

From hashtag to cashback: Success determinants in crowdfunding's user behavior

Do hashtag ao cashback: Determinantes do éxito no comportamento dos usuarios de crowdfunding

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Abstract

Crowdfunding is a popular approach for entrepreneurs to obtain financial support and has therefore gained importance in the literature and practice in recent years. The communication behavior of starters that lead to the success of a campaign will be summarized and expanded by new findings. As a theoretical added value, this article offers the first attempt to transfer communication theories to the field of reward-based crowdfunding to reveal success determinants in crowdfunding user behavior. The purpose of this paper is to give practical recommendations to starters on how to run a campaign successfully and, more generally, on how they can make full use of social media. By analyzing the dataset of crowdfunding campaigns from Startnext, the largest German-speaking reward-based crowdfunding platform, new success factors are identified using multivariate analysis methods. The results show that social media can offer significant value for businesspeople in terms of marketing if it is used strategically and frequently.

Keywords: Crowdfunding; Social Media Communication; Crowdfunding Success; Social Capital; Signaling Theory.



Resumo

O crowdfunding é un enfoque popular para que os emprendedores obteñan apoio financeiro e, por tanto, gañou importancia na literatura e na práctica nos últimos anos. Os comportamentos comunicativos dos emprendedores que conducen ao éxito dunha campaña serán resumidos e ampliados por novos achados. Como valor engadido teórico, este artigo ofrece o primeiro intento de transferir as teorías da comunicación ao campo do crowdfunding baseado en recompensas para revelar os determinantes do éxito no comportamento dos usuarios de crowdfunders. O obxectivo deste artigo é dar recomendacións prácticas aos iniciadores sobre como levar a cabo unha campaña con éxito e, en xeral, sobre como poden aproveitar ao máximo os medios sociais. Mediante a análise do conxunto de datos das campañas de crowdfunding de Startnext, a maior plataforma de crowdfunding baseada en recompensas de fala alemá, identifícanse novos factores de éxito utilizando métodos de análises multivariante. Os resultados mostran que os medios sociais poden ofrecer un valor significativo para os empresarios en termos de márketing se se utilizan de forma estratéxica e frecuente.

Palabras clave: Crowdfunding; Comunicación en medios sociais; Éxito do crowdfunding; Capital social; Teoría da sinalización.

JEL: M13; G41; L14; L26.

1. INTRODUCTION

The managerial landscape has changed significantly in recent years, meaning that business executives need to demonstrate effective and efficient behavior (Maas et al., 2019). This is even more relevant for smaller companies, where human and financial resources are often severely limited. This new approach, which fosters management and development, is known as *transformational entrepreneurship* (Maas et al., 2019). The science stream is dedicated to providing a framework for businesspeople to collaborate with financial backers and identify new ways to connect beyond the local level (Parker et al., 2016). While the innovation process is primarily concerned with the fundamental development of the product or service offered, the subsequent managerial process focuses more on building upon values for the selected customer segment in order to continually grow and adapt to customers' demands (Schmitz et al., 2017). Significant promotional activities contribute to the success of a company and can also be reflected in its rapport with customers (Calvo Dopico et al., 2021).

The idea behind potential customers being contacted is so that they can be kept informed and exchange views. It can also be an innovative and effective way of gaining ideas and designing new services or products (Mount & Martinez, 2014). By interacting intensively with the potential customers, the business owner can develop superior value for the product or service that is more meaningful to his/her target customer segments (Bogers et al., 2010). Especially when resources are scarce and market conditions are uncertain, marketing and marketing communication are essential factors for business success (Chorev & Anderson, 2006). In order for a company to grow, limited resources must be deployed profitably (Vaz, 2021). External resources can be channeled, for example, by promoting innovation by way of interaction with potential customers and by adjusting the company's business model to suit their needs (Furlan et al., 2014). One of the most immediate and cost-efficient ways for a company to interact with existing customers or draw in new ones is via social media thanks to electronic word of mouth, which stimulates purchase intention (Camoiras-Rodríguez & Varela-Neira, 2020). Therefore, companies must be actively using social media and constantly interact with core customers (Ashley & Tuten, 2015) as it has been identified as an entrepreneurial marketing tool and enabler of networking and entrepreneurial ecosystems (Secundo et al., 2021).

As crowdfunding is an innovative way for businesspeople to obtain financial resources from potential customers interested in the product or service being offered, social media plays a significant role in connecting with the public and communicating the company's vision to them (Kraus et al., 2016). Especially in reward-based crowdfunding (RbCf), comparatively little money is donated from a large number of investors, meaning that they must be contacted and have all the necessary information provided to them. For this reason, the stream of RbCf is particularly well suited to the research on the spillover effect of communication behavior.

The topic of crowdfunding combines the subareas in entrepreneurship research mentioned above and also stated again below: the connection between entrepreneurial finance, financial innovation, and the role of marketing, but also the crowdfunding platform as a digital ecosystem of exchange through the platform itself and connected social media channels.

As this article addresses several research fields and how they interrelate, the goal is to build upon knowledge about the entrepreneurial finance landscape and digital platforms in connection with the social media communication behavior of businesspeople; by doing so, key factors in communication that lead to a successful crowdfunding campaign or a new venture

in general can be revealed. To frame these communication and marketing theories and test their application in the abovementioned subject area, an empirical study has been conducted on 169 campaigns run by a German-speaking RbCf platform. By connecting these outcomes with existing knowledge from the entrepreneurial finance landscape and the social media framework, this article significantly contributes to these research fields. For this purpose, crowdfunding campaign's success factors connected to starter's user behavior have been identified.

In this context, the following research question (RQ) has been elaborated:

What are the key factors that make a campaign successful regarding the communication related user behavior of the entrepreneur on the RbCf platform itself and linked social media accounts?

This question is particularly relevant for researchers and practitioners alike. A contribution is made to social media communication in general, allowing the success factors of RbCf campaigns to be expanded. On a side note, it must also be added that research has produced comparatively few findings in this field, especially regarding the Instagram platform. The theoretical background which follows starts with a literature review on the different areas (crowdfunding, success factors of RbCf, the role of communication, and the role of social networks) to establish their reification in the next stage. The Methodology section describes the used data set and the chosen approach for evaluating the key factors in communication related user behavior that correlate with campaign success. After this, a discussion of the identified factors scrutinizes these in terms of how relevant they are for a crowdfunding campaign to be successful as well as explains which findings can be applied to further fields. The conclusion summarizes the key theories and the results and identifies further directions for research.

2. THEORETICAL BACKGROUND

An overview of crowdfunding

Currently, crowdfunding research, which is a form of digital infrastructure on the rise (Nambisan, 2017), is attracting the attention of more and more scholars as an alternative financial tool that has grown considerably in the last few years (Bernardino et al., 2021). Nevertheless, not all campaigns reach their funding goal. One of the main failures of entrepreneurs is the lack of knowledge about value creation in their products or services (Eiteneyer et al., 2019). A way to involve potential customers at an early stage, maintain the innovativeness of products and establish a financial base to implement a business model is by crowdfunding (Eiteneyer et al., 2019; Nambisan, 2017). Digital marketing strategies can raise awareness, communicate with the crowd, and encourage them to participate and invest their money in a particular crowdfunding campaign (Bernardino et al., 2021). Several studies have investigated digital communication in connection to crowdfunding (Eiteneyer et al., 2019; Kraus et al., 2016; Lu et al., 2014; Paolo Crosetto & Regner, 2014).

This paper summarizes the current state of research on crowdfunding success factors. By drawing on existing theories from the field of marketing and communication applied to crowdfunding, we discover new success factors in behavior patterns, particularly in communication, as well as recommendations for action for startups. The theoretical findings explained below firstly present the forms of crowdfunding and their success factors, move on to the role of communication tools, and finally discuss the role of networks in connection to

social media. It is the first time these research streams have been merged; crowdfunding research is a comparatively recent phenomenon, so various definitions exist without full scientific acceptance (Kraus et al., 2016). Kraus et al. (2016) state that crowdfunding focuses on raising financial support from users of devoted internet-based platforms.

Types of Crowdfunding

There are many kinds of crowdfunding, which most noticeably differ in the amount of consideration the investor is given via material or immaterial compensation (Kazai, 2011; Kraus et al., 2016; Lopez et al., 2010). These can be divided into reward-based crowdfunding, donation-based crowdfunding, crowdsourcing, and equity-based crowdfunding (Belleflamme et al., 2012; Giudici et al., 2012; Kraus et al., 2016; Mollick, 2014). In donation-based crowdfunding, donors do not expect material rewards for their contributions, but at most so-called social rewards such as acknowledgments (Giudici et al., 2012). In crowdlending, the investor offers funding and in return receives a payment agreed upon in advance (Giudici et al., 2012). The equity-based crowdfunding model turns supporters into equity stakeholders who expect to profit from the venture in the future (Mollick, 2014). Of those listed above, however, the most common model is that of reward-based crowdfunding, where financial backers receive material or immaterial compensation, such as access to a product before market launch (Mollick, 2014). This crowdfunding form is of particular interest for this study since a large number of investors are needed for a project. Thus, proper communication plays an important role.

Success factors of crowdfunding

Literature on success factors of crowdfunding projects has risen sharply in recent years (Dikaputra et al., 2019; Ferreira & Pereira, 2018; Kunz et al., 2017; Crosetto & Regner, 2014; Yeh et al., 2019). There are several ways of classifying the success factors, with Kraus et al. (2016), for example, arranging them according to preparation time and campaign duration. According to them, the way they are classified is one of the main factors for success, with campaigns by non-profit organizations, which focus more on attracting capital than on profit more likely to be successful than others (Belleflamme et al., 2010; Glaeser & Shleifer, 2001; Kraus et al., 2016). In addition, donations shortly after the launch of a campaign can have a strong signaling effect and can thus also be attributed to the success factors (Colombo et al., 2015). The target amount of the campaigns and their duration were proven to be negative on the Startnext platform in previous studies, i.e., the higher the target amount or the longer the campaign duration, the lower the probability of success (Crosetto & Regner, 2014). It is important to verify whether this also reflects the current situation, leading to the formation of hypotheses 1 and 2:

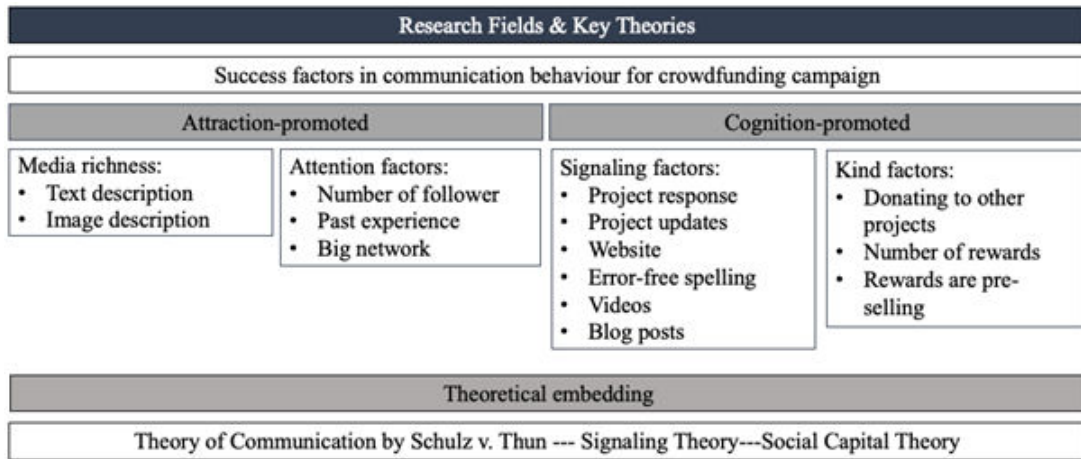
Hypothesis 1: *The lower the funding target of a reward-based crowdfunding campaign, the higher the campaign's probability of success.*

Hypothesis 2: *The shorter the duration of a reward-based crowdfunding campaign, the higher the campaign's probability of success.*

During a campaign, quality indicators include quality signals in the founder's communication (number of videos and blog posts on the platform), a high presence of pre-selling rewards, and the number of Facebook Friends (Crosetto & Regner, 2014). The video on

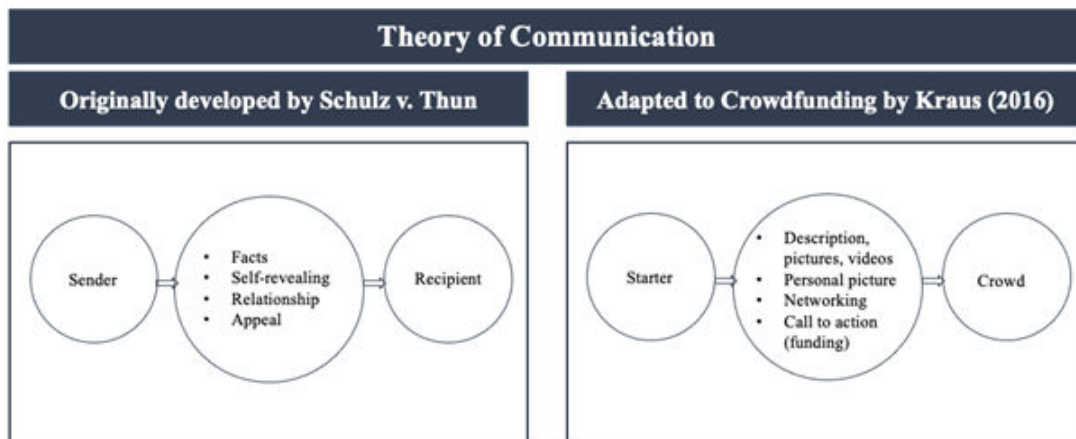
the crowdfunding platform is also of great importance, as the multimedia clip can have a significant impact on the crowd, tell the real story behind the project and introduce the starter or even the whole team (Wheat et al., 2013). By becoming acquainted with the founder, trust in the project increases (Boeuf et al., 2014).

Figure 1. Research fields and key words



Yeh et al. (2019) have classified the success factors into attraction and cognition-promoted aspects. The attraction-promoted and cognition-promoted aspects result from the categorization of information according to Figure 1 (Yeh et al., 2019). In the first category, the attraction-promoted aspects include the text description, images, Facebook Friends, and Crowdfunder experience. The more extensive the entrepreneur’s network on social media, the more likely a campaign will be successful (Ferreira & Pereira, 2018; Mollick, 2014; Yeh et al., 2019). Especially in the early stages of a project, social networking can raise the probability of receiving enough funding (Lu et al., 2014). To answer the question of as to precisely what targeted communication should look like, Schulz von Thun's Theory of Communication can be adapted to crowdfunding (Kraus et al., 2016). The original model has a sender, a four-sided message (1. Facts, 2. Self-revealing, 3. Relationship, 4. Appeal), and the recipient. Upon adapting it for crowdfunding, the project is equated with the sender, the four-sided message is the crowdfunding project [1. Description, pictures, videos, 2. Personal picture, 3. Networking, 4. Call to action (funding)], and the recipient is, in this case, the crowd (Kraus et al., 2016), who can be subsumed under the attraction-promoted factors.

Figure 2. Theory of Communication in accordance to (Kraus et al., 2016)



Hui et al. (2014) underlined that the campaign's success is determined by a mixture of information on the founder, facts about the project, customer relations and the call for funding (Hui et al., 2014). How exactly the networking and the customer relations aspects should be designed has not yet been sufficiently developed.

The second category of Cognition-promoted aspects includes Signaling factors, divided into Project response, Frequency of project updates, and an official website. In addition, the Kind factors which join the second category include funding other projects and the number of rewards that are promised to funders. The second category refers to signals that arise from social interaction, such as a frequent flow of information for updates and answers to financial backers' questions to prevent information asymmetries (Yeh et al., 2019). Error-free spelling and regular status updates on the project are essential for success (Ferreira & Pereira, 2018). The Signaling Theory can be embedded into the theoretical background of the above-mentioned success factors of a crowdfunding campaign, which is an analysis of signals and the associated situations where they occur. In particular, it reduces information asymmetries between different parties to highlight the quality of the campaign (Kunz et al., 2017; Mavlanova et al., 2012). Project owners who keep their followers updated frequently can almost double the probability of reaching their funding goal (Kraus et al., 2016). Both the method and frequency of communication are essential to increase the likelihood of success. Xu et al. (2014) attribute a far more significant increase in the probability of doing well to thorough interaction with the crowd rather than to the design of the project site (Xu et al., 2014). The critical role of communication via social networks for a crowdfunding project is also highlighted by Mollick (2014), who adds that geography can impact the project's success, such as the business founder's closeness to the crowd and potential financial backers and his/her efforts to make the campaign appeal to them as much as possible.

The Communication Theory initially developed by Schulz von Thun and adapted for crowdfunding by Kraus et al. (2016) can be applied to Yeh's classification of success factors (Kraus et al., 2016; Yeh et al., 2019). Aspects of media richness, such as text description and images, are subsumed under aspect 1. Facts. The second one, Self-revealing involves how the founder presents himself/herself, by way of a photo, for instance. One of the essential aspects which should be elaborated on is the third one, Networking. According to Signaling Theory, signal factors in the network can deliver any of the qualities that the campaign may possess to the crowd. Due to the crowd's heterogeneity, the information flow must include all four facets of communication like in Figure 2, according to von Thun. Failing that, the prognosis of

campaign success could have a negative outcome (Kraus et al., 2016). The interaction between the project owner and a potential backer can occur on any platforms, the crowdfunding platform itself, and on one or more connected social media channels (Hapsari & Sulung, 2021). This leads to the formation of the following hypotheses:

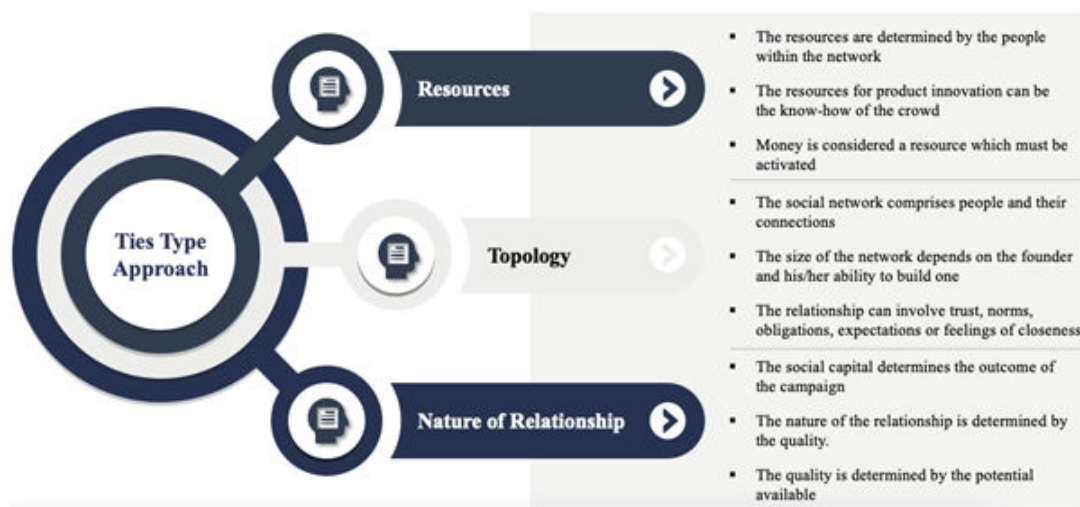
Hypothesis 3: *The more blog posts shared within a reward-based crowdfunding campaign, the higher the likelihood of the campaign's success.*

Hypothesis 4: *The more pinboard entries a reward-based crowdfunding campaign has, the higher the campaign's probability of success.*

The likelihood of success depends on the business founder's social capital and the ability to invest it correctly in accordance with his/her needs. An increase in social capital, which is the sum of resources derived from the network of relations (Nahapiet & Ghoshal, 1998), can be beneficial for the financial performance of start-ups or existing companies (Yezza et al., 2021). There are two main approaches for classifying social capital into dimensions or concepts (Sánchez-Arrieta et al., 2021), which are detailed below.

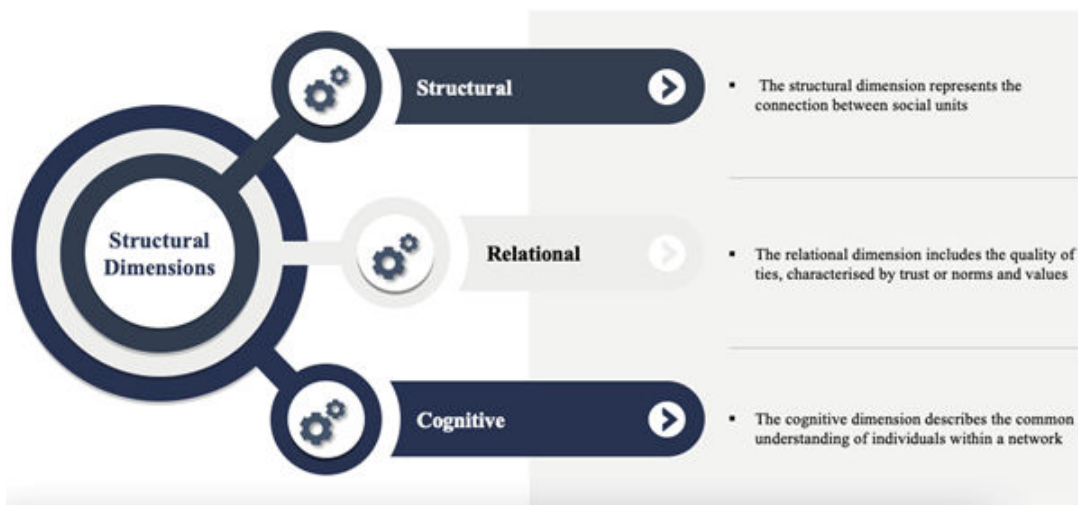
The first approach, the subdivision into a multidimensional construct (also called the resource approach), can be applied as follows: the structural dimension, which represents the connections between the social units, and the relational dimension, which includes the quality of the ties, usually characterized by trust or a similar understanding of norms and values (Eiteneyer et al., 2019; Nahapiet & Ghoshal, 1998). Lastly, the cognitive dimension describes the common understanding of the individuals in a network (Bolino et al., 2002).

Figure 3. Social Capital Concepts



The second approach, the Ties Type approach, refers to the relations themselves and the quality of their relationship (Sánchez-Arrieta et al., 2021). The people determine the resources within the network, and they can connect to each other and share know how or wealth. Topology describes those within the network and the size of it, which all depends on preferences and the ability to develop one. The quality of the network refers to the nature of relations and how much potential is available. Relations can involve expectations, obligations, trust, norms, and the feeling of closeness, and all these aspects can, in turn, influence behavior regarding participation in a crowdfunding campaign (Eiteneyer et al., 2019; Sánchez-Arrieta et al., 2021). Trust, for example, can, in turn, lead to knowledge sharing and drive transactional behavior (Chiu et al., 2006).

Figure 4. Social Capital Structural Dimensions



If Social Capital Theory is applied, social capital can be divided into internal (i.e. internal to the platform) and external (i.e. connected social media channels [Liao et al., 2015]). If this categorization is made for the abovementioned success factors, it becomes clear that much more research has been done internally on the platform, and if social media has been included at all, it is rather like a dummy variable (i.e. the account exists and may or may not be linked). In some cases, however, this distinction is not made. For example, Eiteneyer et al. (2019) have examined the connection of social capital with backer involvement in relation to product innovativeness (Eiteneyer et al., 2019). proving that founders' social capital or that of their respective teams lead backers to contribute to the campaigns, either by supplying them with know-how in product development or offering product innovation (Eiteneyer et al., 2019). It is questionable as to what extent social capital leads backers to participate in a campaign. The following diagram shows how theoretical relationships are interconnected with regard to quality signals:

Figure 5. Quality Signals



Social media can be an additional means of communication that can make use of social capital (Lu et al., 2014). For this reason, the many factors of social media channels must be examined to see which ones influence the likelihood of a project's success. Even though Facebook and Instagram have plenty in common, they differ in the way they function. To differentiate their impact on the success of a crowdfunding campaign, the following hypotheses arise:

Hypothesis 5: *The more subscribers there are on the linked Facebook page, the higher the campaign's probability of success.*

Hypothesis 6: *The more "likes" there are on the linked Facebook page, the higher the likelihood of the campaign's success.*

Hypothesis 7: *The more followers there are on the linked Instagram page, the higher the probability of the campaign being a success.*

Hypothesis 8: *The more posts there are on Facebook, the higher the campaign's probability of success.*

Hypothesis 9: *The more posts there are on Instagram, the higher the campaign's probability of success.*

Hapsariet et al. (2021) have found that linking to a Facebook account does not necessarily increase the likelihood of success. This suggests that the number and quality of interactions (activity level) and the network itself are more important for predicting success.

Hypothesis 10: *The mere inclusion of a link to the Facebook page on the crowdfunding platform for the campaign contributes to the campaign's success.*

Hypothesis 11: *The mere inclusion of a link to the Instagram page on the crowdfunding platform for the campaign contributes to the campaign's success.*

Startnext, like many other crowdfunding platforms, allows the inclusion of a link to social media platforms on the campaign page. In turn, the link to the campaign page can be integrated on each platform (Xu et al., 2014). The characteristics of social media, including the fact that it is highly dynamic and has an extensive reach, can be actively used to achieve benefits for one's own campaign (Xu et al., 2014). Furthermore, paid advertisements are an option on social media sites, which immediately provides the link to the campaign webpage, whereby specific, predefined target groups can be addressed at certain times, and there is significantly less wastage in communication (Xu et al., 2014). Age, gender, and interests can be defined, and the geographical framework means that previously gained knowledge about regional advantageousness through regional affiliation can be applied directly. In addition, the trust factor, which according to Social Capital Theory, helps determine the quality of the relationship, can be strengthened by using a social media account (Cumming et al., 2016). A social media presence is a strong indicator that fraud has not occurred because potential backers can quickly track further activities on the account; fraud is much more difficult to commit and is also easier to detect when it does happen (Cumming et al., 2016). However, a linked social media profile is not always a quality signal. If it has a really small number of followers, it can deter potential backers (Mollick, 2014). To the best of our knowledge, there are no studies to date that go beyond the mere effect of the link to a social media account and its contribution to the success of a campaign. Instagram, in particular, has been largely left out of the equation, and only the effect of Facebook and Twitter has been considered so far (Kraus et al., 2016; Crosetto & Regner, 2014).

3. METHODOLOGY

Data Set and Sample

This study aims to develop upon the knowledge about success factors for a crowdfunding campaign and connect theoretical concepts of the Social Capital Theory, the Signaling Theory, and the Communication Theory by Schulz von Thun and elaborate new assumptions within a conceptual, theoretical framework. The goal is to discover which derived key factors in the communication behavior of founders are most likely to lead to a campaign's success.

To elaborate this, data has been cumulated from the largest reward-based crowdfunding platform in Germany, called Startnext. This, just like global counterparts such as Kickstarter and Indiegogo, represents a platform on which transactions can be carried out, with the necessary legal framework being done behind the scenes. The funding volume in February 2022 reached around €130,370,000 with 1,888,000 registered users and 13,121 successful projects. The starter can choose to run a campaign for a minimum of 10 to a maximum of 90 days (Crosetto & Regner, 2014). Every campaign page consists of a video, a funding target, the campaign's duration, the project's description, a pinboard, a blog section, and the reward levels, which backers obtain when the funding target is reached. A campaign's success can only be achieved if the funding sum is reached in the period chosen by the founder and backers will also only receive the promised reward in this scenario. If the funds raised are not paid out owing to a campaign's failure, all payments made up to that point will be refunded. During the study, a total of 169 campaigns were observed, and a Web Scraper gathered the corresponding data. Canceled and non-launched campaigns were eliminated from the data set. The data collection period covered from 6th January 2020, the date of the first campaign to 27th April 2020, when the last campaign ended. The following data was extracted daily throughout the campaigns: pinboard posts, blog posts, funding, Instagram subscribers, Instagram posts (with content, number of likes and comments), Facebook subscribers, Facebook "likes," and Facebook posts (with content, number of likes and comments). In addition, unique contact information, rewards, and funding periods were sourced. Based on the Signaling Theory, the Theory of Communication by Schulz von Thun, and the Social Capital Theory, eleven hypotheses were developed to address the research question, namely, which key factors in starters' user behavior lead to campaign success, with a focus on the use of network effects and considering the communication aspect. The following hypotheses in Figure 6, which are derived from the theoretical part, are analyzed by the gathered data set.

Figure 6. Hypotheses

Numeration	Hypothesis
H1	The lower the funding target of a reward-based crowdfunding campaign, the higher the campaign's probability of success.
H2	The shorter the duration of a reward-based crowdfunding campaign, the higher the campaign's probability of success.
H3	The more blog posts shared within a reward-based crowdfunding campaign, the higher the likelihood of the campaign's success.
H4	The more pinboard entries a reward-based crowdfunding campaign has, the higher the campaign's probability of success.
H5	The more subscribers there are on the liked Facebook page, the higher the campaign's probability of success.
H6	The more "likes" there are on the linked Facebook page, the higher the likelihood of the campaign's success.

Numeration	Hypothesis
H7	The more followers there are on the linked Instagram page, the higher the probability of the campaign being a success.
H8	The more posts there are on Facebook, the higher the campaign's probability of success.
H9	The more posts there are on Instagram, the higher the campaign's probability of success.
H10	The mere inclusion of a link to the Facebook page on the crowdfunding platform for the campaign contributes to the campaign's success.
H11	The mere inclusion of a link to the Instagram page on the crowdfunding platform for the campaign contributes to the campaign's success.

Operationalization of Variables

The dependent variable is campaign success, defined as reaching the funding goal. Thus, this variable is measured on a binary scale and assigned 1 if the funding target was reached, and 0 if it was not reached, in the selected period. If the initial funding amount set by the starter is not reached, the contributions made up to that point will be returned to the backer, and the project will not receive any money. If this occurs, the success of the campaign becomes negated (=0). If the funding goal is accomplished by reaching the initial set amount of money during the campaign period, the campaign is considered successful, and the starter receives the funding for his/her project (=1). The independent variables are classified in Figure 7, labeled “dichotomous” or “metric”, with the abbreviations used in the study, assigned to the hypothesis under evaluation:

Figure 7. Variable Classification

Abbreviation	Variable	Measurement Level	Assigned Hypothesis
S	Success of Campaign	dichotomy	All
FA	Funding Amount	metric	H1
D	Campaign Duration	metric	H2
B	Blog Entries	metric	H3
P	Pinboard Posts	metric	H4
FF	Facebook Follower	metric	H5
FL	Facebook Likes	metric	H6
IF	Instagram Follower	metric	H7
FP	Facebook Posts	metric	H8
IP	Instagram Posts	metric	H9
LF	Link to Facebook	dichotomy	H10
LI	Link to Instagram	dichotomy	H11

External social capital is raised through the linked Facebook and Instagram channels with all factors corresponding to them. Communication with internal social capital includes platform-internal exchange.

4. RESULTS

To classify the findings and determine which factors affect the success of a campaign, the investigation starts with descriptive statistics, divided into dichotomy and metric variables and continues with the analysis of the binary logistic regression.

Descriptive Statistics

The metrically scaled variables were examined in the descriptive analysis with the most important statistical values. In contrast, the nominally scaled variables were evaluated only with their frequencies. [Figure 8](#), below, summarizes the most important descriptive statistics for the nominally scaled variables.

Figure 8. Descriptive Statistics

Variable	Mean	Median	Std. Deviation	Variance	Skewness	Kurtosis
FA	9471.69	4500.00	32367.747	1047671023.556	10.842	128.991
D	35.70	34.00	12.135	147.264	1.190	3.749
IP	6.43	2.00	9.102	82.845	1.817	3.456
IF	882.99	109.50	5448.124	29682055.946	11.788	146.187
FP	5.98	2.00	8.513	72.473	2.247	7.604
FL	656.83	84.50	1618.279	2618827.940	4.154	19.503
FF	605.82	81.50	1400.023	1960063.912	3.709	14.139
B	0.83	0.00	1.967	3.868	3.938	18.779
P	1.83	1.00	3.457	11.948	5.408	35.417

In the descriptive analysis of the metric variables in [Figure 8](#), outliers in the funding target are conspicuous. They are not adjusted because they reflect reality, where the targets have a high variance. Other values identified as potential outliers do not represent erroneous distorting values upon review, meaning that no adjustment takes place in this respect. Further tests for outliers are performed as part of the following binary logistic regression for nominal variables: Campaign success (S), linking Instagram account on campaign page (LI), and linking Facebook account on campaign page (FV). Frequencies have been examined with 66.7% of the campaigns being successful, 62.5% of them linked to an Instagram account and 59.5% to a Facebook one.

Figure 9. Correlations

		Success	Link to Instagram channel	Link to Facebook channel
Success	Pearson Correlation	1	.130	.214**
	Sig. (2-tailed)		.092	.005
	Sum of Squares and Cross-products	37.333	5.000	8.333
	Covariance	.224	.030	.050
	N	168	168	168
Link to Instagram channel	Pearson Correlation	.130	1	.263**

		Success	Link to Instagram channel	Link to Facebook channel
Link to Instagram channel	Sig. (2-tailed)	.092		<.001
	Sum of Squares and Cross-products	5.000	39.375	10.500
	Covariance	0.30	.236	.063
	N	168	168	168
Link to Facebook channel	Pearson Correlation	.214**	.263**	1
	Sig. (2-tailed)	.005	<.001	
	Sum of Squares and Cross-products	8,333	10.500	40.476
	Covariance	.050	.063	.242
	N	168	168	168

When correlating the nominal variables' success and linking it on the campaign page to the Facebook or Instagram accounts, it is interesting to note that it is only the link to the Instagram account that is significant (see [Figure 9](#)). The metric variables in [Figure 8](#), (FL) Facebook Likes and (FF) Facebook followers, have also been tested for their Pearson correlation coefficient, where there is a strong positive correlation, $r=.827$, $p<.001$. This may be because becoming a fan of a page automatically results in a Like. Here, users must first be active for this automatism to be reversed, resulting in the decision to exclude the Facebook followers variable (FF) in the binomial logistic regression as an input factor, which reflects the same aspect and explanatory approach due to the identical underlying network.

Multivariate Approach

Logistic regression is calculated to evaluate whether the current data set can provide a significant contribution to clarifying the query over which factors influence campaign success. The goal of logistic regression is to find probabilities for the occurrence of either of the campaign outcomes, i.e. success or failure. Since the dependent variable is dichotomous, a binary logistic regression must be calculated ([Backhaus et al., 2018](#)). The underlying binary logistic model is:

$$\pi(x) = \frac{1}{2 + e^{-z(x)}} = \frac{1}{1 + e^{-(a + \beta_1 x_1 + \dots + \beta_j x_j)}}$$

The requirements for performing a binary logistic regression can be confirmed. Both the sample size and the classification of the variables are large enough. The dependent variable must be dichotomous, whereas the independent ones must be categorical or at least interval scaled, which is the case for the data set used. Furthermore, linearity can be assumed after it is tested by the Box-Tidwell method and then applying the Bonferroni correction ([Box & Tidwell, 1962](#); [Tabachnick & Fidell, 2007](#)). Testing for multicollinearity has revealed a low correlation between predictors ($r<.60$), which does not further affect the subsequent analysis ([Backhaus et al., 2018](#)). In the binomial logistic regression performed below, the variable success (S) is the dependent variable which needs to be explained. FA, D, B, P, FL, IF, FP, IP, LF and LI are the independent variables. This results in the following regression model:

$$S(\text{Success}=1) = \frac{1}{1 + e^{-(\beta_0 + \beta_1 * FA + \beta_2 * D + \beta_3 * B + \beta_4 * P + \beta_5 * FL + \beta_6 * IF + \beta_7 * FP + \beta_8 * IP + \beta_9 * LF + \beta_{10} * LI)}}$$

In the model calculation, classification plots, the Hosmer-Lemeshow goodness-of-fit, the case-wise listing of the residuals, the correlation of the estimates, and the 95% confidence interval for exp(B) need to be reported. The procedure for variable selection is inclusion. In the case-wise listing, values which lie outside of two are indicated as outliers.

Figure 10. Variables in the Equation

	B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I. for EXP(B) Lower	Higher
Funding target amount in euros	,000	,000	12,237	1	<,001	1,000	1,000	1,000
Duration of campaign in days	-,032	,016	4,033	1	,045	,968	,938	0,999
Number of blog posts	,092	,105	,765	1	,382	1,096	,893	1,346
Number of pinboard posts	,031	,080	,146	1	,702	1,031	,881	1,207
Number of Facebook Likes (end of campaign)	,000	,000	,057	1	,811	1,000	1,000	1,000
Number of followers on Instagram (end of campaign)	,000	,000	,135	1	,714	1,000	1,000	1,000
Number of posts on Facebook (during the campaign)	,153	,053	8,299	1	,004	1,165	1,050	1,293
Number of posts on Instagram (during the campaign)	,006	,030	,042	1	,838	1,006	,949	1,066
Link to Facebook account	-,107	,519	,042	1	,837	,899	,325	2,484
Link to Instagram account	,434	,490	,785	1	,376	1,544	,591	4,032
Constant	1,691	,635	7,097	1	,008	5,423		

The regression model is statistically significant, $\chi(10) = 46.031$, $p < .001$, with an acceptable variance resolution of Nagelkerkes $R = .333$. The classification is correct in 78.6% of cases, with a sensitivity of 94.6% and a specificity of 46.4%. Three out of the ten variables in Figure 10 included in the model are significant: Funding target amount in euros ($p < .001$), Duration of the campaign in days ($p < .05$), and Number of Posts on Facebook ($p < .005$). The other variables in Figure 10, namely, Link to Instagram account ($p = .376$), Number of posts on Instagram ($p = .838$), Number of followers on Instagram ($p = .714$), Link to Facebook account ($p = .837$), Number of Facebook Likes ($p = .811$), Number of blog posts ($p = .382$), and Number of pinboard posts ($p = .702$), do not significantly affect the predictive performance of the model. A higher funding goal has a negative effect on the probability of success, with an odds ratio of 1.000 (95% CI [1.000, 1.000]), as does a longer campaign duration, with an odds ratio of 0.968 (95% CI [0.938, 0.999]).

Robustness Check

One independent variable has been added to the model to check the results for robustness of regression. The author has added the age of the starter as an additional variable. The robustness check shows significant results that are consistent with Figure 10. Based on the results, starters' ages have no significant effect on the success of crowdfunding projects.

Therefore, it can be concluded that the results of the robustness check are consistently significant and aligned with the results in [Figure 10](#).

5. DISCUSSION

Crowdfunding currently represents a serious alternative form of financing for startups that are gaining in popularity. The collected dataset provides an insight into the interrelationship between the success of a campaign and the communicational behavior factors leading to support from backers.

The descriptive statistics show a high standard deviation for the following factors: the number of Facebook followers / Facebook “likes” and the funding target amount. The mean values far above the median reflect the comprehensive spectrum of the data set. A high standard deviation for Facebook followers must also be considered when interpreting the results. The impact from user behavior will not always yield the same success, for example, if the network with which the information is shared consists of 100 instead of 100,000 people, implying that the model cannot control this confounding variable. In addition, the internal appeal of a campaign should be considered because the more interesting, meaningful, or appealing it is, the larger the group of people will be, which can also affect user behavior outside the platform and ultimately, the funding.

As for the independent variables, they correlate with each other, being particularly evident in the factors relating to social media, which is owing to the general social media affinity that some users have. Since the binary logistic regression analysis performed is significant, it contributes to the research on the success factors in reward-based crowdfunding. With an overall score of 78.6%, the classification is of significant predictive power. The correct prediction value for whether campaigns will be successful or not is 94.6% in total, which is much higher than that of predicting failures, at 46.4%. This may be because some of the variables in the data set are derived from the literature on success factors or at least can be presumed to contribute to success.

The first variable to be interpreted in [Figure 10](#), the funding target amount in euros allows H1 to be analyzed. The variable makes a significant contribution to the model's classification performance with ($p < .001$). The odds ratio is 1.000, which means that increasing the funding target by €1 reduces the campaign's chance of success by 0.0137% and vice versa. Since the jumps in funding targets usually move in larger steps, a significant influence on the probability of success is quickly possible. Accordingly, Hypothesis 1 *“The lower the funding target of a reward-based crowdfunding campaign, the higher the campaign's probability of success.”* can be confirmed in [Figure 11](#). This result is consistent with the findings of [Mollick \(2014\)](#) and [Cordova \(2015\)](#) ([Cordova et al., 2015](#); [Mollick, 2014](#)).

Figure 11. Hypotheses Validation

Numeration	Validation	Hypothesis
H1	✓	The lower the funding target of a reward-based crowdfunding campaign, the higher the campaign's probability of success.
H2	✓	The shorter the duration of a reward-based crowdfunding campaign, the higher the campaign's probability of success.
H3	-	The more blog posts shared within a reward-based crowdfunding campaign, the higher the likelihood of the campaign's success.

Numeration	Validation	Hypothesis
H4	-	The more pinboard entries a reward-based crowdfunding campaign has, the higher the campaign's probability of success.
H5	-	The more subscribers there are on the liked Facebook page, the higher the campaign's probability of success.
H6	-	The more "likes" there are on the linked Facebook page, the higher the likelihood of the campaign's success.
H7	-	The more followers there are on the linked Instagram page, the higher the probability of the campaign being a success.
H8	✓	The more posts there are on Facebook, the higher the campaign's probability of success.
H9	-	The more posts there are on Instagram, the higher the campaign's probability of success.
H10	-	The mere inclusion of a link to the Facebook page on the crowdfunding platform for the campaign contributes to the campaign's success.
H11	-	The mere inclusion of a link to the Instagram page on the crowdfunding platform for the campaign contributes to the campaign's success.

When it comes to the campaign's duration, it has been found to make a significant contribution ($p > .05$). The significance of the odds ratio of 0.968 is particularly interesting, as this means that the chance of the campaign having a successful outcome decreases by 3.2% per additional day. Thus, the statement of hypothesis 2: *"The shorter the duration of a reward-based crowdfunding campaign, the higher the campaign's probability of success"* can be confirmed by the inverted odds ratio. This finding is consistent with that of [Mollick \(2014\)](#) and [Harzer \(2013 \[Harzer, 2013; Mollick, 2014\]\)](#). In terms of the Signaling Theory, an appropriate choice of duration can therefore suggest to the potential backer solid proof of reaching the fund target within the allotted timeframe.

Another highly significant factor influencing a campaign's success is the amount of Facebook posts there are ($p < .005$). The odds ratio, at (1.165), provides surprising findings in this context. If you increase the number of posts during the campaign, the probability of success increases significantly by an average of 16.5%. However, it is also essential to consider the content level. The post should be meaningful for the campaign and simply posting for the sake of posting will not offer any added value. With this in mind, H8 can be confirmed: *"The more posts there are on Facebook, the higher the campaign's probability of success."* The connection between Signaling Theory and Communication Theory can be established by explaining posting behavior. The former includes the posting behavior of the starter as a quality signal with regard to transparency and openness to avoid information asymmetries, which it sends out to potential backers ([Dikaputra et al., 2019](#)). In addition, the four facets of the message, according to Schulz von Thun's Theory of Communication, should be applied ([Kraus et al., 2016](#)).

In addition to the significant factors, other variables are interpreted below, despite their lack of significance. Concerning the number of blog posts having a major influence, it can be refuted and so can hypothesis H3 with regard to our data set: *"The more blog posts shared within a reward-based crowdfunding campaign, the higher the likelihood of the campaign's success."* However, this contradicts findings by [Mollick \(2014\)](#) and [Crosetto & Regner \(2014\)](#). On the one hand, this could be due to the fact that these studies were conducted more than 10 years ago, when the importance of social media was not as evident as it is today; on the other hand, at least in the case of [Mollick \(2014\)](#), it could be because a different platform was used. At the same time, the fact that starters used these tools during the campaign may have made

internal communication on the platform very weak, hence making it difficult to investigate the influence of blog posting on the success of the campaign.

To draw the discussion section to a close, the analysis confirms that success can be predicted and guided by the starters themselves if they consider a few crucial factors in their communication behavior on the platform and linked social media accounts. Although the odds ratio value (1.096) suggests that a positive relationship exists between blog posts and campaign success, it is not strong enough for the data set to confirm a significant relationship. Here, too, when it comes to Signaling Theory, the classification into quality signals is still conceivable, even if the correlation is not significant. This could be due to the fact that signals cannot be cumulated, which nevertheless does not deny the general benefit of blog posts for starters (Courtney et al., 2017).

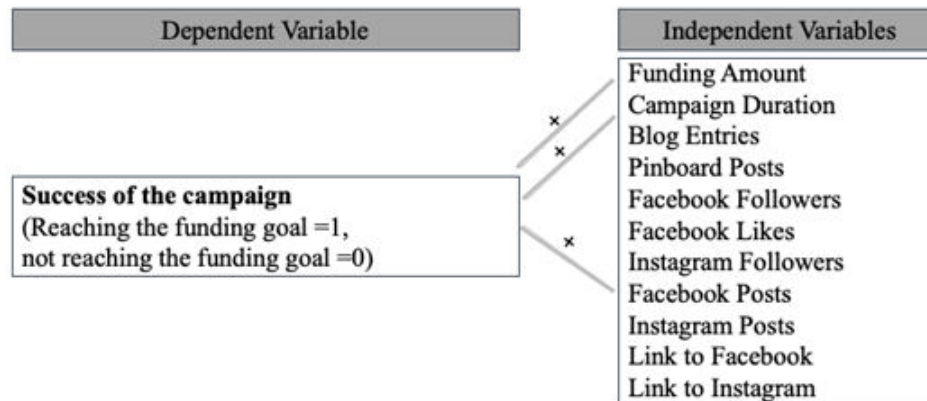
The fourth hypothesis, "The more pinboard contributions a reward-based crowdfunding campaign has, the higher the campaign's probability of success," must also be rejected for lack of significance. As with the number of blog posts, the odds ratio (1.031) indicates a positive correlation. Also, H10 and H11, "*The mere inclusion of a link to the Instagram/Facebook page on the crowdfunding platform within the campaign contributes to the campaign's success.*" must be rejected, because the significance is not given. Even if the odds ratio is positively related to the probability of success this time, the data set does not provide a qualified confirmation of an increased chance of success. Since a mere link offers no added value, the network behind it on the social media account also needs to be sufficiently large and interesting.

Hypothesis 5 "*The more subscribers there are on the linked Facebook page, the higher the campaign's probability of success.*" and Hypothesis 6 "*The more "likes" there are on the linked Facebook page, the higher the likelihood of the campaign's success.*" can be tested together as a whole. The similarity in terms of content and the steps you need to follow, namely that you can only become a fan or follower of a Facebook page if you select the "like" button, makes the connection between these two hypotheses clear. Due to the lack of significance of this variable ($p = .811$), both hypotheses must be rejected. Also, H7, "*The more followers there are on the linked Instagram page, the higher the probability of the campaign being a success.*" must initially be rejected due to lack of significance ($p = .714$). This is surprising, as the results contradict the opinion-leading results of Mollick (2014). For Hypothesis 9, "*The more posts there are on Instagram, the higher the campaign's probability of success.*", the significance must be refuted ($p = .838$). This is also initially unexpected, especially given the higher significance of Facebook posts under hypothesis 8. However, social media sites can also differ concerning the age of their users. In this case, it could influence the result insofar as the average age for this data set is almost 36. Each social media platform has a different average age. For example, some such as Instagram tend to be preferred by the younger target group up to around their late 20s, whereas Facebook users are often older. Since the average age of our data set is just under 36, it suggests why Facebook posts might reveal a more significant correlation in this case.

Even if the results provide valuable insights, they must be evaluated critically due to the large number of interfering variables that exist but are omitted. For example, it is very possible for a project to have internal appeal, which may have a completely different emotional impact on investors than another project. One campaign may simply be better and more meaningful than another and be successful as a result without communication-related aspects being involved. These confounding variables are not controlled by this study and can jeopardize the internal validity of the results. In addition, not all the variables that have ever been identified in the literature as influencing variables have been included. The focus here is primarily on user behavior regarding social media. Points such as the experience of founders,

for instance, or whether it is a group or individual startup are entirely disregarded. The influence of the independent variables on the dependent variable “Success of the campaign” is shown in Figure 12.

Figure 12. Influence of Variables



From this result, starters can derive practical implications and increase the likelihood of success for their future campaigns by leveraging the factors that positively influence campaign success. It is advisable to constantly engage with target group-specific social media accounts at regular intervals in order to reduce information asymmetries and contact potential backers. In addition, the funding amount should be selected appropriately, and the campaign time should not last for too long. A shorter duration suggests the confidence to reach the campaign goal in a reasonable time.

6. LIMITATIONS

The analysis is built on data from a reward-based crowdfunding platform, which means that the findings may not be transferable to other crowdfunding platforms. Furthermore, we gathered the dataset from the largest German-speaking platform. Results must be empirically verified in an international context, as different requirements should be considered, especially concerning communication patterns and nationality.

The applied analysis excludes the content analysis of the social media postings. These insights would emerge with our findings. In terms of the validity of the results, it would be interesting to check whether a new data set from the same platform leads to similar results.

When it comes to the issue of confounding variables, it is an important point that affects the study's internal validity and may contaminate the results. The founding team, the founder's experience, the attractiveness of the campaign, and the curation function embedded on the Startnext site are not included here. Curation by, for example, large companies that promote sustainable projects and identify them on the campaign page can also be an essential factor that affects the success and has signal strength. Points such as backers' liquidity being influenced by the campaign's duration and start, and end time (beginning, middle, or end of the month) can also play roles as disruptive factors since these are relatively small investments on the part of the backer. Here the liquidity is mostly guaranteed. For further research approaches, it would be interesting to examine in a holistic approach how communication-related variables are weighted in terms of success in direct comparison. A

large-scale international long-term study would be advisable to eliminate or at least minimize further limitations such as international transferability or short-term trends.

Concerning the age structure and the use of the various channels, the explanatory approaches in this study are based on assumptions, as the ages needed to remain anonymous and thus could not be assigned to individual user behavior. In addition, platforms such as Twitter and TikTok were left entirely out of the study. Twitter was excluded because it had already been addressed in many previous studies. Linking to TikTok is not yet available on Startnext, even though this application is becoming increasingly important, especially in the younger age segment.

7. CONCLUSION

The study contributes to the literature on entrepreneurship, entrepreneurial finance, and innovation with the main focus on success determinants in reward-based crowdfunding campaigns, which are related to users' communication behavior. The literature on crowdfunding, especially the convergence of social media use with entrepreneurship, is still in its infancy. A correlation between quality signals in communication for potential investors during the campaign has been confirmed both from the framework of this study and from previous studies (Mollick, 2014; Paolo Crosetto & Regner, 2014).

After evaluating the core literature, the importance of quality signals for reducing information asymmetries has become clear. Potential investors must be kept informed via a constant exchange and flow of information to maintain their interest in the project and inspire confidence.

Regarding the research question *"What are the key factors that make a campaign successful regarding the communication-related user behavior of the entrepreneur on the RbCf platform itself and linked social media accounts?"* it should be noted that the number of Facebook posts can have a strong influence on success. Even though the correlation is not directly significant, but positive, regular maintenance of blog posts and pinboard posts are recommended. Even though the available data set could not prove the significance of Instagram for RbCf, it might be due to the age structure of the sample. Therefore, this platform should not be disregarded in future campaigns. The increase in the probability of success from the number of Facebook posts by such a significant percentage per additional post is substantial and of great value for further research and practitioners. Signaling Theory plays a vital role in categorizing variables that exhibit quality signals. Even in the absence of significance, the signal strength can be affirmed. It would be interesting to classify the strength and rank it for the data studied here. Regardless of the results indicating that networking and communication with the crowd are relevant for campaign success, many founders fail to build a community, either within the platform or on their social media accounts. To investigate this phenomenon, a more in-depth study of user behavior on digital platforms in the context of crowdfunding is highly recommended (Hui et al., 2014). Future research should investigate causes for how users behave to find out why they do not do so in accordance with the recommendations for use, even if these are known. It would be reasonable to categorize the different personalities of starters regarding their communication behavior and derive recommendations for action accordingly. Kraus et al. (2016) distinguished, for example, between "communicator," "networker," and "self-runner." According to the Social Capital Theory, the Ties Type approach differentiates between the quality of the starters' network and the ties to make sufficient emphasis to lead the project to success (Kraus et al., 2016).

Social media leads to a real-time increase of market data from customers, which might be useful for generating product innovation and tailoring services to customers' needs, which would in turn allow for a competitive advantage. Future research might follow up this approach by tracking how the companies initiate and implement this into the innovation process.

In conclusion, the focus on success-increasing factors in the user behavior of startups in the communications arena for a reward-based crowdfunding campaign has indeed created a great deal of added value for research, especially for entrepreneurship. The findings can also be applied to other areas in business management and contribute to making the company more successful. It is essential to communicate with potential supporters and customers in a targeted manner and make the company's networks grow. Constant interaction with the crowd offers added value in many respects, as confirmed by the analysis.

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