

## Crowdfunding in high-tech entrepreneurship

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The purpose of the paper is to provide the characteristics of crowdfunding as an alternative financial instrument, to disclose difference between the concepts of crowdsourcing, crowdfunding and crowdfunding, to develop crowdfunding classification for systematization information with a view to realizing further more detailed researches. Together with scientific value is worth noting the practical value of the paper, which is in the elaboration of guidelines for the development of small business in Ukraine due to the using of crowdfunding models.

**Keywords:** crowdfunding, investments, innovations, high-tech, crowdfunding, crowdsourcing.

Боровікова А.І., Ширяєва Н.В. КРАУДФАНДІНГ В ВИСОКОТЕХНОЛОГІЧНОМУ ПІДПРИЄМНИЦТВІ  
Стаття присвячена опису характеристик краудфандінга як альтернативного фінансового інструменту, розкриття різниці між концепціями краудсорсингу, краудфандінга і краудінвестинга, розробці класифікації краудфандінга для систематизації інформації з метою реалізації подальших більш детальних досліджень. Разом з науковою цінністю варто відзначити практичну цінність статті, яка полягає в розробці керівних принципів для розвитку малого бізнесу в Україні за рахунок використання моделей краудфандінга.

**Ключові слова:** краудфандінг, інвестиції, інновації, хай-тек, краудінвестинг, краудсорсинг.

Боровикова А.И., Ширяева Н.В. КРАУДФАНДИНГ В ВИСОКОТЕХНОЛОГИЧЕСКОМ ПРЕДПРИНИМАТЕЛЬСТВЕ

Статья посвящена описанию характеристик краудфандинга как альтернативного финансового инструмента, раскрытию разницы между концепциями краудсорсинга, краудфандинга и краудинвестинга, разработке классификации краудфандинга для систематизации информации с целью реализации дальнейших более детальных исследований. Вместе с научной ценностью стоит отметить практическую ценность статьи, которая заключается в разработке руководящих принципов для развития малого бизнеса в Украине за счет использования моделей краудфандинга.

**Ключевые слова:** краудфандинг, инвестиции, инновации, хай-тек, краудинвестинг, краудсорсинг.

**Relevance of the crowdfunding** is a new possibility of informal financing for creative founders, it provides new ways in which seed capital can be raised from the general public. What has recently brought it into limelight is the blend of technology advancements and the impacts of the financial crisis that opened a new opportunities to bring innovations to life.

Ever since the invention of the internet, and its applications in households it has allowed for the introduction of a new marketplace where sellers can present goods to customers regardless of time and place. Online shops like Amazon or eBay have in little over twenty years become the shopping centres of the twenty first century with combined revenues of over US\$ 100 billion in 2014 (Amazon.com, 2015; eBay, 2015). This shift away from a traditional brick-and-mortar marketplace has allowed for the introduction of another more recent phenomenon – crowdfunding.

**An inherent problem** that entrepreneurs face at the very beginning of their entrepreneurial initiative is to attract outside capital, given the lack of collateral and sufficient cash flows and the presence of significant information asymmetry with investors (Cosh et al., 2009). While different investors exist for larger amounts of capital such as VC funds and banks, entrepreneurial initiatives that require much smaller amounts to start with need to rely on friends and family or own savings. They then also make extensive use of bootstrapping techniques to mitigate their financial constraints (Bhidé, 1992; Winborg and Landstrom, 2001; Ebben and Johnson, 2006), by boosting their short-term profits.

**The aim of the article** is to provide the characteristics of crowdfunding as an alternative financial instrument, to disclose difference between the concepts of crowdsourcing, crowdfunding and crowdfunding, to develop

crowdfunding classification for systematization information with a view to realizing further more detailed researches. Together with scientific value is worth noting the practical value of the article, which is in the elaboration of guidelines for the development of small business in Ukraine due to the using of crowdfunding models.

**Method of investigation.** The methodological basis of the study is the dialectical method of scientific knowledge, systematic approach, the fundamental provisions of the current economic theory, theory of financial analysis. Theoretical study of organizational and economic support effectiveness of marketing activities of agricultural enterprises and develop scientifically grounded mechanism for its implementation.

**Main material.** Accepted assume that the term “crowdsourcing” was first taken by Jeff Howe in his article “The Rise of Crowdsourcing” in 2006. In accordance with Collins English Dictionary under the term “crowdsourcing” should be understood a transfer of work to the public, usually by making a call to the public mostly through the Internet. The Oxford Dictionary gives the following interpretation of the term “crowdsourcing”: the process of obtaining information or a contribution into a specific project by involving services of many people, paid or unpaid, usually via the Internet. So, crowdsourcing is a transfer certain duties to large number of people who are united by the idea and willing to provide some services on a voluntary basis (or for a small payments) without a labor contract. The world examples of crowdsourcing application are:

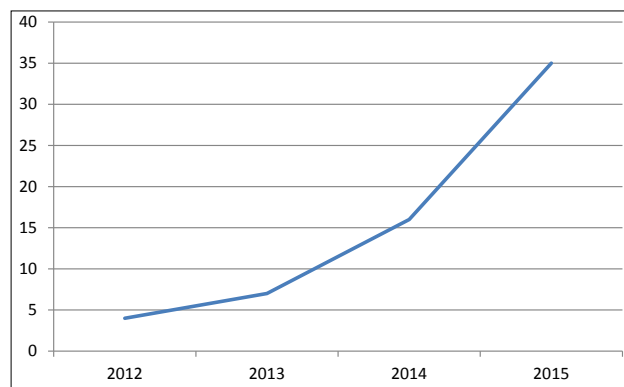
Google translator: it is possible for all users to correct proposed translations and add new words for improving translation [9];

Online encyclopedia Wikipedia: anyone can write and edit encyclopedia article, translate and create new topics;

Network Facebook: content of pages was translated into all languages of the world in 2008 thanks to the users of this network.

The active application of crowdsourcing shows that people are able to cooperate and ready to do something for the project essential functions for free. Based on this practice, a new concept of “crowdfunding” is developed. Realization of online campaign for the rock group Marillion is considered as a first example of crowdfunding in the modern sense of this term. Fans of rock group created online campaign for fundraising via Internet for the purpose to ensure the implementation of Marillion music tour. The campaign was successful, as the group has col-

lected more than 60 thousand dollars. After this chancy case members of the rock band started their own crowdfunding campaigns in order to record their next albums. From the examples it is clear that the concept of “crowdfunding” should be understood as a process of obtaining money to finance the business and social projects from large number of people. This definition can be linked within any fundraising, such as donations to churches or collecting donations during the wars. But the term “crowdfunding” was firstly published only in 2006. Therefore, it is reasonable to add to this determination mode of raising funds – social networking or special crowdfunding platforms. The term “spilnokosht” can be considered as an analogue of notion “crowdfunding” in the Ukrainian language which started to be applied after the creation of the first crowdfunding platform in our country. In Ukraine, the raising of funds for building a “Hospital of the Future” is considered as first crowdfunding project. The project was started in 2006, it collected 1 million dollars and 84 million hryvnas, but in the 2010 hospital construction was halted by letter of the State Administration. According to the data referred in the statement of one of the most influential consulting firms Massolution, the total amount of funds raised by crowdfunding method doubles every year since 2012. In 2015 the total monetary value of all crowdfunding transactions amounted to about 34 billion dollars (Fig. 1).



**Fig. 1. Dynamics of crowdfunding operations in the world**

Practical using of “crowdfunding” requires the development of classification crowdfunding on various grounds (Table 1).

Crowdfunding with financial remuneration (or crowdinvesting) can be divided into 3 types due to the model of investment. First type is P-2-P lending (or corporate financing). It provides the donations in exchange on obligation of author of project to return borrowed funds and pay

predetermined interest. The advantage for the author of the project is the possibility to negotiate the interest and graphic of payments (those interests are much smaller than in financial and credit organizations). For the donor (investor) the advantage is the existence of considered graphic of payments. Investor has all the necessary information. Only individuals can be donors. The examples of such crowdfunding platform type are: Funding Circle, Zopa, Babyloan and KIVA. The second type of crowdfunding with financial reward is equity-based crowdfvesting. This model consists in that the donor receives part of property of the company or its shares in order to obtain dividends or participate in management. Examples of this type of platform is Seedrs and EquityNet. The third type of crowdin-

vesting is royalty-based crowdfvesting. In this way donors are funding their right to receive interest from project' income. Royalty approach is considered promising because it allows to motivate donors financially. This method is often used to fund music projects, movies, when developing games. Examples are LookAtMyGame, SonicAngel and Slated. The disadvantage of this method is its lower competitiveness comparing to the previous two types of crowdfvesting.

Crowdfunding platforms marked consolidation is required. Industry estimates the number of platforms in existence today to 500 active but some quote 9000 different domain names related to crowdfunding. (Caldbeck, 2013) It is highly segmented market. Some of the platforms are very small and provide funding just to few

Table 1

**Typology of crowdfunding**

By country of origin of financial resources	National Foreign International	
By lifetime of the project	Short-term Medium-term Long-term	
By directions of investments	Entrepreneurship Social project Art, music and books Other projects	
By novelty	Innovative Modernizative Classic	
By information channels of project	Direct Indirect	
By way of regarding donors	With the gift remuneration	Without any remuneration
		With non-financial remuneration
	With financial remuneration or crowdfvesting	P-2-P lending
		Equity-based crowdfvesting
		Royalty-based crowdfvesting

Table 2

**Comparison of crowdfunding platforms**

Platform	Established	Fully funded projects	Commission, project funded	Regulations	Countries available	Success project
Kickstarter	2009	44%	5%	Strict guidelines what can be funded	US, Canada, UK, New Zealand, Austria, Netherland	6500+
Indiegogo	2007	9,3%	4%	Looser rules	Other 200 Countries	400
RocketHub	2010	7%	4%	Looser rules	Other 200 Countries	94

projects. It is especially true to local national platforms where crowdfunding is just opens up for the public. For example, Movation.no in Norway has innovation market 3in.no which helps to collect money to about 15 projects at the moment. On the other hand we have highly branded names like Kickstarter which at the moment has about 5000 projects live (Kickstarter Stats).

Venture creator seeking funding needs to select a platform to advertise and raise money on. Most popular donation based platforms operates today at different rules and statistics. Just to compare two, probably largest platforms:

Indiegogo unlike Kicstarter does not exercise the rule “All or nothing” but encourages project creators to collect all the money they have declared by charging higher commission. It also accepts projects that Kickstarter would not allowed like funding a couples newborn child, or children’s soccer team uniform. (Jeffries, 2013) Kickstarter have strict and detailed guidelines what type of project can be published on their website. As example, they recently declared, “creators cannot offer genetically modified organisms a reward” (Geere, 2013). Canonical, developing the high tear mobile phone Ubuntu Edge was seeking funding on Indiegogo because it covers so many countries. Kickstarter would not have allowed them to raise single donations above \$10 K as per their rules. The funding goal was set very high but still Canonical have managed to raise ample amount of money. \$8.3 Million was raised in just 2 weeks. (Jeffries, 2013) It can be argued which platform would be most successful in raising money for a particular project. New venture creators will have to cope with the platform rules and always evaluate which one will suit best. It can though be difficult because not all platforms are publishing statistics that would allow comparison. Indiegogo is keeping this information nonpublic so all estimations are done indirectly.

Crowdfunding falls into the broader category of collaborative consumption, defined as a “Peer-to-peer-based activity of obtaining, giving, or sharing the access to goods and services, coordinated through community-based online services” (Hamari, Sjöklint, & Ukkonen, 2015). The term was coined in 2007 through an article by Ray Algar as he was describing platforms like Wikipedia in which many people contribute towards the creation and collection of content for society (Algar, 2007). Crowdfunding itself was first mentioned in a 2006 blog-post in fundavlog (Sullivan, 2006).

Crowd-funding can be divided into four categories: social lending/donation crowd-funding, reward crowd-funding, peer-to-peer lending and equity crowd-funding. This is shown in Fig. 2.

Social lending/donation crowd-funding and reward crowd-funding are a way of fundraising for charitable causes, for example through angel investors, or pre-paying for a product from a business, for example NakedWines.com. These two categories of crowd-funding can be collectively referred to as “community crowd-funding” (see Figure 1). The main difference between these forms of crowd-funding and the other two that are the subject of this report is that they do not provide any financial return in the form of a yield or return on investment.

In RB crowdfunding, a company sets out rewards, like the finished product itself, to attract backers. By pledging a certain amount of money to the project, the backer will in turn be rewarded with the product/service once it is finished. The most notable RB platform at the moment is Kickstarter (Taylor, 2013). In 2014, 22,252 projects were successfully funded with US\$ 529 million in total (Kickstarter, 2015). As for the project raising the highest amount of funds so far, Star Citizen, a video game currently still in development has raised over US\$ 83 million to date in various

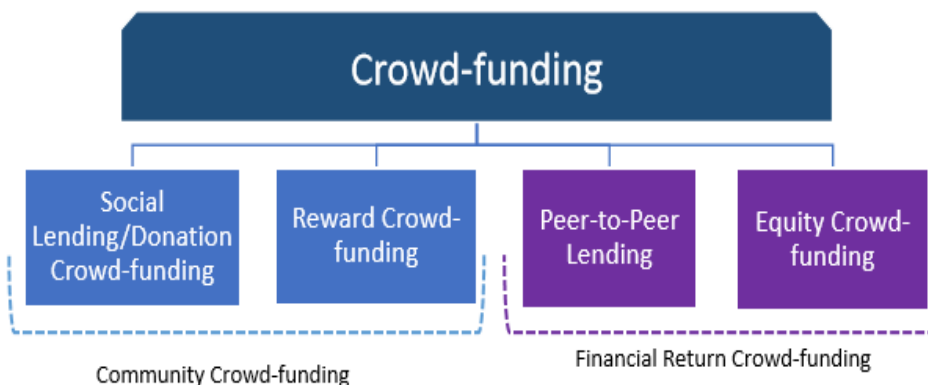


Fig. 2. The various forms of crowdfunding activities

campaigns since September 2012 (RSI, 2015). The Pebble is another example of a very successful RB crowdfunding project. Reward-based crowdfunding has experienced a 524% compound annual growth rate between 2009 and 2012 (The World Bank, 2013).

EB crowdfunding can be considered a more traditional investment approach whereby backers of projects receive shares of the respective company. This form of crowdfunding is less wide-spread due to current legal issues in several countries (Hemmilä, 2012). Nevertheless, as the popularity of crowdfunding grows, many countries have already brought forth legislation for making equity-based crowdfunding more accessible. However, in order to avoid pitfalls associated with current legal structures for several countries, of which many are prone to change in the near future, this research's scope will be limited to RB crowdfunding, specifically an extensive dataset harvested of every project from Kickstarter.

The potential of crowdfunding can be better understood by considering that the most crucial resource of a new business venture was found to be financing (Kortum & Lerner, 2000; Cosh, Cumming, & Hughes, 2009). The most prominent example of crowdfunding to date is the Pebble Smartwatch, a innovative high-tech smartwatch created by the startup venture Pebble Technology. While the company was able to raise US\$ 375,000 from angel investors, its founders were unable to find investors for an additional US\$ 100,000 required for the production of the finished product and therefore launched a Kickstarter campaign asking for the additional money (Milian, 2012). Within two hours of the 37 day long campaign, the goal was already reached, and when the campaign ended, US\$ 10,266,845 were collected from 68,928 people, 10,266% of the original goal. To date, the Pebble Smartwatch is the third most funded project on Kickstarter of all time, only bested by a futuristic cooler, and the Pebble Time, its successor, which was able to raise US\$ 20,388,986 (Kickstarter, 2015).

The concept of entrepreneurship has created discussion among economists for a long time already. Even the definition of entrepreneurship itself is so far not consistent. One of the most prominent definitions of entrepreneurs was set up by Alois Schumpeter, who defined an entrepreneur merely as an innovator, and not necessarily as the manager of said business (Schumpeter, 1934). And as Cunningham and Lischeron explain, the term has so far been used to explain "activities such as creation, founding, adopting,

and managing a venture" (Cunningham & Lischeron, 1991). In order to not be stuck within the debate of what an entrepreneur is and is not, this research will therefore adopt the basic concept that an entrepreneur is the creator of an innovative business. By choosing this definition, entrepreneurship can be represented in a broad and yet simple manner.

The field of entrepreneurs has not only gained more attention in the academic world, but also in every day life. A trend analysis of the word "entrepreneur" from search engine Google trends shows a clear increase in the interest of the term in past years. While initially having a search index ranking of 29-50, since 2009 however the term has experienced a near doubling of searches (Google, 2015). This could be interpreted as a rising interest in entrepreneurship by society.

As the research on crowdfunding and its relation to entrepreneurship is still in an early stage, empirical research on the field is scarce. Therefore this research will try to add to the few existing academic papers in the field in order to broaden researchers' understanding of the potential impact crowdfunding can have on high-tech startup companies.

Specifically, I will try to answer the question "Is crowdfunding a potential financing choice for new entrepreneurial high-tech ventures in the European Union and the United States of America?". In order to answer this question, first a literature review will be conducted which gives an in-depth understanding about current research in crowdfunding and new business-ventures. The purpose of this review is two-fold. Firstly, it will create a more in-depth understanding of prior and current research in the fields of crowdfunding and entrepreneurship. Secondly, it will aid in finding short-comings in the existing literature and create a guidance for this research paper. Afterwards, hypotheses which will aid to answer the research question will be established. Further, the data for this research paper will be introduced, and a methodology regarding the use of the data will be established. After this, the paper will provide an empirical analysis of the data with a comparison of high-tech ventures and non-high-tech ventures. This will allow me to draw a conclusion about the research and present insights for future researchers.

While the risks of crowdfunding certainly exist, it is important to understand that not only platforms themselves try to show credibility through manual review procedures (Kickstarter, 2015), but so do governments (European Commission, 2015).

Due to increasing attention towards crowdfunding by policy makers (Securities and Exchange Commission, 2012) as well as crowdfunding platforms to contain fraudulent behaviour, the biggest threat to a crowdfunder's reward seems to be mismanagement (Johnston, 2014).

**Conclusion.** In this article, we discussed when it makes sense for small high-tech entrepreneurial ventures to use crowdfunding rather than another source of finance. Some main characteristics of ventures emerged:

They need to raise a reasonably low amount of capital that would accommodate a relatively small number of investors. First because some legal forms have limitations in respect to that, and second because managing too big groups can prove to be difficult, even with new technologies. There are however a few cases that have shown how to circumvent many of these problems.

They have an interesting project to offer to prospects, in particular something innovative. Indeed, since crowdfunders are not only rent-seekers, they also need to be interested in the project, often ready to become an active investor in decision making.

They need to be willing to extend their skill set, or at least welcome other people's opinions. The reason for this is that, once again, crowdfunders seek projects where they can participate and be useful. This could be an advantage to anybody.

They need to know how to work the controls of Web 2.0, because the whole process goes through the interactive Internet, from communicating the project to managing shareholders. All of this could be done without the web, but at a considerably higher cost in time, money and efficiency.

Consequently, and mainly because of the first characteristic, crowdfunding is just adapted to small ventures. Bigger ones would be hindered with the cap in associates. Some companies have however circumvented this problem, like Trampoline Systems. Others adopt different organizational structures such as cooperatives or are based on membership. Moreover, not all small ventures can access it, only innovative ones that plan to grow big. Finally, big ventures might not be able to satisfy shareholders in their need for participation, so that excludes them too.

This paper has studied the emergence of a new kind of business funding, the crowdfunding. It has been argued that funding was particularly difficult to obtain for small businesses in respect of their size and lack of available historical data creating information asymmetry for potential investors. Hence, traditional financing methods like bank loans, business angels or VCs are out of reach for these small companies. Moreover, bootstrapping does not allow businesses to grow fast due to its focus on cash generation, often at the expense of maximizing value creation. As a result, crowdfunding can become a viable fundraising method obtainable for small entrepreneurial companies or project-based initiatives.

Our analysis of crowdfunding practices provides avenues for future research. One urgent question is the relation with intellectual property rights. Entrepreneurs making use of crowdfunding will need to disclose some of their ideas to the crowd well in advance, creating risks of idea stealing due to the fact that potentially valuable information is put into the public domain. Does this deter financially constrained entrepreneurs from tapping the crowd?

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