform division. If we were looking for a precise categorisation of start-ups and a directly defined type of technology start-up, we would search in vain. A large number of business sources refer to the categorisation according to Blank (2011), defining 6 types of a start-up, such as lifestyle business, small business, scalable start-up, buyable start-up, large company,

Table 1. One of the potential categorisation of start-ups.

IT/Software development	SaaS	Bio/Nano and medical technology
Industrial technology/production/hardware	Consulting company/Agency	FinTech
Online marketplace	Media and creative industries	Green technology
Consumer mobile/web application	Education	E-commerce
Food	Games	Online service portal
Stationary wholesale and retail	Other	

Source: Statista, 2018.

and social entrepreneur. However, this categorisation does not define clearly the start-up focus and the reason for the start-up foundation. Not all the types of the abovementioned start-ups are scalable or aimed at technological innovation. The categorisation of start--ups is most frequently used in the data of organisations focused on producing statistical reports in the start-up sector. The start-ups are then often divided by sector and industry. For example, Statista Inc. (2018) states in its report focused on distribution of start-ups according to the industry sector in Europe more than 15 start-ups in their categorisation (Table 1). Other organisations, such as Startup Genome LLC or Keiretsu Forum CEE in the Czech environment, provide reports dedicated to the start-up sector and also use a different categorisation. Moreover, it largely depends on the source from which these organisations draw their data.

It is difficult to find an individual type of a start-up that is directly defined as a technology start-up. We come across several approaches mentioning start-ups focused on technological innovation. These start-ups are referred to variously as a software start--up (Paternoster *et al.*, 2014; Sutton, 2000), high-tech start-up, new technology-based firm (Bertoni *et al.*, 2011; Colombo *et al.*, 2010) and lean global start-up (Stavnsager Rasmussen, Tanev, 2015; Tanev *et al.*, 2015). The term technology start-up is directly stated by Kirchberger *et al.* a (2020) Wouters *et al.* (2018). A technology start-up is defined as a new firm based on a new technology or an innovative use and approach of one or more already available technologies. These start-ups focused on innovative technologies have huge potential. Yet, there is a lot of pressure from potential investors, the markets are highly volatile and often unknown (Kirchberger *et al.*, 2020; Paternoster *et al.*, 2014; Sutton, 2000). Combining the available sources, Ulč (2021b) defined a possible approach to define a technology start-up:

"A technology start-up is a fledgling independent firm, founded by people sharing the same passion, with a highly innovative technology business idea, operating under conditions of great uncertainty, looking for a scalable and iterative business model, with predominantly global ambitions, with the potential for meteoric growth in the short term, often sought out by potential investors with a view to future value, creative, flexible without a high level of bureaucracy, with an agile organisational structure, often operating in a new or unknown market and with limited resources. The criterion is that a technology start-up describes itself as a technology start-up and is perceived as such by its environment." This definition was developed in previous research by Ulč (2021b) to make it easier to identify and tag technology start--ups in later research in this area. An entrepreneurial entity that meets the given characteristic and describes itself as a technology start-up is thus part of this research.

1.3 Technology start-up lifecycle

The technology start-up lifecycle of is often focused by different authors on a specific area, without a higher level of complexity.

The authors report a different number of stages, *e.g.* Salamzadeh, Kawamorita Kesim (2015) states 3 stages, Bocken (2015), Crowne (2002) a Santisteban, Mauricio (2017) lists four possible lifecycle stages, Tripathi *et al.* (2019) defines five stages and Wang *et al.* (2016) six stages. However, not every approach is considered to be comprehensive, and for determining a stage of a start-up, it was necessary to explore this area in previous research and develop a more comprehensive theoretical framework. According to Ulč (2021a), Lifecycle of Technology Start-Ups and Characteristics of Individual Stages: New Theoretical Framework, the technology start-up lifecycle is divided into five stages, involving characteristics in terms of financing, product, type of customer, risk, level of business plan/model, and others. These stages include the Pre-seed/Idea stage, Seed/Launch stage, Growing/Scaling stage, Maturity stage, and Exit/IPO/Acquisition stage. This framework was developed by review of secondary professional sources, as well as business literature. Based on the research of secondary sources, a theoretical framework of the particular stages of the technology start-up lifecycle was developed by evaluating, comparing, and critically assessing different sources and theories. Particular emphasis was placed on monitoring the correlated information provided in the

Table 2. Technology start-up lifecycle and characteristics of the stages.

Objective	**Pre-seed Idea**	**Seed Launch**	**Growing Scaling**	**Maturity**	**Exit, IPO, Acquisition**
Funding	Bootstrapping, FaF, own resources, incubators	Angel investment, accelerators, crowdfunding	Venture capital, accelerators	Late VCs, Private Equity firms, Banks, Hedge	IPO, Acquisition
Product	Preparing MVP	Validate MVP	Continuous improvement of product	Stable high-quality product	Depends on the situation of exit
Type of Customer	Innovators	Innovators Early-adopters	Early-majority	Early-majority Late-majority	Late-majority Laggards
Customer Development	Customer Discovery	Customer Discovery / Validation	Customer Creation	Company-building	Depends on the exit situation
Risk	External threats and false idea risk	External threats, Investor entry risk, product validation risk, and human factor risk	External threats, investor entry risk, customer expectations risk, innovative advantage risk, and human factor risk	External threats	External threats
Business plan / model	Preparing business plan	Preparing business model and iterated it	Working business model	Repeatable business model	Working high-level business model
Focus on	Problem / solution fit	Customer / market	Increase market share, revenues	Retaining customers and preparing for exit	Evaluation of a start-up
Notables	Idea and development	Pivot, lean principles, valley of death	Exponential growth, scaling, stagnation	Expansion	Depends on the exit situation
Founders / Employees	1–5 founders, Innovative idea creators	Development, marketing, and sales	Back office, administration		

Source: Ulč, Mandel, 2021.

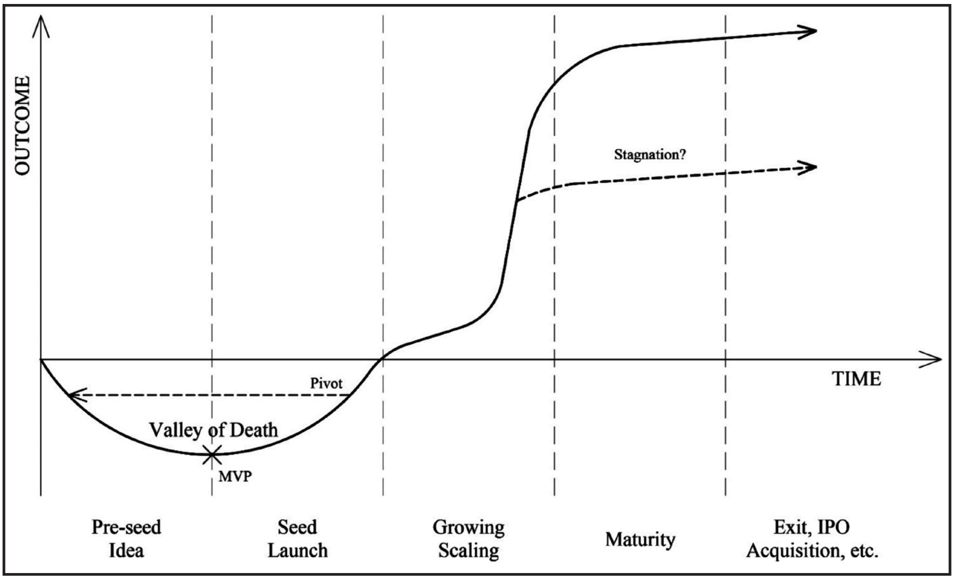

Figure 2. Technology start-up lifecycle. Source: Ulč, Mandel, 2021.

individual sources and their possible application to the newly proposed theoretical framework of the technology start-up lifecycle.

Due to the theoretical nature of the framework, it was necessary to further validate the characteristics of each stage. This approach was validated by Ulč, Mandel (2021) through primary qualitative research in the form of semi-structured interviews with six technology start-ups. These technology start-ups were in area of software development, AI and machine learning technologies, high-tech scientific devices, SAAS and SASE. In the research, deductive coding and content analysis were used, represented by the categorisation and summarisation of the results. These results were then compared with the theoretical framework developed by Ulč (2021a). Based on the results, the theoretical framework of the technology start-up lifecycle, the characteristics of the stages and the graphical representation were updated. Much of the characteristics of the Pre-seed/Idea, Seed/Launch, Growing/Scaling stages have been confirmed during the research. The output is a first round of the tested theoretical lifecycle framework with some comprehensive characteristics (Table 2). It also includes a graphical representation that has been very well received by several examined start-ups (Figure 2).

In the first two phases, a technology start-up has high costs for product development and subsequent product launch. Funding often relies on own resources in these stages. Therefore, in the graphical representation, we can see the output of a technology start-up, which is theoretically below the horizontal axis in the first two stages due to the significant consumption of financial resources. A technology start-up may fail at any stage of its lifecycle. The first two stages are the most critical in general and we can describe them as the “valley of death”. In the following stages output increases. If the technology start-up manages scaling successfully, this increase is very fast. The successful end of the technology start-up offers several options. From an investment perspective, an IPO has generally been considered the best outcome for VCs investors according to Bertoni *et al.* (2011).

2. Methodology

The goal is to create an empirically based framework of marketing activities based on deductive general knowledge in the area of the marketing strategy of technology start-up lifecycle stages. The desired objectives will be achieved through qualitative research based on structured interviews with eight Czech and Slovak technology start-ups operating in the global market. The included technology start-ups were obtained using non-probability sampling methods in a combination of convenience sampling and purposive sampling. Primarily, convenience sampling was used for technology start-ups that had a strong presumption of access to interview creation and also match the description of a technology start-up. Next, the selected sample was subjected to purposive sampling, where the goal of the potential sample of technology start-ups was to include multiple different specific technologies and different lifecycle stages. The selected sample includes one or more technology start-ups at each stage, where not only the current stage is relevant, but also the stages the start-up has already passed through. The included technology start-ups do not want to be mentioned directly, only the area of business. The life stage was specified after the interview itself, where the technology start-up mentions the most important milestones during its existence on the market, gives relevant information about the rounds of funding that have already been raised, the product level and generally reviews their current situation from their perspective. Based on this data, the current stage of a technology start-up can be indicated by a comparative analysis with the already developed lifecycle framework (Table 3).

Structured questions are developed by theoretical insights of the marketing strategy, technology start-up, technology start-up lifecycle, and outputs according to Ulč (2021a) and Ulč, Mandel (2021). The questions focus on the individual elements of the marketing mix, marketing activities, the process of segmentation, targeting, external support and their changes during the existence of a technology start-up. The first set of questions focuses on the start of a technology start-up, before the actual sale of its product. The information provided in the introduction of the technology start-up, the mention of important milestones and the description of the current situation create several time periods perceived by the technology start-ups themselves. In the next stages, the questions are formulated in a very similar manner, yet with a strong focus on differences in the comparison to the previous stages. The set of questions can be called an interview guide as a structured interview tool (Miles *et al.*, 2020). The advantages of a structured interview are time efficiency, reduced subjectivity and bias, and control the interview

Table 3. Technology start-ups in qualitative research.

Technology start-up	Area of business	Current stage
I.	Software development	Maturity
II.	Cyber security	Exit / IPO / Acquisition
III.	SASE	Seed / Launch
IV.	Automation	Maturity
V.	Cyber security	Seed / Launch
VI.	High-tech hardware	Growing / Scaling
VII.	SAAS	Growing / Scaling
VIII.	AI Development	Seed / Launch

Source: Own elaboration, 2021.

process. These benefits simplify the process of coding, comparison and data analysis (Holloway, Galvin, 2017). A deductive coding approach is used, where a pre-defined list of codes is created in a so-called coding frame before starting to code data (Miles *et al.*, 2020). These codes are based on the existing theoretical background outlined in the previous theoretical background. The pre-defined codes can be referred to as the first round of coding and are descriptive in nature. In the process of coding, the coding framework was extended with new interesting facts that were not captured by the pre-defined codes (Linneberg, Korsgaard, 2019). After qualitative interviews were generated, codes were expanded and then categorised. This process can be referred to as the second round of coding. The categories of deductive coding are divided into the perceived marketing strategy, product, price, promotion, distribution, segmentation, external support, and notables. These categories are the same for each stage of the technology start-up lifecycle (Table 4). During the second round of coding, analytic memos are used, which according to Linneberg, Korsgaard (2019) help materialise ongoing reflections, inform subsequent data collection and lead to richer explanations in the analysis later on. The coding was done manually, without the use of special software. The data are interpreted with the help of content analysis. The outputs of the content analysis are represented by the categorisation and followed by the summarisation in an empirically based framework. This research contributes to theory-building, identifying and elaborating new concepts focused on the marketing strategy of technology start-ups, outlining the different aspects of a phenomenon and their description in different stages of the lifecycle.

The developed qualitative interviews were transcribed. The interviews were generated over the period of September-November 2021, where the length of the interview depended on the current stage of the start-up lifecycle. On average, the interviews took 40 minutes and were created in collaboration with at least one of the founders serving as the CEO and also frequently the person in charge of marketing or business operations. If the interviewed technology start-up went through all stages of the lifecycle, it answered 45 questions. The structured interview questions were validated by pilot research with a selected technology start-up and modified accordingly. The emphasis in the interviews was placed on identifying the most successful and important decisions in a

Table 4. Categories of deductive coding in qualitative research.

Stage	**Pre-seed Idea**	**Seed Launch**	**Growing Scaling**	**Maturity**	**Exit, IPO, Acquisition**
	Definition	Definition	Definition	Definition	Definition
	Perceived marketing strategy	Perceived marketing strategy	Perceived marketing strategy	Perceived marketing strategy	Perceived marketing strategy
	Product	Product	Product	Product	Product
	Price	Price	Price	Price	Price
Categories	Promotion	Promotion	Promotion	Promotion	Promotion
	Distribution	Distribution	Distribution	Distribution	Distribution
	Segmentation	Segmentation	Segmentation	Segmentation	Segmentation
	External support	External support	External support	External support	External support
	Notables	Notables	Notables	Notables	Notables

Source: Own elaboration, 2021.

specific lifecycle stage and marketing strategy. A large part of the surveyed technology start-ups did not go through all the lifecycle stages, and therefore, it is logical that we obtained the largest amount of available data on the first stages and the least data on the last stages. The information gathered is extremely valuable.

3. Results

The qualitative research findings are divided into subchapters according to the lifecycle stages and categories of coding. The outputs are represented as a summarisation in an empirically based framework.

3.1 Marketing strategy by founders of technology start-ups

Definition: The opinions of the examined technology start-ups differ significantly. Concepts such as communication, marketing channels, investment, web, social networks, sales, targets, customers, competitors, marketing tools, PR, added value, market, and others are involved. A marketing strategy is perceived by technology start-ups as a tool by which the start-up acquires customers who perceive high added value in the start-up's output and are willing to pay a price for this output. The primary area is therefore customer acquisition and the generation of PR that will indirectly influence sales volume. The marketing strategy should be oriented towards objectives and sub-objectives in the short term with a specific budget for the specific period. The idea of one of the technology start-ups under study, which perceives everything the start-up creates as a marketing strategy, while getting in touch with the customer, seems to be very interesting.

3.2 Pre-seed / idea stage and marketing strategy

Perceived marketing strategy: When a start-up is launched and a product is developed, the start-up functions are very limited and no actual sales take place. Technology start-ups indicate that it is not possible to talk directly about a specific marketing strategy in the first stage. It also often depends on previous experience, *i.e.* the first-time founder is more focused on the idea and technological innovation than on the creation of potential marketing activities. While technology start-ups have taken some steps, such as directly reaching out to potential partners and prospects, creating social media profiles on Facebook, LinkedIn, Twitter, websites, *etc.*, they do not consider this process to be a marketing strategy at the outset. According to them, only one of the start-ups under research created a marketing strategy. However, this situation was conditioned by a co-founder who was directly an expert in marketing.

Segmentation and targeting: In this stage, technology start-ups already assume that they are able to identify their target market segment to offer their product. Yet, the actual product development and technology solution comes from the internal customer need to solve a particular problem. Thus, there is a market segment that aims to solve this problem and the technology start-up responds to the need from the external market environment. Often, potential segments are already looking for a solution to their problem in the market and approach technology start-ups. In this stage, technology start-ups are aware of the potential segment they will target. They also consider how to reach these segments. However, there is only a rough prediction of the future marketing channels used.

Product: The product is developed on the basis of a technological innovation based on the idea of one or more founders. The product is not commercialised at this stage and most important is product development.

Price: The formulation of the preliminary price depends on the particular problem that the technology start-up solves with its product. We often encounter the situation that there is no competitor in the market and the price is created intuitively along with preliminary costs and sufficient margin or according to communication with the prospect and testing how much this prospect would be willing to spend on the specific product. Frequently, the preliminary price is set lower in order to get feedback from prospects. Nevertheless, this step is retrospectively seen as inefficient by some start-ups since it is always easier to lower the price during the sale than to raise it.

Distribution: Distribution channels cannot be directly discussed in this stage due to the preparation of the MVP, without sales. Efforts should be made to reach out to prospects with whom the technology start-up wishes to collaborate in the future to sell the product. It is also important to start creating potential online communication channels. Some B2B technology start-ups have started to establish a partner program as a main distribution channel right from their inception.

Promotion: In the first stage, it is recommended to create a website, profiles on appropriate social networks, *etc.* On the other hand, if there are events related to the technology at least remotely, the use of events such as conferences, special fairs, competitions, *etc.* has a great impact on the future success of such a start-up.

External support: The use of external support such as a marketing agency is not identified in this stage. Technology start-ups are primarily concerned with the product, its technological identity and added value for the customer, without much focus on other areas such as marketing, sales and HR. At most, there might be mentoring provided organisations, such as JIC, CzechInvest and others.

Notables: It is of utmost importance to develop the product and identify the potential customer to be approached. The emphasis is not put on creating comprehensive strategies, but on testing a few core hypotheses for the product. In retrospect, a large number of start-ups would have paid more attention to marketing activities to develop PR from the start-up's inception to creating brand awareness to future customers. Success stories include the aforementioned events that subsequently generated leads, as well as the emphasis on direct marketing, emailing, prototyping and MVP generation and acquiring first partners.

3.3 Seed / Launch stage and marketing strategy

Perceived marketing strategy: In this stage, the question is whether we can define the company's marketing activities as a marketing strategy. Rather, this process can be described as the development of a marketing strategy.

Segmentation and targeting: In the second stage, technology start-ups addressed segments they had already identified. However, immediately at the beginning, there might be a situation that this segment does not show a high potential for the future and during this stage, the technology start-up targets another market segment. The B2G segment prediction may serve as an example, *i.e.* the MVP validation detected that this segment may not have the potential for future exponential growth, which is more likely to be achieved in the B2B market and make a pivot.

Product: The offered product can be described as a prototype or MVP that begins to be tested at the time of sale. The metrics tracked at first sale are primarily simplified to the number of products sold, revenue, number of customers, customer satisfaction, and expenses. Due to the smaller sales volume, there is often not enough data to use more comprehensive indicators such as lifetime value.

Price: The product price frequently changes compared to the predictions in the first stage. After the product launch, low-priced technology start-ups have increased the price within one to two years. Due to threats from the external environment, there is high price volatility of some materials and components, and thus some hardware-based start-ups have difficulty determining the final price of their product due to the potential for higher costs.

Distribution: The distribution channel is operated through various partner distributors who further market the product and establish long-term contacts. An effective solution is to create partnership programmes that are attractive to potential distributors, except for the software-oriented products where the distribution channel is, for example, the application itself.

Promotion: The communication strategy is then developed in the form of events, conferences, direct marketing, emailing from the previous stage. In this stage, more emphasis is placed on online communication channels and the use of paid online advertising. An important point consists in the decision whether to internally secure the company's marketing activities, *e.g.* through a new job position, or to use external specialised agencies. Some start-ups retrospectively reflect that they should have built online marketing with the help of an external agency right from the start of sales. This stage involves the creation of the first online marketing campaigns and the website innovation or upgrade. Often, however technology start-ups in the B2B market do not take advantage of PPC campaigns, SEO optimisation or creation of interesting content. In this stage, some technology start-ups tried to use PPC campaigns, SEO optimisation and other marketing tools. If they did not see the desired effect, they decided not to use these channels any more. An interesting fact is that according to the technology start-ups, there is an opportunity to use comparison engines which can bring in more customers at lower cost and higher customer impact. The metrics tracked are increasingly generic in nature, such as revenue, number of customers, cost per conversion for PPC, cost per click, the number of impressions, and more.

External support: External assistance is still only in the form of mentoring from organisations such as JIC or CzechInvest, or from the investor. The marketing activities of the start-ups under research are handled by internal resources, which in retrospect may be seen as ineffective. Partly, there is also support with marketing activities through an acquired investor who either has the required know-how, a good marketing team in another company, or directly owns a marketing agency. Technology start-ups evaluate any external help positively.

Notables: The main objective of this stage is to get the first revenue based on the first leads, explore a possible future business model and to aim for the break-even point. They need to develop marketing channels, such as social media and websites, and prepare them for content creation as soon as possible. The start-ups attend events and conferences as much as possible and work on developing relationships with business partners. One of the most important points in this stages is to obtain and create marketing activities through in-house provision of marketer/marketers or use services of external agencies. Thus, it can be concluded that a technology start-up should step out of its technological role and become more market-oriented. There should be an emphasis on planning marketing activities for the future and creating quality content immediately. Getting a few good references is crucial for some technology start-ups. They achieve this by constantly tailoring their product to the customer and actively communicating with the customer, which we can call direct marketing.

3.4 Growing / scaling stage and marketing strategy

Perceived marketing strategy: In the third stage, we can affirm that this is a marketing strategy. Technology start-ups are fully aware of the fact that in this stage, creating marketing activities is crucial for future success.

Segmentation and targeting: In this stage, technology start-ups reach out to other market segments that they have discovered owing to the feedback on their product. What is also typical is expanding orientation to other segments, *e.g.* from the B2B to the B2C market.

Product: As a result of the needs of potential customers in the market, the product portfolio is often expanded in this stage to include additional products based on the same technology but with some specific features adapted to the new segments.

Price: In terms of pricing, some technology start-ups are changing their approach to pricing. This includes, for example, changing from a pay-per-product to a subscription model. It also includes, for example, one-off price increases to generate more revenue per unit of sales, ensure sufficient service for these customers and higher potential scalability.

Distribution: Technology start-ups still use the same distribution channels. There is still an emphasis put on the affiliate programme, which is considered the core distribution channel for some start-ups.

Promotion: Marketing activities are often generated by internal resources, usually involving a marketing team in this stage, supported by an external marketing agency. To reach the global market, it is essential to have a high level of the website, social media, brand awareness and PR building through engaging content. The costs associated with promotion increase radically in this stage. Technology start-ups already perceive their market position and grow in the short term. They are on the radar of potential large investors and creating marketing activities is not only for the purpose of their own sales but also for PR towards these investors. We can say that this stage is partly a preparation of their marketing activities for the future appreciation of the founders *e.g.* in the form of an acquisition or IPO. In this stage, there is a lot of pressure to monitor the results of marketing campaigns, for which it is important to devote time to reporting and evaluation.

External support: Marketing activities are addressed both internally and externally, often with the support of analyst firms such as Gartner Inc. and by an external marketing agency. Content creation is efficient with the support of a professional copywriter who is outsourced.

Notables: The main objective of this stage is to develop a marketing strategy focused on scalability. In this case, the main effort is to increase sales without an additional unit of input, retain existing customers, create effective promotion and grow brand value. The key objective in this stage consists in knowing the target market and creating activities towards it. At this stage, the technology start-up has a stronger market position.

3.5 Maturity Stage, Exit/IPO/Acquisition stage and marketing strategy

The examined technology start-ups are currently mostly in the second and third stages, so the data obtained for the last two stages is more limited. The maturity stage is regarded as a preparatory stage for the actual sale of the start-up. There are no radical changes in key market segments, no radical development of the product portfolio and no visible change in price and distribution channel. Marketing activities are designed to maintain a good market position. The technology start-ups under research report retrospectively that the increase in costs for marketing activities aimed at maintaining a good market position. On the other hand, however, they have found that they significantly influence investor interest in technology start-ups. In such a case, it is advisable to use the external cooperation of marketing agencies and analytical companies, which, owing to a successful marketing campaign, can ensure a profit for the investors who see a great potential for future appreciation of their investment.

4. Discussions

The data obtained largely relates to the first two stages, as all the technology start-ups under research have passed the first stage and are at least passing through the second stage. On the other hand, there is little data obtained on the last two stages, where future research needs to be extended to other technology start-ups. Technology start-ups and their opinion on the concept of marketing strategy are different. However, an identical basis can be found here, *i.e.* marketing strategy is referred to as a process in which, based on various steps, the gain of a customer who perceives a high added value of the product and is willing to pay is regarded as the greatest achievement. Technology start-ups often mention individual elements that fall under marketing strategy such as PR, communication, competition, digital marketing, marketing tools, and more. We can therefore mark RQ1 as answered.

A more complex challenge comprises the content analysis of data of the technology start-up lifecycle. The output is an empirically based framework of marketing strategy for technology start-ups that answers RQ2a and RQ2b (Table 5). The outputs of the content analysis are represented by categorisation and summarisation. In terms of evaluation, the focus is on the most valuable information obtained at a specific stage.

When researching technology start-ups, the first important finding focuses on the marketing strategy which is partly discussed internally after the product launch, preceded by testing the product in cooperation with

Table 5. Empirically based framework of marketing strategy of technology start-ups.

Category	Pre-seed idea	Seed launch	Growing scaling	Maturity a exit/IPO/ acquisition
Perceived marketing strategy	Marketing activities	It is partly considered a marketing strategy	Marketing strategy	Marketing strategy
Segmentation and targeting	Segment with a problem to be addressed	Option to change the segment	Expanding its targeting to other specific markets	Maintaining current segments
Product	Prototype and hypothesis validation	MVP testing	Product portfolio expansion	Maintaining its market position
Price	Higher price assumption after product launch	Not being afraid to set a higher price	Optimising pricing strategy	No visible change
Distribution	Contact of potential partners	Developing relationships and creating partner programmes, developing an online sales channel	Continuous development of relationships and online sales channel	Maintaining relationships and the quality of the sales channel
Promotion	Conferences, trade fairs, events, preparation of websites and social networks	Appropriate use of comparison sites, create quality online content space	Emphasis on quality content, optimisation of marketing campaigns	Created to retain customers and reach investors
External support	Consult on future marketing activities	Effective to work immediately with external marketing agency	Copywriter, analytics companies	Comprehensive use of internal resources and external agencies, analytics companies and others
Notables	Immediate creation of marketing activities	Tracking simple metrics, emphasis on obtaining quality references	Reporting, not to be afraid to spend money on marketing activities	Preparing for the highest possible valuation of a technology start-up

Source: Own processing, 2021.

the first customers and getting feedbacks. It is only with the passage of time that a technology start-up will begin to develop a business model and strategy with a specific marketing strategy.

In the first Pre-seed/Idea phase, the technology start-up develops its product as an MVP based on the market need. The technology start-up is aware of the target market segment in the future, but does not yet have a way to reach it and just anticipates the next steps in the launch. A technology start-up should definitely set the expected price higher. This stage should be a preparatory stage for an effective product launch. Therefore, the technology start-up should immediately develop the future distribution channel by direct marketing and emailing. Despite the lack of manpower and possibly finances, it is important to at least set up a simple website and social network. The use of events, conferences, trade fairs, *etc.* has a great impact immediately after the start-up is established. Marketing activities should be developed as soon as the technology start-up is formed. The start-ups under research realise in retrospect that they made a big mistake in this step.

In the second Seed/Launch stage, the technology start-up should evaluate whether the segment is ideal for targeting, has future growth potential and should not be afraid to change the targeted segment when testing the MVP. It is important to start creating marketing activities internally and with external support and to develop marketing activities as much as possible. In this stage, the focus is not only on product development, but also on the market from which information is obtained. The emphasis is also put on preparation of a quality online space for interesting content. In the future, it is effective to get good references from large customers.

In the third Growing/Scaling stage, expansion of its reach to different segments and broadening of its product portfolio can be observed. Often, in this situation, a change in the approach to pricing can be observed, with the technology start-up trying to optimise the pricing for a wider customer base. It also engages in creating interesting content, possibly with an external copywriter, and developing marketing activities not only towards customers but also towards potential investors. There is an emphasis on optimisation of marketing campaigns.

There is less data acquired in the fourth Maturity and fifth Exit/IPO/Acquisition stages. In general, these stages are preparatory stages for the highest possible valuation of the start-up by founders or investors. There are no major changes visible in key segments or product portfolio expansions. Costs should be spent on maintaining its market position and increasing the attractiveness level for a potential divestment of a technology start-up or a stock market entry.

5. Conclusion

Researching the marketing strategy of technology start-ups based on their lifecycle is a very challenging topic for the authors of this research. The aim was to develop an empirically based framework that would be an initial attempt to research in this area. In each stage, qualitative research through structured interviews of technology start-ups provided us with some insights directly from practice. This research was built on a foundation of previous research on the technology start-up lifecycle, theoretical background and appropriate research questions. The selection and development of questions underwent pre-pilot research. Some questions were subsequently modified. The research output outlines a possible empirically based framework representing a set of key points. These are perceived by the authors and the particular technology start-ups as most important to be the subject of further research. Each lifecycle stage is specific. For boosting the success of a technology start-up in the market, it is necessary to create customised marketing activities. The authors of this paper are aware that some of the information found is of a general nature and may not be perfect. But we will be unsuccessful in finding available resources related to this topic. Primary research has opened up this topic and it is necessary to research this area despite possible failure. We are aware that it is not possible to create a normative model with one research study. But in creating an activity, we can highlight this issue and encourage researchers who are concerned about creating new theories based on qualitative research. However, the effort in this area is necessary. The ambiguous definition of a start-up, technology start-up or categorisation of a start--up hinders the advancement of the body of knowledge in this area and therefore primary research methods must be developed.

The objective of this research has been fulfilled and we have obtained answers to the research questions. Based on the outcomes, some recommendations can be provided to the technology start-up in the marketing strategy area. The outputs need to be further explored and more focus needs to be placed on individual aspects of the marketing strategy. A significant limitation consists in no verification of the results and the difficulty of their interpretation. There are also limits in the form of possible personal biases and idiosyncrasies of the researchers.

The marketing strategy cannot be comprehensively included in one research. Nevertheless, this effort is important for the authors in order to provide a general overview and to raise possible questions for the future. Technology start-ups need to create an effective marketing strategy in order to increase their competitiveness in the market. We hope that based on our research output, technology start-ups can be better supported in practice.

Acknowledgement

Marketing strategy of Czech and Slovak technology start-ups in individual stages of the start-up lifecycle, Junior Specific Research Project 2021, FP-J-21-7189.

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Received: 6. 7. 2021
Reviewed: 9. 12. 2021
Accepted: 30. 12. 2021

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