

Playing (with) sustainability: a multi-purpose gamification case

Alessia Zoppelletto¹ and Roberta Cuel²

^{1,2} Università di Trento, Trento, Italy
{alessia.zoppelletto; roberta.cuel}@unitn.it

Abstract. The paper analyzes a case study of “Gamindo”, a multi-sided digital platform that offers gamified services to answers the needs of three different types of actors: firms, non-profit organizations, and gamers. The analysis focuses on the interdependencies between actors/stakeholders in an intermediary digital platform that acts as a focal firm in the digital business ecosystem. The paper adopted a qualitative methodology, analyzing a four-year longitudinal case study of an Italian startup. Together with direct observation and participation in the development of the startup ecosystem in its early stages, the authors collected secondary data, interviews and organized several workshops. In the rapidly evolving context represented by the game industry, the selected case study highlights the growth of a highly innovative digital platform ecosystem combining new mutual relationships among inedited actors of the market. Gamindo ecosystem can be seen as a catalyst of purpose-driven actors that are complementary addressing the challenges of sustainability, producing positive externalities also for the environment and society as a whole. The digital platform ecosystem produces innovation for every single participant to the ecosystem: i) the contributors (usually profit firms that want to promote CSR), ii) non-profit organizations that need to raise resources for social projects iii) the users or gamers that desire to play and donate. This study focuses on a single case and its findings are hence not generalizable. It would be interesting to study sustainable gamification cases in different socioeconomic contexts as well as in different industry settings. The paper has both practical and theoretical implications. It contributes to the rapidly growing body of literature investigating both gamification for business and business ecosystems. Authors contribute to the existing CSR literature providing new insights on how intermediaries platforms may play a role in the widespread of the new practices connected with the sustainability outcomes. From a practical point of view, the paper shows how through the use of purposed-advergaming, firms can develop CSR activities; how non-profit organizations may raise money due to networking externalities and the involvement of gamers/donators; how Gamindo, developing a multi-purposed game ecosystem, is becoming a focal firm.

Keywords: Casual game, Advergaming, Digital Business Ecosystem, Intermediary Platform, Sustainability.

1. Introduction

In 2021, 1 billion of online gamers worldwide (with China, South Korea, and Japan) are estimated with 21.1 billion U.S. dollars of global revenues. Because of the Covid-19 pandemic emergency, these numbers grew up to 22% and in 2025, online gaming audiences are projected to surpass 1.3 billion¹. Game market, serious games, purpose games, and gamification have received increased attention by marketing firms and CSR Departments, by both public and nonprofit organizations. Many intermediaries have faced the market providing games for uses and solutions for companies that need to offer different services such as: workers learning, consumer advertising, brand awareness, etc.

In this scenario, gaming platforms became real collaborative environments that co-create values as in a typical interorganizational system and network (Schoenberger, 1988). As pointed out by Marchand and Hennig-Thurau (2013) the phenomena of technological platforms within the digital game industry sector is increasing, as a result of the disruptive transformations occurred along with its value chain (Nucciarelli et al., 2017). These gaming platforms can be analyzed using the digital business ecosystem framework, since these types of digital platform ecosystems comprise a “*platform owner that implements governance mechanisms to facilitate value-creating mechanisms on a digital platform between the platform owner and an ecosystem of autonomous complementors and consumers*” (Hein et al., 2020, p. 90).

In the paper the suggestion of Jacobides et al. (2018), to provide empirical studies within the framework of business ecosystems, particularly asking for “*longitudinal, within-industry or cross-industry research linking changes in modularization with the emergence and growth of ecosystems*” (Jacobides et al., 2018, p. 2267) is taken into consideration. Therefore, a four-year longitudinal case study is proposed: Gamindo a multi-sided platform that acts as an intermediary digital platform providing gamified services to three different types of actors. In the paper we focus on the interdependencies between stakeholders.

Gamindo as many gaming platform allows enterprises to develop innovative Corporate Social Responsibility campaigns giving new insights also on the emergence of the phenomena of multi-purpose gamification.

In the next Section the literature review is sketched out, in Section 3 the methodology is described. In Section 4 and 5 the case is presented and analyzed. Finally, discussion and conclusions are depicted.

2. Literature Review

2.1 Business ecosystems

Among others the theoretical contributions of digital business ecosystems, is an interesting lens of analysis of interorganizational systems and networks, since both

¹ <https://www.statista.com/topics/1551/online-gaming/> last retrieved 1/6/2021

social and technical factors are simultaneously taken into consideration. The term digital business ecosystem was initially referred to as a “...*collaborative environment made up of different entities that co-create value through information and communication technologies* (Nachira et al., 2007)” (Senyo et al., 2019). The early notion of business ecosystem has been catching attention in the practitioners world for several years, while still requiring further theoretical development and commonly accepted definitions in the academy of sciences. The last few years have clearly registered an increasing attention on ecosystems; for example, the bibliometric analysis in Suominen et al. (2019) shows a citation network of over 300 selected papers on this topic. In recent years, significant steps towards a systematic analysis of this concept have been accomplished. Useful reference points are studies from different perspectives of value co-creation in ecosystems (Ceccagnoli et al., 2011; Wareham et al., 2014; Vargo et al., 2015; Pera et al., 2016, Beirão et al., 2017; and Cennamo et al., 2019). Using a grounded-theory-based literature review, Senyo et al. (2019) evidenced relevant gaps for future research and a specific need for theorization. Early partial answers to the need for a systematic understanding are given by de Reuver et al. (2018), with a convincing comparative analysis of digital platforms and digital ecosystems, and by Gupta et al. (2019) who classified different types of ecosystems (business, innovation, and digital). A recent study (Jacobides et al., 2018) gave an important contribution towards a theory of ecosystems, drawing a crystal clear distinction between ecosystems and entities like hierarchies, markets, alliances, networks or other forms of business aggregation: an ecosystem is typically formed by a set of actors experiencing (different degrees of) complementarities in production and consumption. The analysis of production and consumption complementarities is carried out also by Subramaiam et al. (2018) who develop the concept of digital envelopes and product-in-use information. Even if it works perfectly in the cases of Industry 4.0, it can be used as a reference for services too. Hou and Shi (2021) suggest that a coevolution view helps in understanding the complementarities between actors, and the way in which affiliation in ecosystems occur allowing the focal firm to continuously innovate.

2.2 Gamification and sustainability

Marchand and Hennig-Thurau (2013) by doing their extensive review of the game-related literature pointed out that the game industry sector showed a great transformation over the last decade. The field of applied gaming such as serious games, purpose games, and game mechanics or gamification has been developed for serious purposes (Fleming et al., 2016). Games on purpose usually provide a useful and attractive new method of learning and empowerment, imparting knowledge or skills in an engaging and motivating way to a new generation of learners (Argenton et al., 2016). On the other side, serious games, game mechanics and gamification seek to employ games (or substantial game elements) in an effort to educate and change patterns of experience and/or behaviour (Deterding et al., 2011).

Additionally, games (in particular mobile games) have the potential be leveraged as a new communication channel for sustainability actions. Communication and storytelling have the potential role to multiply the impact of sustainability activities, when stories and case studies are shared (Alinikula et al., 2014).

In their study, Alinikula et al. (2014, p 247) pointed out that “*mobile technology offers great opportunities for renewing corporations’ sustainability agenda*”, since

they engage with gamers, a new segment of people. Games capture the full attention of players, might propose stories, activities, and banner connected to the sustainability agenda and strategy of communication of a company.

An increasing number of intermediary platforms that combine gaming with sustainability issues are spreading in all Europe. Among others, authors identified six innovative digital intermediary platforms and summarized some of their most significant features in Table 1.

Table 1 - Intermediary platforms: stakeholders involved

<i>Intermediary</i>	<i>Stakeholders involved by the Intermediary's platform</i>					<i>Intermediary's year of birth</i>
	<i>For Profit</i>	<i>Users</i>	<i>Non profit</i>	<i>Public sector</i>	<i>Intermediary's Payoff</i>	
<i>GreenAPES</i>	✓	✓		✓	<i>"The social network for the environmental sustainability"</i>	2014
<i>Gamindo</i>	✓	✓	✓		<i>"Donate by playing video games"</i>	2017
<i>Donapp</i>	✓	✓	✓		<i>"Put together companies and non-profit organizations, allowing consumers to donate "at zero cost" by buying goods and services online or physically in the shops that join the circuit"</i>	2013
<i>Charity Miles</i>		✓	✓		<i>"Walk, Run, Bike for a Cause"</i>	2012

<i>Treedom</i>	✓	✓	✓		"Let's green the planet"	2010
<i>WeGivelt</i>	✓		✓		"Digital for Brands with Purpose"	2015

The first intermediary presented is *GreenAPES*: a platform that provides services to three different stakeholders: the public actor, enterprises and individuals. Through the platform the public administration can develop virtual and real games, spurring citizens to change behaviours toward more sustainable attitudes, to measure and reward their sustainable behaviors. The public actor can decide which actions to reward (mobility, waste management, participation and volunteering, energy savings, local consumption, etc), by developing a game and a scheme of incentives and rewards. Enterprises can benefit from the platform to attract consumers who are attentive to sustainability issues and involve citizens in loyalty programs, by using the platform to develop Corporate Social Responsibility projects and strategies. *GreenAPES* also offers tailor-made solutions to involve the company's employees in Corporate Social Responsibility projects. Finally, even single individuals can benefit from the platform participating and developing a community, which shares good practices and promotes the adoption of new eco-innovative processes and habits.

The second intermediary is *Gamindo*, which involves enterprises, non-profit organizations and users. Through *Gamindo* the user/gamer can donate to specific social projects by playing the video games. The economic resources donated to the campaign receivers do not come from the users, instead these funds come from CSR investments done by enterprises that have the opportunity to customize the games transforming them into an advergaming. This will be used to sponsor products, services, and brands in the games available on the platform. Receivers, usually non-profit organizations, will obtain the donations through the platform in a simple and transparent way.

DonaApp is the third intermediary platform proposed. It involves companies, non-profit organizations and users. The platform allows users to transform their purchases (made at the shops of the circuit) into donations. Consumers, companies, non-profit organizations create a virtuous ecosystem from which everyone benefits. The donation in this case goes for the 50% of the amount donated to the non-profit chosen by the user, and the other 50% to the one selected by the store/company.

Charity Miles is an intermediary for users and nonprofit organizations that enables people to earn money for charity whenever they walk, run or bike. In this platform a community of people sharing the same interests (sport) is created by building a scheme of incentives, prizes and rewards. Many people raise money by doing things like marathons and run competitions. The more money users earn for their selected charity, the more chances they'll have to win cool prizes from the platform's sponsors.

The fifth intermediary is *Treedom*, which involves enterprises, nonprofit organizations and users. Through the donation of users or firms, *Treedom* finances farmers' companies who want to plant trees in Asia, Africa, South America and Italy. The platform supports the work of these farms in the early years, when trees are still not productive. Farmers receive know-how and technical support from *Treedom* for planting and tree management. The trees are photographed, geographically localized

and monitored by Treedom over time. Through its planting activities, Treedom contributes to the achievement of 10 Objectives to ensure a sustainable future.

The last intermediary presented is *WeGiveIt*, which involves enterprises and non-profit organizations. The platform works with ethical businesses and charities helping to optimize their digital brand presence and develop their cause marketing strategy. The platform mediates the needs of charities that ask for help in navigating the digital transformation, and enterprises that need advice on incorporating their sustainable side into their overall marketing and business strategy.

Based on the contributions summarized in the previous section, this study identifies the need to provide extensive insights into the field of purpose gaming and to answer the research question by presenting a case of an Italian startup that represents an intermediary in the purpose-driven gamification market.

3. Methodology

To provide a more in depth understanding of the business model, the processes, the interdependencies among actors of a digital ecosystem platform, the paper investigates one of the above-mentioned intermediary solutions: Gamindo. It is an innovative startup that links together different purpose-driven actors (i.e., for profit, non-profit and gamers). Authors selected Gamindo also because of the deeper understanding of the case, in fact one of the authors was actively involved in the startup's strategy definition from 2018 to 2021, and in the preparation of Gamindo's business plan.

In line with Eisenhardt (1989) and Yin (1984), an explorative case study is conducted to analyze the phenomena of a purpose-driven ecosystem, taking into consideration the multi-purpose gamification. Data was collected during the whole process, at several points of time, and a blueprint was developed (see Figure 1) to better understand how the purpose-driven ecosystem was created. The evolution of the intermediary involved the following phases: (1) foundation and beta testing, (2) Incubation period in a startup accelerator, and (3) Systematic growth.

Figure 1 – Gamindo’s blueprint. Source: Author’s elaboration



In 2018 Gamindo’s first founder, Nicolò Santini, developed the original idea during his master’s thesis project. Very soon also the second founder of Gamindo, Matteo Albrizio, decided to join the project, together with some game developers. During this first stage of Gamindo’s evolution, the business plan was written, some partnerships with enterprises and non-profit organizations were developed. Thanks to these activities, the first funds were raised, and the first beta test of the platform was created. The authors named “*foundation and beta testing*”, this first-year of Gamindo.

Later, a key event happened: the well-known startup accelerator, Plug&Play, incubated Gamindo allowing them to develop the beta version of the platform and, thanks to the competences acquired during the incubation period, the project was refined, particularly concerning its blueprint and hardware investments. This second phase, which lasts another year, was named by the authors “*incubation period in a startup accelerator*”.

Eventually, from 2020 until now the platform experienced a phase of “*systematic growth*” since the startup grew a lot: the team was enlarged and is still increasing (this month 6 new job offers have been published in the Gamindo website). Moreover, several important partnerships have been done both with large companies (e.g. Nespresso, Coca-Cola, etc) and large non-profit organizations (e.g. WWF, Emergency, etc) and the number of gamers all over the world is still increasing. Additionally, from the financial point of view, in August 2021 Gamindo made a capital injection of 450.000 € and modified its shareholder structure thanks to new investors.

Data was collected through participant observation, personal interviews by collecting written material, both online and offline (e.g. published official documents, internal documents, articles and company brochures) (see Table 2).

Table 2 - Data collection. Source: Author's elaboration

Collected Data	Number	Note
Phase 1: Creation and beta testing		
Focus Group	5	At the beginning of the path (May 2018), five different focus groups led to the definition of the business plan. The figures involved in the process have been the two founders, and two business angels: a research fellow of the University of Verona and an accountant.
Direct observation	2	In two different days (one before the creation and one after the definition of the business plan) the startup pitched the business idea to investors.
Internal Document	1	A business plan have been shared by the startup with investors and business angels in order to participate to a national contest on research and innovation (so-called "PNI", i.e. Premio Nazionale per l'Innovazione/National Prize for Innovation).
Direct participation	3	Three days of activities for beta testing of the platform.
Phase 2: Incubation period in a startup accelerator		
Online Published Internal Document	1	A document on the crowdfunding campaign to get to San Francisco's incubator has been published by the startup in order to benefit from the opportunity to participate in an accelerator phase at Plug & Play.
Interviews	3	During phase 2, three informal interviews have been done with the two founders of the startup to understand the development of the incubation phase.
Direct observation	4	During direct observations, researchers participated in several meetings, to discuss the points of strength and weaknesses of the digital platform, and to the business process analysis of inefficiencies. Researchers also participate in the repetitive testing of the new advergames in this phase.
Phase 3: Systematic growth		
Interviews	1	During Phase 3: one structured interview was collected on the topic of the future of the Platform and stakeholders involved by the intermediary.
Notes from direct observations	20 pages	Several notes were taken during all the phases of the Project. Official documents, internal documents, articles, and company brochures were consulted.

By using the theoretical framework of digital business ecosystems and a qualitative narrative approach, in this section we analyze the multi-purpose gamification ecosystem where Gamindo intermediary operates. Each stakeholder involved in the ecosystem will be analyzed through the narrative of the Gamindo's founders, by quoting directly their words during interviews.

4. Case presentation

Gamindo digital platform provides branded video games aimed at both promoting a company's products/services and involving gamers to play. This enables the company to donate to non-profit organizations.

In practice, the platform contains a list of advergames, each one of them is a branded casual-game made by Gamindo for a specific company. Casual games are very simple video games targeted at a wide, mass market audience, with a very simple set of rules, shorter sessions, and less learned skill than hardcore games. The advantage of these games is that they can be played anywhere and at any time by all. The casual games can be totally customized on the specific needs of a firm or chosen among a list - a game catalog - and then branded by the Gamindo team. The amount of money that the company pays depends on two factors: the development of the advergence and the related advertising campaign, and the investment in Corporate Social Responsibility (CSR), namely the donation to the third party.

This number of resources allow gamers to collect coins (or stars) and then choose where to allocate them among the non-profit's social projects available in a specific Gamindo's catalogue. The virtual coins are transformed into a real economic value given to the third parties (usually specific social projects made by non-profit organizations) by companies' CSR campaigns. In this case, gamers donate just by spending time on the platform and playing, companies improve their CSR campaigns and non-profit organizations get their project funded. To ensure maximum transparency on how funds are allocated, the gamers allocate the coins and choose the specific social project. Moreover, once a social project is completely founded, the gamer will receive feedback informing him on how the money has been donated to the institution and has been used. Founders called Gamindo as a "*win-win-win platform*" in which users have fun and donate without spending money, companies promote their brand in an engaging CSR game, and non-profit organizations raise funds. Everything is done in a transparent manner raising the trustees of the platform.

5. Case analysis

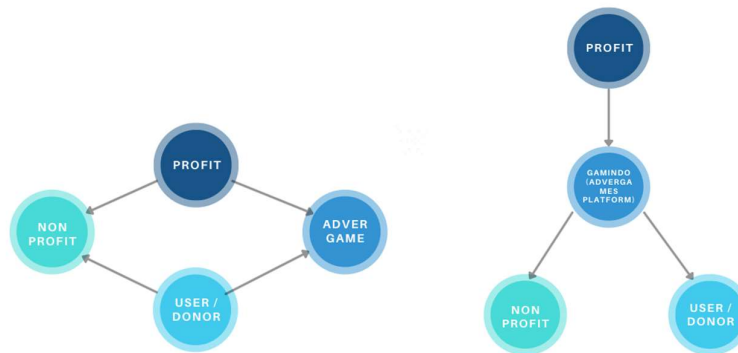
Gamindo represents the focal firm of a business ecosystem based on a digital platform that develops a technological standard and creates and maintains *ties* among three groups of stakeholder: profit firms, non-profit organizations and gamers. Gamindo is an intermediary providing a disruptive innovation since: (1) firms approach advergames and implement CSR activities, (2) users/gamers approach donation, (3) non-profit organizations approach the economic sustainability of their social projects.

As schematized in Figure 2, Gamindo changed the relationship between firms, clients, and non profit organizations by mediating it and collecting the different needs of the various stakeholders. Moreover through a transparent process added value to the whole network, enabling trustiness and positive externalities. In this multi-purpose gamification ecosystem, the *focal firm* manages a *technological standard* represented by the development of its advergames that are customized on the specific needs of each stakeholder. Moreover, each game can be considered as a digital envelope in which data about its utilization are collected and managed by the focal firm. Ss shared by one of the Gamindo founders:

“A large enterprise for whom we will make a game in September [2021] contacted us saying that you are the only ones in the world who do this therefore we want to do it with you.”

In the following paragraphs each stakeholder’s contribution, needs and peculiarities will be discussed in detail, by highlighting also if and how the intermediary induces stakeholder to adopt new behaviors.

Figure 2 - Enterprises’ CSR strategy with and without Gamindo digital platform.



5.1 Enterprises

Enterprises are one important actor involved in the ecosystem. Their contribution concerns the investments in CSR made and converted by the platform into donations. Firms’ need is to engage with potential customers through sustainability-oriented advergames that have the characteristic that the online promotion of the brand image it’s perfectly integrated in the videogame.

“Our bet is that the interaction of the video game creates an engagement with the potential customer that is stronger than the one provided by an image or a video. These traditional ways of promoting a business can not guarantee a high level of attention of the audience that looks at your content. Therefore, an euro invested in Gamindo has more value than a euro invested in traditional types of advertisement such as television or radio. Moreover, firms also obtain benefits in terms of reputation, by using a form of socially responsible advertising that allows linking advertising with CSR” (Founder of Gamindo).

For firms Gamindo represents an innovative way to do CSR, different from the traditional ones, indeed: “the common points that we saw among the companies that contact us, embracing the Gamindo solution were: the theme of creating new languages to engage consumers and increase the awareness in the need to have an impact from a social and environmental point of view realizing that this is something that really matters a lot to consumers that are more and more looking to the quality of the products and to the company behind that product” (Founder of Gamindo).

Eventually, it is interesting to notice that Gamindo’s solution modify also business practices since induces firms to behave in a different way and to create new synergies between the CSR Department and Marketing Department: as stated by one of the

founders: *“To enter the platform is not always easy because in large companies the Marketing Department that deals with the advertisement and the CSR Department that deals with social responsibility do not speak to each other. If we should simply deal with Marketing Departments and not care about the social impact, we would probably put 70% less effort because the hardest part is connecting these two worlds inside the company that, in most cases, do not communicate”.*

5.2 Individual users or gamers

Individual users choosing Gamindo to play casual video games answer their need to donate without spending, asking for transparent financing of social projects. At the same time, they effectively contribute to the platform ecosystem by impartially allocating economic resources (the collected coins). What is peculiar to this gaming ecosystem is that the target users are very variegated:

“The gamer that plays this kind of advergaming isn’t the “typical nerd” that comes into the mind of all of us when we think of video game players. We address the “casual gamers” that are people playing video games in their free time, enjoying simple games. These people instead of choosing games that have a lot of annoying advertisements during the game experience (such as banners), can use Gamindo that doesn’t have invasive advertising and where they can also have the social benefit of converting their time into donations.

Contrary to the common thinking, game players aren’t only males: the share is 49% females and 51% males. Eventually, The gamer of Gamindo can be a person of any kind of age: 14-17 years old (6%), 18-24 years old (12%), 25-34 years old (18%), 35-44 years old (24%), 45-54 years old (20%), 55-64 years old (10%), >65 years old (9%)” (Founder of Gamindo).

Eventually, Gamindo platform has also some positive externalities:

“By giving users rewards (coins) and by giving incentives such as statistics of the game, the platform helps to motivate people to continue playing in order to see the results of their positive actions” (Founder of Gamindo).

In this way the platform sets the conditions to achieve economic sustainability of social projects over time. For this reason, in the future Gamindo will also allow users to directly donate their private resources inside the platform.

5.3 Non-profit organizations

Non-profit organizations are the beneficiaries of the platform and can be divided essentially into two classes: the international non-profit organizations, which operate in several countries, and which are well structured, and the local organizations, that are smaller and less articulated.

Gamindo intermediary enables engaging fundraising activities for both classes of non-profits in a new and innovative way by keeping a small share of the donation for the payment of its service. Non-profit organization’s contribution regards the proposition of valuable social projects that can be included in the platform and selected by users. Their urgency is to collect economic resources (or donations) to finance the above-mentioned social projects and sensitize the population to those important causes.

“For the Third Sector, the value of the platform is represented by its ability to raise public awareness about social causes, increase confidence in non profit organization by incrementing transparency and, above all, raise funds to help in guaranteeing their economic stability in the long term”.

Gamindo platform, through its innovative services, induces nonprofit firms to be proactive in presenting to the platform its projects, helping these organizations to communicate the value and the importance of their social projects.

5.4 The future of the multi-purpose gamification ecosystem

To conclude, it should be said that this new ecosystem has a lot of growth potential. By using the words of one of the the Gamindo founders:

“in the future many new players are going to grow or to join the ecosystem. For instance, nowadays the eSports industry is growing and the visors industry is developing its technology. Additionally new dimensions are going to enter inside the world of videogames, let’s think for example to the potential of the music industry. Just to give an example of the magnitude that the following developments can have in this market, let’s think to the Travis Scott’s concert that took place inside the Fortnite game in April 2020, that has been followed by 27.7 million players. Moreover, Burger King’s case was interesting too, because it put together the world of enterprises with the real world passing through a game: if you won something in the game, then you receive a free coupon to have food product in real life.”

Moreover, regarding new potential competitors the point of view of the startup is very clear:

“Currently there are no direct competitors that use video games like Gamindo but there are still competitors who use gamification to give people the opportunity to donate such as charity Miles. We hope that new players are going to grow in this sector (also companies that will do similar things to us) because this means that there is a market, that this market attracts collective attention and that there is demand. This is a very positive thing that happened to other innovative startups in the past. For example Just Eat was born in 2000 and in 2011 other competitors entered the market (for example Deliveroo, Foodora). Since then, Just Eat has not declined, on the contrary has grown even more” (Founder of Gamindo).

6. Discussion and conclusion

This paper focuses on the impact of intermediaries in multi-purpose gamification ecosystems by presenting the case of Gamindo, which is an intermediary that developed an innovative digital platform based on purpose gaming. As stated by Gawer and Cusumano (2014) digital platforms have enabled a relevant industry transformation and created new foundations for ecosystem innovation.

In the last ten years, the game market saw the growth of new digital gaming platforms with a particular orientation to sustainability issues, founded by several intermediaries that have started to mediate the relationship among different actors (enterprises, users, non-profit and public actors), to address a sustainable challenge. These platforms, allowing to answer their needs of very different actors through multi-sided platforms offering gamification services, highlight the emergence of the phenomena of multi-purpose gamification.

In this scenario, Gamindo emerged as a first mover in the scenario of sustainability-oriented digital gaming platforms, allowing the intermediary to exploit not only the benefits connected to network externalities but also to the fact that the startup represents the first mover and the focal firm in this particular ecosystem.

We can notice that in this particular case the ecosystem itself doesn't produce innovation only for the end user but actually produces innovation for every single participant to the ecosystem that is both contributor and user.

Finally, since sustainability represents a global issue and needs to be addressed in a collaborative way from different stakeholder's perspectives, this case study highlights the potential of a multi-purpose gamification ecosystem to represent an innovative way in guaranteeing the economic sustainability of social projects in the long term. Indeed, Gamindo ecosystem can be seen as a catalyst of purpose-driven actors (for profit firms that want to do CSR, non-profit organizations that try to raise resources for social projects and gamers that desire to donate) that are complementary in addressing the challenges of sustainability, producing positive externalities also for the environment and society as a whole.

6.1 Practical Implications

Our results have several important implications. First, through the use of purposed-advergames, firms are helped in incorporating their sustainable side into their overall marketing and business strategy, thus strengthening the engagement with their stakeholders. Indeed, several studies demonstrate that sustainability-oriented firms are more likely to benefit from the support of more loyal customers in difficult times, therefore these firms can improve their financial resilience.

Secondly, non-profit organizations can benefit from the development of this kind of gaming platforms to sensitize people to social causes, and to guarantee the supply of social services and social projects in the long run. Moreover, by exploiting these solutions, charities that need help in navigating the digital transformation, can improve the communication strategy of their social projects and increase the awareness on global and local issues.

Thirdly, the development of multi-purposed game ecosystems can have effects also at the individual level since previous studies have found that purpose and cause related games (often called prosocial games) increase mutual helping behavior.

Finally, sustainability-oriented policymakers can benefit from the existence of these particular ecosystems that, together with public resources, help in guaranteeing the economic sustainability of social projects carried out by non-profit organizations.

6.2 Theoretical Implications

Authors contribute to the existing CSR literature providing new insights on how intermediaries platforms may play a role in the widespread of the new practices connected with the sustainability outcomes.

Authors also propose an interesting case study, in which the digital business ecosystem theory is used to identify actors' interdependencies. Moreover, the specific characteristics of the case study demonstrate that the theoretical model can be used to analyze small-medium size networks, underlying the role of digital platform intermediaries as focal players in the digital business ecosystems.

Finally, the study contributes to the rapidly growing body of literature investigating both gamification for business and business ecosystems.

6.3 Limitations and venues for future research

Our study's limitations should be considered when interpreting its results. First, since this is a case study, the generalizability of this study's outcomes is possible only to a limited extent. Additionally, this paper focuses on the market sustainability-oriented advergaming and other ecosystems employing gamification elements can have different peculiarities. Indeed, these limitations can be considered as venues for future research. For instance, future studies can try to investigate and compare the present case with other intermediary platforms and other ecosystems employing gamification mechanisms can be analyzed.

References

- Alinikula, P., Latikka, J.L. and Paanajarvi, J. (2014), "Gaming for good changing the game for corporate sustainability", *ICT for Sustainability 2014, ICT4S 2014*, No. Ict4s, pp. 245–247.
- Argenton, L., Pallavicini, F., Barone, G., Zini, A., Garcea, G., Zancacchi, A., & Mantovani, F. (2016). Hacking well-being: Can serious games fit positive technology framework?. In *Integrating technology in positive psychology practice* (pp. 230-246). IGI Global.
- Beirão, G., Patrício, L., Fisk, R.P., 2017. Value co-creation in service ecosystems: Investigating health care at the micro, meso, and macro levels. *Journal of Service Management* 28, 227–249.
- Ceccagnoli, M., Forman, C., Huang, P., & Wu, D. J., 2012. Cocreation of value in a platform ecosystem! The case of enterprise software. *MIS quarterly*, 263-290.
- Cennamo, C., Santaló, J., 2019. Generativity Tension and Value Creation in Platform Ecosystems. *Organization Science* 30, 617–641.
- De Reuver, M., Sørensen, C., Basole, R.C., 2018. The Digital Platform: A Research Agenda. *Journal of Information Technology* 33, 124–135.
- Deterding, S., Dixon, D., Khaled, R., & Nacke, L., 2011 (September). From game design elements to gamefulness: defining "gamification". In *Proceedings of the 15th international academic MindTrek conference: Envisioning future media environments* (pp. 9-15).
- Eisenhardt, K.M. 1989, "Building Theories from Case Study Research", *Academy of Management Review*, Vol. 14 No. 4, p. 548.
- Fleming, T. M., Bavin, L., Stasiak, K., Hermansson-Webb, E., Merry, S. N., Cheek, C., & Hetrick, S., 2017. Serious games and gamification for mental health: current status and promising directions. *Frontiers in psychiatry*, 7, 215.
- Gawer, A., Cusumano, M.A., 2014. Industry platforms and ecosystem innovation. *J. Product Innov. Manag.* 31 (3), 417–433.
- Gupta, R., Mejia, C., Kajikawa, Y., 2019. Business, innovation and digital ecosystems landscape survey and knowledge cross sharing. *Technological Forecasting and Social Change* 147, 100–109.
- Hein, A., Schreieck, M., Riasanow, T., Setzke, D.S., Wiesche, M., Böhm, M. and Krcmar, H. (2020), "Digital platform ecosystems", *Electronic Markets, Electronic Markets*, Vol. 30 No. 1, pp. 87–98.
- Jacobides, M. G., Cennamo, C., & Gawer, A., 2018. Towards a theory of ecosystems. *Strategic Management Journal*, 39(8), 2255–2276.

- Kopalle, P. K., Kumar, V., & Subramaniam, M., 2020. How legacy firms can embrace the digital ecosystem via digital customer orientation. *Journal of the Academy of Marketing Science*, 48(1), 114–131.
- Marchand, A., & Hennig-Thurau, T. (2013). Value creation in the video game industry: Industry economics, consumer benefits, and research opportunities. *Journal of Interactive Marketing*, 27, 141–157.
- Nachira, F., Dini, P., Nicolai, A., 2007. A network of digital business ecosystems for Europe: roots, processes and perspectives. *European Commission*, Bruxelles, Introductory Paper 106.
- Pera, R., Occhiocupo, N., Clarke, J., 2016. Motives and resources for value co-creation in a multi-stakeholder ecosystem: A managerial perspective. *Journal of Business Research* 69, 4033–4041.
- Schoenberger, E., 1988. From Fordism to Flexible Accumulation: Technology, Competitive Strategies, and International Location. *Environ Plan D* 6, 245–262.
- Senyo, P.K., Liu, K., Effah, J., 2019. Digital business ecosystem: Literature review and a framework for future research. *International Journal of Information Management* 47, 52–64.
- Subramaniam, M., Iyer, B., & Venkatraman, V., 2019. Competing in digital ecosystems. *Business Horizons*, 62(1), 83–94.
- Suominen, A., Seppänen, M., Dedehayir, O., 2019. A bibliometric review on innovation systems and ecosystems: a research agenda. *Euro Journal of innovation management* 22, 335–360.
- Vargo, S.L., Wieland, H., Akaka, M.A., 2015. Innovation through institutionalization: A service ecosystems perspective. *Industrial Marketing Management* 44, 63–72.
- Wareham, J., Fox, P.B., Cano Giner, J.L., 2014. Technology ecosystem governance. *Organization Science* 25, 1195–1215.
- Yin, R.K., 1984, *Case Study Research: Design and Methods B2 - Case Study Research: Design and Methods*, Sage Publications, California, CA.