COMMUNICATION & SOCIETY

Juan-Salvador Victoria-Mas
https://orcid.org/0000-0002-1818-7438
jsvictoria@uma.es
Universidad de Málaga

Eva-María Ramos-Ábalos
https://orcid.org/0000-0001-6637-0141
ramosa@ugr.es
Universidad de Granada

José-Borja Arjona-Martín
https://orcid.org/0000-0003-3094-0020
jbarjona@ugr.es
Universidad de Granada

Crowdfunding in the production of video games in Spain: Evolution and success on Kickstarter

Abstract

This research addresses the use of crowdfunding platforms for the development of video games in Spain. It is part of the group of platform-centred research in order to develop a quantitative analysis of the data contained in them. Specifically, the data provided by Kickstarter for Spanish video game development projects is analysed. Normality tests indicated that the variables do not follow a normal distribution, hence non-parametric tests were used. The success rate of Spanish campaigns is 28.4% for the total number of cases, 40.8% in 2020, which is a steady growth since 2015. The average funding is €16,586.76, €50,056.67 for successful campaigns; however, the median indicates that 50% of the sample does not exceed €1,653 in funding. Regression models are used to develop equations to calculate the amount of funding needed to publish on PC and console, and the number of backers needed to achieve a given amount of funding.

Keywords
Crowdfunding, video games, development, independent video games, game industry.

1. Introduction

This study examines the development of video games in Spain through the use of crowdfunding. This modality offers an alternative means of financing for entrepreneurs through online networks, while simultaneously opening up a space for participation so that users can intervene in a decentralised way, collaboratively deciding which companies to finance or which projects to produce (Sánchez-González & Palomo-Torres, 2014).

However, the use and business of these platforms nuance this ideal and, in fact, respond to other objectives apart from the financial objective: market research (Paykacheva, 2014), promotion and advertising (Whitla, 2009), product development and even engagement with their target audience (Bielicki & Rydzewski, 2022). Therefore, as usually happens in our transmodern society (Rodríguez, 2004), this is a much more complex phenomenon than the theoretical and ideal starting point would make it seem.

Moreover, we must add to all this the original context of collaborative culture (Martín & López, 2012) and its implementation in the crowdfunding model (Bennett, Chin & Jones, 2015), both in its concept and in the way it conditions the creative roots of audio-visual productions in the different spheres of society and culture.

Contrary to the belief that crowdfunding is a last resort for entrepreneurs; it is often used as a first step in the search for funding, in addition to other contributions, such as from an interested publisher (sometimes after the campaign). Or it can also be a way of validating

Victoria-Mas, J. S., Ramos-Ábalos, E. M.ª & Arjona-Martín, J.-B.
Crowdfunding in the production of video games in Spain:
Evolution and success on Kickstarter

an idea or creating awareness and interaction about a company and its brand (Junge, Laursen & Nielsen, 2022).

Crowdfunding offers several models of participation based on what backers expect to achieve. One of the models would be financial participation, i.e., the backers have a share of the financial gains of the company. Another option would be that of those platforms that do not rely on financial compensation, but rather on altruistic or philanthropic motives (donations). Finally, other platforms focus on rewards based on products or services, especially of a creative and cultural nature (Kuppuswamy & Bayus, 2018). In this study, we look specifically at the model dedicated to cultural and creative products.

Underlying the influence of crowdfunding on the cultural and creative industries is the concept of indie as the basis for a change of balance, capable of circumventing the dominant structures in terms of funding models, work methods and creative processes.

In January 2022, Microsoft announced an acquisition deal of Activision Blizzard for 68.7 billion dollars (Microsoft News Center, 2022) and only a week earlier Take-Two Interactive announced the purchase of Zynga for 12.7 billion dollars (Forbes, 2022). These deals increase the concentration of the industry in large corporations, which reinforces the idea of rewards-based crowdfunding as a subversive route to the model imposed by what Fron *et al.* (2007) understand as the Hegemony of Play: a concept that exposes the negative effects of an exclusionary oligopolistic system on business practices, technology, gaming experiences and audiences. In other words, this hegemony promotes a homogenisation of culture that marginalises innovation, creativity and even a large part of the potential public (such as the elderly or women).

In response to this status quo, the concept of the crowdfunding ideology (Planells, 2015) emerges as an alternative to the traditional video game market as a space for innovation and opportunity for nascent companies, based on the democratisation of the means of production and distribution. However, as mentioned before, the uses of crowdfunding nuance these virtues, since the conventional market is introduced into crowdfunding by absorbing part of this independent production, appropriating its most characteristic elements to generate a line of indie products (Lipkin, 2013). In fact, the success of many of the indie games of recent years is due to their release by large publishers and platform owners such as Valve (Steam), Microsoft, Sony or Nintendo (De Jong, 2013). These digital marketplaces are conducive to the rise of products labelled as indie, partly related to the independent ideology that reflects a complex landscape that swings between opposition and integration–hegemony/subversion, capitalism/anti-capitalism, conservatism/progressivism (Pérez, 2016).

Digital distribution and mobile devices, which have been the main stimulus to the industry in recent years (Rayna & Striukova, 2014), combined with crowdfunding platforms, provide developers with the opportunity to appeal directly to the player as a means of funding. This would then enable a kind of negotiation between developers and users that could modify the initial objectives of the project (Smith, 2015); altering, at least in part, the traditional value chain, i.e., the relationships between developers, investors, editors, distributors and consumers (Nucciarelli *et al.*, 2017).

Platforms such as Kickstarter have been promoting a growing culture of independent production for more than a decade. Despite being a commercial company, this American platform is established as a Public Benefit Corporation, a definition that legally obliges it to consider the impact of its activity on society, and not only on its economic results and the reactions of its shareholders.

Kickstarter mainly employs rewards-based crowdfunding, in which users make a financial contribution in exchange for goods or services (Kraus *et al.*, 2016). With regard to video games, this exchange takes the form of the pre-sale of a digital or physical copy of the game, at least in most cases (Bradford, 2012).

Victoria-Mas, J. S., Ramos-Ábalos, E. M.ª & Arjona-Martín, J.-B.
Crowdfunding in the production of video games in Spain:
Evolution and success on Kickstarter

Thus, crowdfunding has developed a close link with independent production and niche markets, but it is also a good avenue of study for a large part of the Spanish industry in terms of its composition: 45% of production companies in Spain comprise a workforce of between 6 and 50 employees (DEV, 2022). Characteristics which partially define independent production, and refer to a context and specific methods of production and distribution as a defining feature of the indie, not limited to a particular style of game or aesthetic offering (Simon, 2013), as the big companies do by emulating the appearances and game mechanics. This, on the other hand, does not fail to give the concept of indie an important ideological significance that is perhaps not sufficiently considered (Crogan, 2018).

This paper offers a wide-ranging analysis of the Spanish crowdfunding initiatives for the development of video games following the concepts and success factors that are described below.

2. Theoretical background and state of the art

The concept of collaborative culture has been dealt with frequently from the fields of education and leadership in the sense of: "to become participant learners who contribute to a collective understanding of collaborative inquiry" (Emihovich & Battaglia, 2000). Therefore, this culture would not be able to develop itself without a context like shown by Edmonson *et al.* (2001): a framework that "provides a medium to fulfill three basic human needs in an organization: an element of control, meaning in a situation, and positive support. Although a top-down authoritative culture is obsolete nowadays, it remains the pervasive practice in today's schools" (Edmonson *et al.*, 2001). In the decade of gamification, our object of study could get from here the meaning in the base: video games give control, meaning and positive support to the participants not just in the game but in the proposal of the game from the very start. As stated by Aygoren and Koch (2021), crowdfunding prioritizes customer development above product development, which means that one of the most important goals of crowdfunding campaigns is to get feedback from the community (backers) during the development process. Actually, crowdfunding could be considered as a subcategory of the wider concept of crowdsourcing, which implies some level of interaction and collaboration between founders and users. According to Howe (2008) four major developments were needed to foster crowdsourcing as a consolidated environment: renaissance of amateurism, availability of the production resources, the extension of open-source software development basis and the emergence of communities focused on their shared interests. Von Hippel studied the concept of user-centered innovation as a general phenomenon fostered by the improving access to: "easy-to-use tools and components for innovation, and access to a steadily richer innovation commons" (2005, p. 75). It is a trend that could lead to a democratization of innovation, design and development that will require contributions from many sources. In this sense, Malone, Laubacher and Dellarocas (2009) studied what they called the *genome of collective intelligence*, which still serves as a model to analyze and design collective actions on the internet. They defined a specific *gene* named Crowd which could be "useful in situations where the resources and skills needed to perform an activity are distributed widely or reside in places that are not known in advance" (Malone, Laubacher & Dellarocas, 2009, p. 15). In these terms, the online community proves useful when a given activity can be divided into pieces that could be carried out by different people in a sort of cooperation project. In crowdfunding campaigns, those pieces would be the pledges that constitute the core element of the activity and the fundamental bond between founders and users-backers. Pledges (which will constitute the amount of money raised) are useful for research purposes since they not only serve as a way to measure the success of a crowdfunding campaign, but also can be a good way to study the relationship among a wide range of variables, which are somewhat related with user engagement (Sawhney, Verona & Prandelli, 2005).

Victoria-Mas, J. S., Ramos-Ábalos, E. M.ª & Arjona-Martín, J.-B.
Crowdfunding in the production of video games in Spain:
Evolution and success on Kickstarter

Micropatronage and crowdfunding are also concepts related to the marketing field as mentioned above. According to it, these activities mean at least three main aspects: "strategy, empowerment and micro, small and medium enterprises" (Wulandari & Arif, 2021). The field of study of collaborative video games projects in Spain would strictly follow this guide: they are strategic projects that seek empowerment from a micro background.

Thus, focusing on our object of study, Guillaud *et al.* (2013) compared the traditional video games industry with the changes promoted by crowdfunding platforms using the organizational ecology theory and the niche-width theory. From this approach, they studied, among others, two concepts that are relevant for our study: retention as "the apparition of the ripple effect through the emergence and retention of similar successful projects," and legitimacy, understood as the influence of "a pre-entry experience of developers in the video games industry, a convincing project's presentation and a strong effort in keeping its promise to the customer."

After all, crowdfunding represents an increasingly recurrent form of funding business and financial ventures. Venture financing through social networks has become a global phenomenon. Indeed, start-ups often face the challenge of a shortage of capital which could be overcome by raising small amounts of money from a large number of individuals. In this context the focus is now on reward-based crowdfunding campaign strategies and their communication tools dependent on the required *sales effort* and the *project added value*. The terms *communicator*, *networker* and *self-runner* are used for this crowdfunding strategy (Kraus *et al.*, 2016). In this sense there are a number of investigations analyzing success factors that allows entrepreneurs to extract best practice examples for increasing the probability of successful crowdfunding projects, and for that have been pointed out frequently similarities and distinctions from traditional venture finance. For instance, "project legitimacy" is especially important because online crowdfunding limits investors' access to the sponsored project: "lower funding targets and shorter duration signal legitimacy by setting modest, achievable expectations. Rewards structures, such as traditional equity investment terms, appear to generate a sense of legitimate investment returns. Finally, narrative legitimacy in the online crowdfunding context may derive more from the online platform community than the visual pitch" (Frydrych *et al.*, 2014).

Nonetheless, crowdfunding suffers from frequent cases of failure. To solve this some authors have proposed signaling theory (useful for describing behavior when two parties – individuals or organizations– have access to different information): "social ties, investment preparation and presentation, the supply of multiple rewards as well as endeavors to communicate and interact with the crowd positively influence the probability of success of a reward-based crowdfunding campaign. In contrast, the funding goal, a campaign's runtime and the estimated time of delivery for the rewards have a negative impact on the successful completion of a campaign" (Kunz *et al.*, 2017). Our research will try to provide deeper insight into these kinds of success factors.

3. Research objectives

The main aim of this research has to do with the demonstration of the hypothesis: "Collaborative culture also in Spain is more than a short-term trend mainly in such a paradigmatic postmodern industry as video games are." In order to do it, the following 3 main objectives are proposed:

O1. To measure the general behaviour of Spanish crowdfunding campaigns.
O2. To measure the success rate of Spanish campaigns from 2015 to 2020.
O3. To confirm crowdfunding platforms as a valid venue to study the independent development of video games.

Victoria-Mas, J. S., Ramos-Ábalos, E. M.ª & Arjona-Martín, J.-B.
Crowdfunding in the production of video games in Spain:
Evolution and success on Kickstarter

4. Material and methods

This study is integrated into the group of platform-focused research to develop a quantitative analysis of the data contained in such platforms, through manual coding processes (Stasik & Wilczyńska, 2018, p. 58). This methodological approach, while limiting the study sample by the requirement of manual data processing, makes it possible to study a wide and diverse number of variables. This aspect is fundamental for this study, as its main objective is to analyse the behaviour of Spanish projects for the development of video games through crowdfunding. It is therefore essential to define an approach capable of studying multiple aspects related to the characteristics of the campaigns and their performance on the platform.

We studied the data provided by Kickstarter, a platform dedicated to the development of creative projects, and one of the main platforms for funding video games. For the sample composition of campaigns based in Spain, the keywords "video games" and "videojuegos" were searched within the "games" category.

A total of 494 campaigns were found, from which the following projects were excluded: those not completed during the data collection period (throughout the month of May 2021), those cancelled before the completion date and lastly those whose target was to develop a related product (books, hardware or short films) rather than an actual videogame. Thus, a final sample of 303 campaigns was selected.

Three types of variables were defined for the analysis: a) categorical, which determine the location of the campaign; b) dichotomous, which establish whether or not the cases belong to a category; and c) quantitative, which collect numerical information about the campaigns. The following table details the variables under study:

Victoria-Mas, J. S., Ramos-Ábalos, E. M.ª & Arjona-Martín, J.-B.
Crowdfunding in the production of video games in Spain:
Evolution and success on Kickstarter

Table 1. Description of variables.

Variable	Description	Type of variable
City	Location of the campaign	Categorical
Year	Year of completion of the campaign	Quantitative
Goal	Amount for funding the project. Established at the beginning of the campaign	Quantitative
Funding	Amount of money raised at the end of the campaign.	Quantitative
Backers	Total number of backers contributing financially	Quantitative
First-time Backers	Number of users who have contributed for the first time in a campaign	Quantitative
Repeat Backers	Number of users who have funded more than one project	Quantitative
Backer origin	Number of backers according to the country of origin	Quantitative
Campaign period	Duration of the campaign	Quantitative
Team members	Number of people on the video game development team	Quantitative
Campaigns per creator	Number of campaigns promoted by each entrepreneur	Quantitative
Goal met	The campaign meets or exceeds the funding goal	Dichotomous
Published on console	The video game is published on the home console market after the end of the campaign	Dichotomous
Published on PC	The video game is published on the PC market after the end of the campaign	Dichotomous
Genres	23 non-exclusive genres were assigned to define the game offerings (action, role-playing, platformers, first-person shooter, etc.), the graphical and aesthetic aspects (2D, 3D or pixelated graphics) and designs for mobile devices and virtual or augmented reality systems.	Dichotomous

Source: Own elaboration.

The analysis tries to obtain the maximum information from the different variables that are part of the study, providing different statistical models that give optimal adjustments in the relationship between all those different variables. In other words, a general picture of Spanish campaigns performance is provided. Thus, there are no specific objectives on a variable, so this research aims to provide different models able to generate significant information.

Normality tests indicated that the variables do not follow a normal distribution, therefore non-parametric tests were used and structured in accordance with the following objectives:
1. General characterisation of the data.
2. Independent study to measure relationships between dichotomous variables.
3. Analysis according to the year of the end of the campaign.
4. Comparative analysis between quantitative and dichotomous variables (except for genres).
5. Frequency analysis of genres.

Victoria-Mas, J. S., Ramos-Ábalos, E. M.ª & Arjona-Martín, J.-B.
Crowdfunding in the production of video games in Spain:
Evolution and success on Kickstarter

6. Analysis of the variables –City (grouped by Autonomous Community) and origin of backers (grouped by region). In addition, trends in genres were analysed according to the origin of the backers.
7. Development of a logistic regression model to estimate the influence of the variables - Funding and Goal met on the probability of publishing the games, and a linear regression model to explain the influence of the variables - Backers, First-time and Repeat Backers on funding. Logistic regression is useful for cases where the objective is to predict the presence or absence of a feature or outcome based on the values of a set of predictors. It is similar to a linear regression model but adapted for models in which the dependent variable is dichotomous. In this research, the Published-on console variable is dichotomous, that is, it takes the value 1 if the game is published on console and the value 0 otherwise.

5. Results

5.1. *General descriptive analysis*

Of the total number of Spanish Kickstarter campaigns (N=303), 28.4% (N=86). An average of 22,977.82€ (10,000 median) was requested for the total number of cases, and 16,586.76€ (1,653 median) was raised (see Annex 1). With a confidence of 95%, it can be said that the average funding is between €10,543.73 and €22,629.78 and the goal is between €19,382.60 and €26,573.05.

An average of 463.7 backers is reported, of which 103.99 are first-time backers and 360.02 repeat backers. The average range is between 463.77 and 80.030 (confidence interval of 95%). 50% of the campaigns have a number of backers equal to or less than 48 and a maximum of 11,716.

We can state that the average number of first-time backers is between 57.4 and 150.63, while the average number of repeat backers is between 240.88 and 479.16. These data refer to confidence intervals that allow us to extrapolate information to the entire population using data from a sample. In this specific case, it can be stated, with a confidence interval of 95%, that the true value of the average number of first-time backers and repeat backers, in the entire population, is between 57.4 y 150.63 and 240.88 and 479.16 respectively. The same interpretation is applied to the rest of the intervals.

If we isolate the projects that meet their funding goal (N=86), the average number of backers is 1,408.79. The average number of backers for successful campaigns is between 903.08 and 1,914.5, with a median of 468 backers. On average, each backer contributes €34.5 per campaign (median €26.72).

To analyse the relationship between repeat and first-time backers, a Wilcoxon test was carried out, the result of which confirms the greater influence of repeat backers. There was also a greater influence on the level of funding when contrasting this variable with the two types of backers: significant correlation in both cases, but higher in repeat backers ($rs = 0.924$, $p<0.01$) (see Annexes 2 and 3).

For their part, development teams are made up of 3.78 people on average. However, half of the projects are driven by 2 or fewer members. It can be said that the average number of team members is between 3.3 and 4.25 people. However, 34.7% of the samples are made up of single-member campaigns.

The average number of campaigns per creator is 1.53, with an average duration of 34.21 days. Most frequently, there is only one campaign per creator, which is the case in 70.6% of the cases.

We observe that, regardless of whether they meet their funding goal, 40.9% (N=124) of the projects end up on the PC market; 17.8% (N=54) on console and 15.5% (N=47) on both platforms.

Victoria-Mas, J. S., Ramos-Ábalos, E. M.ª & Arjona-Martín, J.-B.
**Crowdfunding in the production of video games in Spain:
Evolution and success on Kickstarter**

Of note are the 16.5% (N=50) of the campaigns that do not meet the funding goal but manage to publish the game on PC, and the 4.3% (N=13) that, despite not meeting the goal, publish on console (see Annex 4).

5.2. *Study of independence of dichotomous variables*

A chi-square test was conducted and it revealed a positive association (p<0.000) between meeting the funding goal and publishing the game on PC and console (see Annex 5). 67.3% (N=204) of the sample do not meet the funding goal and do not publish the game on console, compared to 13.5% (N=41) who meet the goal and publish on console. An advantage ratio of θ=14.297 is obtained, indicating that the probability of releasing the game on console is 14 times higher for projects that meet the goal.

Regarding PC, 55.1% (N=167) do not meet the goal and do not release their games on PC. 24.4% (N=74) meet the goal and release on PC. For PC, the probability of releasing the game amounts to 20.597 when they meet the goal.

However, there are cases where, despite meeting the goal, the games do not reach the market. There are 12 campaigns of this type (4%) in which the money raised will be returned to the backers.

Finally, when comparing the cases that are published on PC and on console, the correlation is also positive. That is to say, the advantage quotient indicates that the probability of releasing the game on console is 15 times higher in those projects published on PC. 15.5% (N=47) of the cases are published on both platforms, compared to 56.8% (N=172) that do not reach any market.

5.3. *Study by year of completion of the campaign*

There is an upward trend, since 2015, in the number of campaigns meeting the goal, with 2020 being the most prolific year with 40.8% of successful campaigns. In 2018 there is a slight decrease, which rises again in 2019 and continues this trend in 2020.
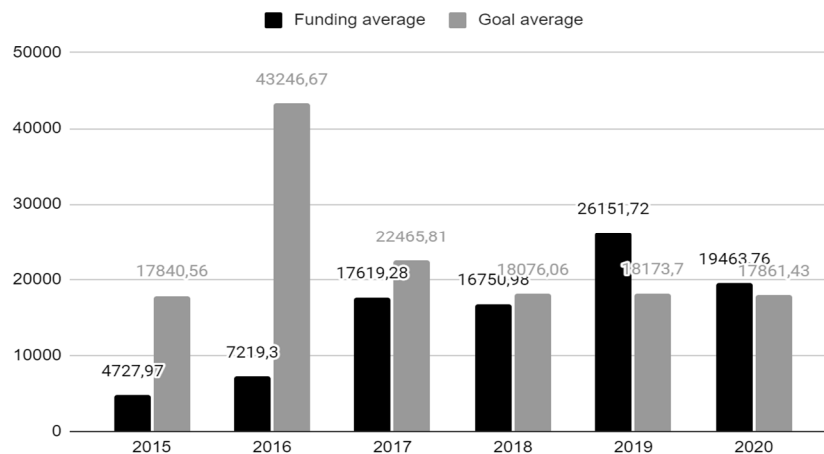
Figure 1. Campaigns meeting the funding goal by year.
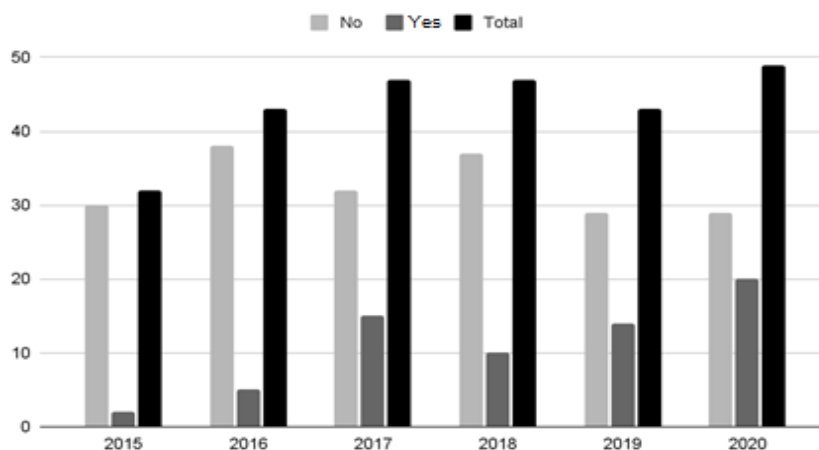
Source: Own elaboration.

To study the variables Funding and Goal according to the year in which the campaign ended, we used the Kruskal–Wallis rank test. The test indicates that there are significant differences (see Annex 6), but to check between which years they occur we compare the years two by two using the Mann-Whitney test. There is a significant difference, at 5%, in 2020 with 2016 and 2018 with respect to funding, with a higher average in 2020. Another significant difference is present in the goal in 2016 if compared to 2017, 2018 and 2020.

Victoria-Mas, J. S., Ramos-Ábalos, E. M.ª & Arjona-Martín, J.-B.
Crowdfunding in the production of video games in Spain:
Evolution and success on Kickstarter

Figure 2. Average of funding and goal by year.

Source: Own elaboration.

Average funding grows until 2019, decreasing in 2020 by €6,687.96. However, as mentioned earlier, there is a statistically significant growth when comparing 2020 with 2016. With respect to the goal, there is a notable decrease in 2017 (20,780.86 less than in 2016), although from that year onwards it remains at the same level.

5.4. *Comparative analysis*

For the contrast between dichotomous and quantitative variables, we used the Mann–Whitney test, indicating that there are significant differences between goal met and funding, backers, team members, campaigns per creator and average contribution per backer, with higher values in the campaigns that meet the goal (see Annex 7).

The average funding for successful campaigns is €50,057 with a goal of €18,909 and 1,408 backers. The number of team members in these campaigns is higher than the general average (5.9 to 3.7) and a large percentage (86%) reach the PC market and 47.6% reach the console market.

Table 2. Averages according to funding goal.

Goal met		Funding	Goal	Backers	Team members	Repeat Backers	First-time Backers
NO	Average	3322.18	24590.42	89.25	3.14	69.15	19.12
	Number	217	217	217	217	216	217
	Deviation	6675.843	33966.391	165.771	3.379	145.750	40.683
YES	Average	50056.67	18908.81	1408.79	5.37	1090.58	318.14
	Number	86	86	86	86	86	86
	Deviation	91957.796	25261.808	2358.721	5.410	1763.907	732.053
Total	Average	16586.76	22977.82	463.77	3.78	360.02	103.99
	Number	303	303	303	303	302	303
	Deviation	53454.433	31802.073	1393.076	4.174	1052.143	412.617

Source: Own elaboration.

Victoria-Mas, J. S., Ramos-Ábalos, E. M.ª & Arjona-Martín, J.-B.
Crowdfunding in the production of video games in Spain:
Evolution and success on Kickstarter

There are also significant differences between published and unpublished games (PC, console or PC/console). The latter refers to those video games that were not launched in any market (console or PC) whether or not they met their funding goal. The mean values are higher in all variables for published games, except in Goal for PC. That is, for PC the goals are similar in both situations (published and unpublished) with values of 23,342 and 22,651 respectively.

Isolating results by platform, games published only on PC obtain a funding of €20,599 (Goal = €21,919); for games published only on console it is €26,079 (Goal = €25,486) and those published on both reach €58,146 (Goal = €25,704).

There are significant differences in all variables except Funding period when comparing campaigns driven by a single individual (34.7%) with those driven by teams. The average values are higher in projects developed by teams, except for the number of campaigns per creator, which is higher in individual campaigns.

The average funding for individual projects is €3,002 (Goal = 10,635) compared to €25,367 (Goal = 30,902) for team campaigns. The difference in goal achievement is also significant: 17.1% (individual) and 33.5% (team). Finally, 25.7% of individuals publish on PC (Teams, 51.4%) and only 6.6% on console (Teams, 24%).

5.5. *Results according to genres*

For the total number of campaigns, the most popular genres (data expressed as percentages), according to their gameplay and game mechanics, are: "Action Combat" (41.6%), "Platformers" (26.7%), "Multiplayer/Co-Op online" (23.4%), "RPG" (21.1%) and "Puzzle" (21.1%) (see Annex 8). The least popular are "Fighting" (1.7%), "Educational" (2.3%), "FPS" (First Person Shooter, 3.3%), "Visual Novel" (3.6%), "Sport/Racing" (4%) and "Virtual Reality/Augmented Reality" (5.6%).

In terms of graphics, 2D games are more common (52.2%) –mainly linked to the "pixel art" style (27.4%)– than 3D games (50.5%). However, in successful campaigns 2D games increase to 65.1%, with pixel art style accounting for 33.7%.

For successful campaigns, genres involving, in particular, action gameplay elements reduce their inclusion ("Action Combat", 36%; "Shoot em Up," 2.3%; FPS, 2.3% and "Fighting," 1.2%) to the benefit of role-playing (RPG, 27.9%), platformers (30.2%), puzzles (23.3%) and, especially, graphic adventures ("Graphic Adventure," 16.3%) and visual novels ("Visual Novel," 11.6%). It should be noted that the genres are not mutually exclusive, and therefore tend to be combined in more or less complex and diverse offerings.

Likewise, strategy and management ("Strategy/Tactic/Managing, 17.4%), horror (16.3%) and multiplayer (15.1%) are significant genres for successful campaigns. In contrast, education (0%), sports (1.2%), fighting (1.2%) or FPS (2.3%) are insignificant.

For games published on PC (N=124), the above preferences are replicated ("Action combat," 41.9%; "RPG," 24.2%; "Platformers," 24.2%; "Multiplayer/Co-Op online," 23.4%; "Puzzle" 20.2% and 2D 54.8%) although strategy and management games (15.3%) also form a significant percentage.

The trend is also repeated with respect to less popular genres: there are no cases of educational games and fighting games and FPS are included in 1.6%.

With regard to games published on consoles (N=54), action games increase ("Action Combat" 44.4% and "Beat em Up/Hack and slash" 16.7%), although the greatest increase is in platform games (38.9%). And if we analyse the games published on both platforms (N=47), action increases to 80.7%, registering the most relevant growth.

There is therefore a clear inclination towards action-based offerings (fighting, combat, and shooting): 61.8% (total), 64.5% (PC), 72.3% (console) and 80.7% (PC/console).

5.6. *Analysis according to Autonomous Community of Spain and origin of the backers*

Most projects arise in the Autonomous Communities of Madrid (25.1%), Catalonia (24.4%), Andalusia (18.5%) and Valencia (12.2%), accounting for 80.2%. The Community of Madrid and

Victoria-Mas, J. S., Ramos-Ábalos, E. M.ª & Arjona-Martín, J.-B.
Crowdfunding in the production of video games in Spain:
Evolution and success on Kickstarter

Catalonia account for half of the cases (49.5%) (see Annex 9). When comparing this group with the rest of the Autonomous Communities through the Mann-Whitney test, there is no significant difference in any of the variables.

A study of the data of the backers records 63 nationalities. The United States (59,393 backers/Average=196.02), Spain (19,680/Average=64.95), the United Kingdom (10,376/Average=34.24), Canada (7,257/Average=23.95) and Germany (6,676/Average=22.03) stand out.

If we group the nations by continent, we see that North America (66,650 backers/Average=219.16) and Europe (46,746/Average=154.27) account for almost all the backers (94.8%). From Oceania there were 4,666 backers (mean=15.39; 3.9%); Asia 935 (mean=3.08; 0.8%) and Central and South America 611 (mean=2.01; 0.5%).

As for the main genres, the differences between North America and Europe are minimal: "Action Combat" (44.3%/44.2%, respectively), "Platformers" (28.7%/28.8%), "RPG" (26.1%/25.8%), "Puzzle" (21.7%/22.3%), "2D" (54.3%/54.9%) and "3D" (48.7%/48.1%).

We observe further differences when contrasting these two regions with the rest. In Asia, action elements are reduced (43%) in favour of role-playing (30.8%). In addition, there is a greater inclination towards "pixel art" (35.5%).

In Oceania, action (41.8%) is followed by platformers (31.5%) and puzzles (26%), with the latter two increasing compared to North America and Europe. And the difference between 2D and 3D games is wider (58.9% and 45.2%, respectively).

In Central and South America, role-playing elements decreased (21.5%) and action (50.8%), platformers (46.2%) and puzzles (30.8%) increased. These figures, added to the 61.5% for 2D games, show a greater inclination in these countries towards more conventional action games combined with platformers and puzzles.

5.7. *Logistic and linear regression models*

For the logistic regression model, we define Published on console as the dependent variable and as independent variables Funding and Goal met (see Annex 10). With the Hosmer-Lemeshow test, the model is acceptable (0.233>0.05) and explains 34.2% of the variability from the Nagelkerke R-squared value, considering the predictor variables (Funding and Goal met).

The p-value for Funding is statistically significant (0.087<0.1) at 10%. The value of the parameter Exp(B) (ODDS) is 1.000006 (>0) very close to 1, indicating that the variable Funding influences the model positively, so that the higher the funding, the higher the probability of publishing the game on console. As funding increases by one unit, this probability increases by 1.000006%.

The p-value associated with Goal Met is significant (0.000<0.05), and the value of Exp(B) = 11.178 (>0) indicates that the probability of the game ending up on console increases by 11.178% if the goal is met, for an equal value of funding.

With these data we develop the logistic regression equation, which serves to predict the probability that the game ends up on console according to Funding and Goal met:

$$P(CONSOLE = YES) = \frac{1}{1 + exp\,(2.773 - 0,000006xFunding - 2.214xGoal\,met)}$$

Including Published in PC as a dependent variable, we obtain a reliable logistic model (0.053>0.05), explaining 41.8% of the variability. The p-value of Funding is significant (0.068<0.1) at 10% and Exp(B) is 1.000024 (>0), i.e., funding has a positive influence: the more the funding, the greater the probability of publishing on PC. As funding increases by one unit, the probability increases by 1.000024%.

The p-value in Goal Met is significant (0.000<0.05) and Exp(B)=12.476 (>0) indicates that the probability of publishing in PC increases by 12.476% if the goal is met, for an equal value of funding. Thus, we get the following equation:

Victoria-Mas, J. S., Ramos-Ábalos, E. M.ª & Arjona-Martín, J.-B.
Crowdfunding in the production of video games in Spain:
Evolution and success on Kickstarter

$$P(PC = YES) = \frac{1}{1 + exp\ exp\ (1,292 - 0.000024xFunding - 2,524xGoal\ met)}$$

Goal met being the dependent variable and the independent variables Funding and genres, we found that only "Graphic Adventure," "Visual Novel" and "Pixel Art" are relevant, so the regression is performed with these three genres.

The p-value associated with the genres, as explanatory variables, is statistically significant ("Graphic Adventure," 0.009<0.05; "Visual Novel," 0.000<0.05; "Pixel Art," 0.007<0.05). The value of Exp(B) indicates that in all three cases the probability of meeting the funding goal increases: Graphic Adventure, Exp(B) = 4,013 (>1); Visual Novel, Exp(B) = 52.243 (>1); Pixel Art, Exp(B) = 2,736 (>1). Therefore, the following equation determines the probability of the goal being met based on funding and whether the game contains these three genres:

$$P(GOAL = YES)$$
$$= \frac{1}{1 + exp\ (2,683 - 0.000114xFunding - 1,389xGraphicAdventure - 3,956xVisual\_novel - 1,007xPixel\_Art)}$$

Finally, we developed three linear regression models taking Funding as the dependent variable and backers, repeat backers and first-time backers as independent variables (see Annex 11). With backers, the R-squared value is 0.889, so that the variable Funding can be explained by the number of backers (N_backers) with 88.9% reliability, obtaining a high linear correlation coefficient (0.943). The resulting regression equation is:

$$Funding = -194.461 + 36.184 * N\_Backers$$

According to repeat and first-time backers, the R-squared value indicates that with 82.4% and 76.3% reliability, respectively, variable Funding could be explained by a given number of backers. The correlation coefficients are positive in both groups.

$$Funding = 16.565 + 46.178 * N\_Repeat\ backers$$

$$Funding = 4818.688 + 113.169 * N\_First\text{-}time\ backers$$

6. Discussion and conclusions

The success rate of Spanish campaigns stands at 28.4% for the total number of cases, 40.8% for campaigns completed in 2020. This represents an upward trend since 2015. The median funding is €16,586.76 (€50,056.67 for successful campaigns) and is below the goal in all years except 2019. However, the median indicates that half of the samples do not exceed €1,653 in funding. We cannot establish a correlation between the funding goal and its achievement. That is, we cannot determine whether the amount requested at the start of the campaign can influence users' confidence in the project and the team (or individual) proposing it.

Before determining the statistical models shown in this paper, it has been verified that variables for which we have information can be influential in the model. To do this, they have been introduced into the equations and the goodness of fit has been verified, concluding that the variables considered here are the ones that best explain the behavior of the dependent variables.

In the evaluation of the results for the total sample, the campaigns promoted by a single individual have a significant impact. Their lower success rate and low level of funding confirms the findings of other studies (Cha, 2017) that team-driven campaigns are more likely to be successful.

Victoria-Mas, J. S., Ramos-Ábalos, E. M.ª & Arjona-Martín, J.-B.
Crowdfunding in the production of video games in Spain:
Evolution and success on Kickstarter

Likewise, Cha and other authors (Gallemore, Nielsen & Jespersen, 2019), extending their studies to all types of projects, not necessarily cultural, indicate that geography could influence the likelihood of a campaign's success. This is not the case in this study as there is no correlation between meeting the funding goal and the city where the campaign is located. This finding is in line with other studies that show how crowdfunding reduces geographical constraints (Agrawal, Catalini & Goldfarb, 2011), which, in contrast, are decisive in conventional (physical) environments. This circumstance is probably due to the nature of the video game, which, understood as a cultural object, is particular as it constitutes a much more globalised content. For historical reasons, and because of its digital nature (and globalisation in the late 70s and early 80s), the codes that extend and "regulate" it are more or less common in all regions. What we can confirm, however, is the high polarisation of crowdfunding in Spain, where 49.5% are promoted in Madrid and Catalonia, in line with other studies that confirm the high concentration of campaigns in a few urban centres (Mollick, 2014).

The correlation between meeting the goal and publishing the game confirms the existence of, in general, a non–simultaneous two-step process: first, marketing on PC, second, adapting the game for console. The chances of releasing the game on console increase by 15-fold when the game has been released on PC beforehand. While these two stages can overlap as a simultaneous release in both the markets, it only occurs in a few cases. We see that the promise of releasing a game on console is a pull factor and boosts funding levels.

On the other hand, 16.5% of the campaigns are published on PC despite not meeting their goal, which can be explained by the fact that it is a more accessible market, both technically and financially. The console, on the other hand, requires higher costs, hence the difference in average funding between games published on console and PC.

We highlight the average number of members that make up a Spanish campaign (3.78) as it is close to the data provided by the DEV study (2022), indicating that half of the Spanish companies are made up of less than 5 people. According to this report, crowdfunding is a growing resource in recent years. This is confirmed by the growing trend since 2015 in both, the number of campaigns created and their success rate.

The study by genres reveals a redundant offer in game styles and visual aspects typical of past decades. The direct allusion to nostalgia continues to be an important trend in independent video games. While some studies (Chen, Thomas & Kohli, 2016) found no correlation between nostalgia and the amount of money raised as funds (these are not studies focused solely on video games), it seems that the emotions unleashed by nostalgia are an effective instrument of persuasion (Gilbert, 2017). In fact, our results show that adventure games and pixel art increase the likelihood of meeting the funding goal. We deduce that there is a wide audience for these types of offerings, which are, in addition, more economical for small developers.

Action games are predominant, especially in campaigns that meet the goal. However, there is a high degree of intermingling in which action is combined with elements of mainly role-playing, platforming and puzzle. Gameplay, thematic and narrative schemes typical of traditional markets are replicated, but no offerings from other genres, such as sports games, or campaigns linked to online play such as massive multiplayer games, were found. The presence of games for mobile devices is minimal, although it is the main development market in Spain, along with the PC.

The origin of the backers seems to be conditioned by the nationality of Kickstarter (55.7% are located in the United States), which is suggested by the minimal presence of backers from Latin American countries despite the cultural ties that link them to Spain.

There is a greater share of repeat backers in funding. This group represents an audience that makes a more intensive use of crowdfunding platforms and, probably, a type of frequent user of video games. The lower share of first-time backers may be due to the fact that they

Victoria-Mas, J. S., Ramos-Ábalos, E. M.ª & Arjona-Martín, J.-B.
Crowdfunding in the production of video games in Spain:
Evolution and success on Kickstarter

generally come from circles close to the campaign promoters, the so-called "family and friends" (Agrawal *et al.*, 2015).

Following studies such as Zhang and Chen (2019), in which they establish a correlation between the number of backers and the probability of success of campaigns, the linear regression equations developed in our analysis will help to estimate, with a high level of reliability, the number of backers needed to raise a given amount of funding. On the other hand, logistic regression models provide equations that will help creators determine what amounts of funding they would need to publish on PC and console.

The data collected for this study confirmed retention (Guillaud *et al.*, 2013) since successful campaigns grew significantly during the period studied. As Guillaud *et al.* also confirmed, crowdfunding satisfies certain demands from players that traditional industry tends to ignore. For this reason, we consider crowdfunding as a valid medium for the analysis of an important part of cultural production, which becomes especially useful for projects or companies in their early stages of development. However, in line with the conclusions reached by other studies (Cordova *et al.*, 2015), a complete understanding of the factors involved in the various crowdfunding processes will require other sources of data and other methodological approaches, such as complementary qualitative techniques. Actually, other studies (Aygoren & Koch, 2021) underline the impact of crowdfunding dynamics outside the online dimension (for instance, in the actual market) revealing some of the issues raised by the platform-focused approach.

References

Agrawal, A. K., Catalini, C. & Goldfarb, A. (2011). The geography of crowdfunding. *NET Institute Working Paper*, No. 10-08. https://www.doi.org/10.2139/ssrn.1692661

Agrawal, A., Catalini, C. & Goldfarb, A. (2015). Crowdfunding: Geography, Social Networks, and the Timing of Investment Decisions. *Journal of Economics and Management Strategy, 24*(2), 253-274. https://www.doi.org/10.1111/jems.12093

Aygoren, O. & Koch, S. (2021). Community Support or Funding Amount: Actual Contribution of Reward-Based Crowdfunding to Market Success of Video Game Projects on Kickstarter. *Sustainability*, *13*, 9195. https://www.doi.org/ 10.3390/su13169195

Bielicki, M. & Rydzewski, R. (2022). How to create an engagement-friendly environment in reward-based crowdfunding? *Central European Economic Journal*, *9*(56), 38-55. https://www.doi.org/10.2478/ceej-2022-0003

Bradford, C. (2012). Crowdfunding and the Federal Securities Laws. *Columbia Business Law Review*, *1*, 1-150. Retrieved from https://bit.ly/3kG3uHB

Cha, J. (2017). Crowdfunding for Video Games: Factors that Influence the Success of and Capital Pledged for Campaigns. *International Journal on Media Management, 19*(3), 240-259. https://www.doi.org/10.1080/14241277.2017.1331236

Chen, S., Thomas, S. & Kohli, C. (2016). What really makes a promotional campaign succeed on a crowdfunding platform?: Guilt, utilitarian products, emotional messaging, and fewer but meaningful rewards drive donations. *Journal of Advertising Research, 56*(1), 81-94. https://www.doi.org/10.2501/JAR-2016-002

Cordova, A., Dolci, J. & Gianfrate, G. (2015). The determinants of crowdfunding success: evidence from technology projects. *Procedia, Social and Behavioral Sciences, 181*, 115–124. https://www.doi.org/10.1016/j.sbspro.2015.04.872

Crogan, P. (2018). Indie dreams: Video games, creative economy, and the hyperindustrial epoch. *Games and Culture, 13*(7), 671-689. https://www.doi.org/10.1177/1555412018756708

Victoria-Mas, J. S., Ramos-Ábalos, E. M.ª & Arjona-Martín, J.-B.
Crowdfunding in the production of video games in Spain:
Evolution and success on Kickstarter

De Jong, J. (2013). *Indie issues: The meaning of 'Indie' games and their incorporation into the 'Mainstream' game industry*. Master Thesis, University of Amsterdam. UvA-DARE. Retrieved from https://bit.ly/2YukaYu

DEV (2022). *Libro blanco del desarrollo español de videojuegos 2021* [White paper]. Retrieved from https://bit.ly/3l99nxc

Edmonson, S., Fisher, A., Brown, G., Irby, B., Lunenburg, F., Creighton, T., Czaja, M., Merchant, J., Christianson, J. & Christianson, J. (2001). Creating a Collaborative Culture. *National Council of Professors of Educational Administration 55th Annual Summer Conference*. Houston (Texas). Retrieved from https://bit.ly/3lwXfKq

Emihovich, C. & Battaglia, C. (2000). Creating cultures for collaborative inquiry: New challenges for school leaders. *International journal of leadership in education*, *3*(3), 225-238.

Forbes (January 10, 2022). Take-Two Interactive To Acquire Zynga. Retrieved from https://bit.ly/3mqgq50

Fron J., Fullerton T., Morie J. F. & Pearce, C. (2007). The hegemony of play. *Proceedings, DiGRA: Situated Play*, 1-10. Retrieved from https://bit.ly/3FlVIfB

Frydrych, D., Bock, A. J., Kinder, T. & Koeck, B. (2014). Exploring entrepreneurial legitimacy in reward-based crowdfunding. *Venture capital*, *16*(3), 247-269.

Gallemore, C., Nielsen, K. R. & Jespersen, K. (2019). The uneven geography of crowdfunding success: Spatial capital on Indiegogo. *Environment and Planning A: Economy and Space*, *51*(6), 1389-1406. https://www.doi.org/10.1177/0308518X19843925

Gilbert, A. S. (2017). Crowdfunding Nostalgia: Kickstarter and the Revival of Classic PC Game Genres. *The Computer Games Journal, 6*(1), 17-32. https://www.doi.org/10.1007/s40869-017-0031-x

Guillaud, R., Hänninen, R., Mariot, P. & Perret, E. (2013). Crowdfunding and the video-games industry. In M. Peltoniemi (Ed.), *Industry Evolution, Empirical Studies on Discontinuities* (pp. 99-118). Otaniemi: Aalto University.

Howe, J. (2008). *Crowdsourcing: How the power of the crowd is driving the future of business*. New York: Random House.

Junge, L. B., Laursen, I. C. & Nielsen, K. R. (2022). Choosing crowdfunding: Why do entrepreneurs choose to engage in crowdfunding? *Technovation*, *111*, 1-10. https://www.doi.org/10.1016/j.technovation.2021.102385

Kraus, S., Richter, C., Brem, A., Cheng, C. F. & Chang, M. L. (2016). Strategies for reward-based crowdfunding campaigns. *Journal of Innovation & Knowledge, 1*(1), 13-23. https://www.doi.org/10.1016/j.jik.2016.01.010

Kunz, M. M., Bretschneider, U., Erler, M. & Leimeister, J. M. (2017). An empirical investigation of signaling in reward-based crowdfunding. *Electronic Commerce Research*, *17*, 425-461.

Kuppuswamy, V. & Bayus, B. L. (2018). Crowdfunding Creative Ideas: The Dynamics of Project Backers. In D. Cumming & L. Hornuf (Eds.), *The Economics of Crowdfunding* (pp. 151-182). Cham: Palgrave Macmillan. https://www.doi.org/10.1007/978-3-319-66119-3_8

Lipkin, N. (2013). Examining Indie's independence: The meaning of "indie" games, the politics of production, and mainstream co-optation. *Loading, 7*(11), 8-24. Retrieved from https://bit.ly/39tcOfG

Malone, T., Laubacher R. & Dellarocas, C. (2009): Harnessing Crowds: Mapping the Genome of Collective Intelligence. Cambridge: MIT Center for Collective Intelligence Massachusetts Institute of Technology. Retrieved from https://bit.ly/42tYWJn

Martín-Sánchez, M. A. & López-Meneses, E. (2012). Information society and teacher training. e-activities and collaborative learning. *Revista Iberoamericana de Educación a Distancia*, *15*(1), 15-35. https://www.doi.org/10.5944/ried.1.15.775

Microsoft News Center (January 18, 2022). *Microsoft to acquire Activision Blizzard to bring the joy and community of gaming to everyone, across every device*. Retrieved from https://bit.ly/3Q2jJgR

Victoria-Mas, J. S., Ramos-Ábalos, E. M.ª & Arjona-Martín, J.-B.
**Crowdfunding in the production of video games in Spain:
Evolution and success on Kickstarter**

Mollick, E. (2014). The dynamics of crowdfunding: An exploratory study. *Journal of business venturing, 29*(1), 1-16. https://www.doi.org/10.1016/j.jbusvent.2013.06.005

Nucciarelli, A., Li, F., Fernandes, K. J., Goumagias, N., Cabras, I., Devlin, S., Kudenko, D. & Cowling, P. (2017). From value chains to technological platforms: The effects of crowdfunding in the digital game industry. *Journal of Business Research, 78*, 341-352. https://www.doi.org/10.1016/j.jbusres.2016.12.030

Paykacheva, V. (2014). Crowdfunding as a customer engagement channel. Doctoral dissertation, Kajaani University of Applied Sciences. Theseus. Retrieved from https://bit.ly/3w3mEfT

Pérez, Ó. (2016). Indie or Mainstream? Tensions and Nuances between the Alternative and the Mainstream in Indie Games. *Anàlisi Quaderns de Comunicació i Cultura, 54*, 15-30. https://www.doi.org/10.7238/a.v0i54.2818

Planells, A. J. (2015). Video games and the crowdfunding ideology: From the gamer-buyer to the prosumer-investor. *Journal of Consumer Culture*, *17*(3), 620-638. https://www.doi.org/10.1177/1469540515611200

Rayna, T. & Striukova, L. (2014). 'Few to Many': Change of Business Model Paradigm in the Video Game Industry. *Digiworld Economic Journal, 94*, 61-82. Retrieved from https://bit.ly/38TkR5p

Rodríguez-Magda, R. M. (2004). *Transmodernidad*. Barcelona: Anthropos.

Sánchez-González, M. & Palomo-Torres, M. B. (2014). Knowledge and Assessment of Crowdfunding in Communication: The View of Journalists and Future Journalists. *Comunicar*, *43,* 101-110. https://www.doi.org/10.3916/C43-2014-10

Sawhney, M., Verona, G. & Prandelli, E. (2005). Collaborating to create: The internet as a platform for customer engagement in product innovation. *Journal of interactive marketing*, *19*(4), 4-17. https://www.doi.org/10.1002/dir.20046

Simon, B. (2013). Indie Eh? Some Kind of Game Studies. *Loading,* *7*(11), 1-7. Retrieved from https://bit.ly/3P1qheS

Smith, A. N. (2015). The backer–developer connection: Exploring crowdfunding's influence on video game production. *New Media & Society, 17*(2), 198-214. https://www.doi.org/10.1177%2F1461444814558910

Stasik, A. & Wilczyńska, E. (2018). How do we study crowdfunding? An overview of methods and introduction to new research agenda. *Journal of Management and Business Administration*, *26*(1), 49-78. https://www.doi.org/10.7206/jmba.ce.2450-7814.219

Von Hippel, E. (2005). Democratizing innovation: The evolving phenomenon of user innovation. *Journal für Betriebswirtschaft*, *55*, 63-78.

Whitla, P. (2009). Crowdsourcing and Its Application in Marketing Activities. *Contemporary Management Research, 5*(1), 15-28. https://www.doi.org/10.7903/cmr.1145

Wulandari, Y. Y. & Arif, L. (2021). Strategy for empowering micro businesses during the COVID-19 pandemic in Surabaya City. *DiA: Jurnal Administrasi Publik*, *19*(2), 81-99.

Zhang, H. & Chen, W. (2019). Crowdfunding technological innovations: Interaction between consumer benefits and rewards. *Technovation, 84*, 11-20. https://www.doi.org/10.1016/j.technovation.2018.05.001

Victoria-Mas, J. S., Ramos-Ábalos, E. M.ª & Arjona-Martín, J.-B.
Crowdfunding in the production of video games in Spain:
Evolution and success on Kickstarter

Annexes

Annexes 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, and 11 are available in the Figshare data repository with the following doi: https://www.doi.org/10.6084/m9.figshare.23660094.v1