Association for Information Systems
AIS Electronic Library (AISeL)

Research Papers

ECIS 2019 Proceedings

5-15-2019

DYNAMICS OF SUCCESS FOR MOBILE GAMES: THE CASE OF EARLY-STAGE STARTUPS

Maryam Roshan
Aalto University School of Business, maryam.roshan@aalto.fi

Riitta Hekkala
Aalto University, riitta.hekkala@aalto.fi

Virpi Kristiina Tuunainen
Aalto University School of Business, virpi.tuunainen@aalto.fi

Follow this and additional works at: https://aisel.aisnet.org/ecis2019_rp

Recommended Citation

DYNAMICS OF SUCCESS FOR MOBILE GAMES: THE CASE OF EARLY-STAGE STARTUPS

Research paper

Roshan, Maryam, Aalto University, Espoo, Finland, maryam.roshan@aalto.fi

Hekkala, Riitta, Aalto University, Espoo, Finland, riitta.hekkala@aalto.fi

Tuunainen, Virpi Kristiina, Aalto University, Espoo, Finland, virpi.tuunainen@aalto.fi

Abstract

The competitive mobile app markets along with the lack of business experience of mobile app startups has created many challenges for startups in their efforts to create a viable business through developing and publishing apps. In this study, we collected data from 20 international mobile game startups that were working on their first commercial game with the aim to develop a successful game as the first step toward a successful business. Through a classic grounded theory methodology, we developed a theoretical model. Our model depicts how startups work with three requirements of visibility, quality and user engagement toward success while enhancing each and every one of the requirements through online and offline social interactions with various members of the mobile ecosystem. Our study contributes to the existing literature on mobile app development and the interactions of startups with the platform owner, users, and their games artefact particularly by highlighting how the startups leverage the social aspects of mobile app platforms for success. It also contributes to the knowledge on business creation in startups through explaining the fundamental factors that early-stage mobile game startups consider in their work on mobile platforms to create a successful business.

Keywords: Mobile game success, Startup, Creating business, Grounded theory.

1   Introduction

Mobile platforms provide opportunities for third-party application (app) developers and independent startups to create and distribute their apps to smartphone users (Bergvall-Kåreborn and Howcroft 2011). The existence of strong same-side and cross-side externalities (Rochet and Tirole, 2003) among and between app developers and users increase the value of these platforms (Bharadwaj, El Sawy, Pavlou and Venkatraman, 2013) for platform owners, developers, users and other actors that have shaped the ecosystems around the platforms (Garg and Telang, 2013). However, it also results in an intense competition among app developers attempting to gain attention to their apps. This is further influenced by the strong market-making role of the platform owner through app store structures and its ranking lists (Qiu, Gopal and Hann, 2017). In fact, the app store structures are challenging for the early stage developers and startups without sufficient financial means to invest in marketing efforts to bring their apps to the attention of potential users (Bresnahan, Orsini and Yin, 2014).

Game apps, as the largest category of apps on all major platforms (Merikivi, Tuunainen and Nguyen, 2017), face some additional contextual challenges. Games are played for the purpose of entertainment and enjoyment (Okazaki, Skapa and Grande, 2008) which may entail different attributes for different users. This makes game players a heterogenous group of users in terms of demands and expectations (Yin, Davis and Muzyrya, 2014). In addition, availability of many alternative games results in the tendency of game players to replace a game immediately with another if their expectations in terms of content or technical features are not met (Yin et al., 2014). Because of the high level of competition,

mobile games have a very narrow time window to attract users at the release time (Yi, Lee and Kim, 2017).

Many mobile app developers are independent startups responsible for the entire life-cycle of their product, first from conceptualization to development and then to sales and customer care (Qiu et al., 2017). Extant literature agrees on the common challenges of startups to be limited resources and lack of expertise in product, market, and business strategy design (Paternoster, Giardino, Unterkalmsteiner, Gorschek and Abrahamsson, 2014). In the context of mobile apps, startups have to also deal with additional challenges due to working on multiple platforms and global markets, ambiguity about platform owners' strategies, heavy control of platform owners on the markets, and the fierce competition (Bergvall-Kåreborn and Howcroft, 2014).

To cope with the range of challenges, startups take various approaches, such as participating in business accelerators to expedite their growth (Cohen, 2013) and adopting an iterative approach in developing products based on users' feedback. In iterative approach, the first step is to create a minimum viable product (MVP) which is a version of the product with just enough features to be tested by customers in order to gain validated learning through the cycle of build-measure-learn (Ries, 2011). Startups also apply the concept of iteration to finding an appropriate business model, that is, the most applicable way to create value (Amit and Zott, 2001; Ojala, 2015). Business models of software startups are initially shaped around the startup founders' core vision without concreteness, and consequently dynamic and in permanent flux (Spiegel, Abbassi, Zylka, Schlagwein, Fischbach and Schoder, 2016). Experimentation in business model design and evolutionary approach in developing software products has been found to be highly beneficial for startups (Bosch, 2012).

Nevertheless, defining a well-structured business model with attention to scalability is challenging for software startups (Abrahamsson et al., 2016; Standing and Mattsson, 2016). For mobile app startups, the challenge begins with defining a suitable product for the market. The designed apps need to combine both technical and market appeal (Qiu et al., 2017). Given that the startup founders are typically software developers without much (if any) business experience, early stage startups struggle with the business and sales aspects of the app market (Bergvall-Kåreborn and Howcroft, 2014). It has been emphasized that the success of an app is not defined by the design of the app artefact alone, but other supporting market activities are also important (Ghazawneh, 2016; Bergvall-Kåreborn and Howcroft, 2011). However, extant research does not go beyond highlighting the importance of marketing and a more holistic view in discussing how app startups create a viable business through developing and publishing apps to users is still missing.

In this paper, we present the findings from our empirical study where we take a broad view of mobile game development in terms of market success. Based on the interview data of 20 game startups who were working on their first commercial game, we develop a theoretical model that describes the dynamics among the requirements that early stage startups consider in their activities to succeed with their first game. We pay special attention to how the startups take advantage of the social aspects of the platform-based business in enhancing each of the requirements and the dynamics among them. Accordingly, we define our research question as "What factors contribute to early-stage mobile game startups' success toward future expansion of business?".

We conducted semi-structured interviews with mobile game startups who were participating in an accelerator program, and use the Classic Grounded Theory Methodology (GTM) to analyze and theorize our data (e.g. Glaser 1992). Complementing the earlier research on actions that app developers take to balance market and technical aspects of app development (e.g. Qiu et al., 2017), we contribute to the literature on developing mobile apps with specific attention to the endeavors of mobile game startups in utilizing the social resources of the platform. We also contribute to the existing knowledge on startup business development by explaining the requirements of success that are considered by mobile game startups and highlighting how startups use the social aspects of the mobile app platforms in enhancing each requirement.

The remainder of paper is organized as follows. In the next section, we present our literature review. In Section 3, we explain the research setting and method. In Section 4, we present our empirical find-

ings and our empirically-based theoretical model. Then we discuss our model constructs in the light of existing literature, and finally conclude the study in Section 6 by suggesting avenues for future research.

2   Literature Review

In this study, we follow the guidelines of classic GTM. We select the relevant literature on success of mobile apps and games only after we developed our model (Figure 1) based on concepts emerging from the empirical data (see e.g. Glaser, 1992). In other words, we do not impose the existing literature on our data analysis, and the constructs of the model emerged genuinely from the conceptualization of the empirical data (e.g. see Urquhart, Lehmann and Myers, 2010). Subsequently, we use the literature to juxtapose our findings with earlier research.

2.1   Success of mobile apps

Researchers have considered several measures of success for mobile apps, including volume of download (e.g. Liu, Au and Choi, 2014), revenue (e.g. Davis, Muzyrya and Yin, 2014), and average star-rating by users (e.g. Liu et al., 2014), either separately or in combination. These measures have been treated as dependent and/or independent variables in extant research. Findings of these studies show a positive relationship between user ratings and number of ratings with download volume (Song, Park and Kim, 2013), a negative effect of price and positive effect of ranking list position on download volume (Garg and Telang, 2013), and a positive effect of regular updates, placing in less popular categories, and high volume of user reviews on sustainable positioning of an app on top grossing ranking lists (Lee and Raghu, 2014).

Specifically, for mobile games, success measures used in earlier studies include the abovementioned ones, as well as the continued use. Following that research has established a positive relationship between continued use and enjoyment with hedonic systems (van der Heijden, 2004), factors affecting the enjoyment are deemed crucial for the success of a game. Identified factors include, for example, game design attributes (e.g. aesthetics, content, ease of use, novelty), social attributes (e.g. social norms, connecting to peers and reputation), and use context (e.g. place of use, mobility) (e.g. Merikivi et al., 2017; Hsu and Lu, 2004; Hamari and Järvinen, 2011). Consequently, we argue that download and continued use of a mobile game (which we refer to as *user engagement*) are strongly influenced by its visibility and quality (Liu et al., 2014; Garg and Telang, 2013) as well as the social attributes created by the existence of other players (Tang 2017; Yi et al. 2017). We will explain the concepts of visibility, quality, social attributes, and user engagement in the following.

2.2   Visibility

Developers aim at gaining a high position in ranking lists (Bresnahan et al., 2015) for better visibility of their apps (Bergvall-Kåreborn and Howcroft, 2011). Factors such as price, reviews, app size, and number of developed apps by a developer influence the ranking position of an app (Jung, Baek and Lee, 2012; Lee and Raghu, 2014). However, the algorithms used to generate the ranking lists are not officially revealed by any of the platform owners.

Visibility of apps in terms of the ranking positions and the different causal factors that affect them have been studied before, but the impact of developers' voluntary actions in increasing visibility has received less attention. Ghazawneh (2016) highlights the importance of marketing in the presence of increased competition and Bergvall-Kåreborn and Howcroft (2011) include marketing among the most important responsibilities of the app developers. Qiu et al. (2017) find that Apple App Store developers often partner with their peer-developers with popular apps in an attempt to market their apps at the release time.

2.3   Quality

The concept of app quality is not comprehensively defined in the existing literature. This may be due to the widely accepted notion of quality in traditional IS research focusing on system quality and content quality of an IS system (e.g. DeLone and McLean's IS success model (DeLone and McLean, 2003)). Nevertheless, in the context of mobile apps, earlier research has acknowledged the importance of the user-generated reviews and ratings. Users' reviews and star-ratings can be seen to reflect app quality and they can assist potential users in their evaluations of the apps (e.g. Li, Goh and Cavusoglu, 2013; Davis et al., 2014). The significance of user reviews indicates that the quality of an app is not defined only by its technical quality but is, in fact, described through the users' perceptions of quality. Furthermore, as the app markets allow updates of the apps as well as purchase of in-app items in freemium apps (i.e. where the app can be used for free but users can purchase additional features inside the app), the app markets are increasingly service oriented (Hamari and Järvinen, 2011; Hamari, 2015). Consequently, following Hamari, Hanner and Koivisto (2017), it is arguable that *service* quality measures, rather than *product* quality measures, should be considered to understand the construct of quality in mobile games.

SERVQUAL as a service quality measure (Parasuraman, Zeithaml and Berry, 1988) offers an extensive definition that addresses both technical and market related factors. With SERVQUAL, the quality of a game (conceptualized as a service) can be assessed in five areas: tangible features of the game (i.e. game content, visuals, audio), its ability to create empathy with the users (i.e. in-app-purchase items), the ways to assure the developer's trustworthiness, developer's responsiveness toward the users, and technical reliability of the game (Hamari et al., 2017). These measures are about the customers' perceptions of quality, which is defined as the comparison of the perceived quality with the expectations, and is different from objective quality (Parasuraman et al., 1988). Considering that in the mobile app context quality is eventually reflected through the users' reviews and star-ratings, using SERVQUAL measure is justified.

2.4   Social attributes

Social attributes are found to be important for success of games. In a study of Pokémon GO (an augmented reality mobile game), Tang (2017) finds different nostalgic, novel, and social attributes of the game to have contributed to its success. Similarly, Yi et al. (2017) find the influence of social factors in terms of how connecting a game to mobile messenger increased the prospect of remaining on the top position of ranking lists. In developing the game artifact, various ways to increase social interactions are among the tangible components designed in the game. Through social media, for example, developers can increase the communication and competition among the existing users or between the existing and potential users.

In addition, increase in the number of users and their engagement with the game creates positive network effects and the virtuous circle of getting more visibility in two ways: 1) the larger number of downloads increases the chance of reaching a top ranking position (Bergvall-Kåreborn and Howcroft, 2011), and 2) the users' positive reviews and star-ratings as well as creation of word-of-mouth can attract more users to the game (Liang, Li, Yang and Wang, 2016).

2.5   User engagement

User engagement as a construct has been used in the context of games to refer to either the point of making the initial decision to play a game, or the process of immersing in the game during gameplay (Li, Jiang, Tan and Wei, 2014). We consider both of these in our definition by following O'Brien and Toms (2008) in deconstructing the user engagement into four phases: point of engagement, period of engagement, disengagement, and reengagement. Given that mobile games are commonly played in short sessions while on the move or while doing other things at the same time in short (Merikivi et al.,2017) and the user might have to interrupt playing (Liu and Li, 2011), we consider the period of engagement to last as long as the user keeps returning to the game, even after interruptions. Therefore,

engagement process with mobile games comprises of the point of downloading the game (point of engagement), playing the game even with interruptions (period of engagement and reengagement), and finally fully stopping playing the game (complete disengagement). Consequently, the engagement ends when the player does not play the game anymore and may even uninstall it.

3   Research Setting and Methods

This study is comprised of data from interviews with 20 international mobile game startups (named alphabetically) working on their first commercial games. The startups were participating in AppCampus; a seed-accelerator program partnered by Microsoft (and formerly Nokia) and Aalto University in Finland for funding and training Windows Phone app developers. AppCampus operated during May 2012-2015, and funded over 300 apps in exchange for 90 days exclusivity period on Windows Store. In addition to receiving funding, 160 startups (in eight batches) with most promising apps were invited to participate in a two-week training and mentoring program (called AppCademy). After graduation from the program, startups received support from AppCampus through being promoted in its channels and connecting with peer-startups via the alumni network.

The first author conducted the semi-structured interviews, observed most of AppCademy training sessions, and interacted with the participants and the staff to better understand the startups' world. Each interview lasted between 30 to 60 minutes, and was recorded, transcribed and followed by field notes. Interview themes covered topics related to startup's background (team, experiences, and roles), previous and in-developing apps (description, target audience, revenue model, success definition), and the interaction of the teams with AppCampus (experiences, learning). The interviewees were all founders of the startups, except for two cases where the project leader and designer and the business developer were interviewed. However, both these interviewees had been with their respective startups since early on and were informative about the startups' plans and activities. Following Churchill and Lewis (1983), the interviewees who had investing themselves into the business in its early stage (Cope, 2003) were considered as prime representatives of their startups.

We followed the classic GTM in both data analysis and theorizing with three coding phases: open, selective, and theoretical (Glaser, 1992). We ensured that each concept genuinely arose from the data (e.g. ibid). Saturation of findings was reached with 20 interviews, after which we started to see "similar instances over and over again" (Glaser and Strauss, 1967, p. 61). In open coding, we assigned codes to the excerpts of data with the guiding questions defined by Glaser (1978, p. 57): 1) What are these codes a study of? 2) What category does this incident indicate? 3) What is actually happening in the data? This phase resulted in 245 open codes that we then grouped into 11 selective codes (Glaser, 1992). Next, we began theoretical coding by drawing the relationships between the selective codes (e.g. Glaser, 1992; 1978). This resulted in two emergent core categories: 1) Utilizing the accelerator's facilities (comprised of six selective codes and their relationships) and 2) Excelling in the market (comprised of five selective codes and their relationships). (For more details see the Appendix)

We then moved to higher level analysis and theorizing by drawing the fundamental relationships between the two core categories to better understand how the startups were attempting to succeed with their games. To integrate our data and theorize, we followed Glaser (1978, p. 81) by relating the categories to create our core theme in the form of a 'model' called 'Dynamics of Success for Early-Stage Mobile Game Startups' (Figure 1).

4   Findings

Our findings show how the startups worked toward achieving success, which they defined in terms of a large number of downloads and continued use. Early success was seen as a necessary first step toward a successful business, before expanding their business to new markets and new games. We found that by *utilizing the accelerator's facilities* (our first category) and the *available resources*, startups worked in developing good *quality* games in terms of technical reliability and market appeal. They also attempted to increase their own impact on the *visibility* of their game in the market rather than

leaving it up to uncontrollable external factors, such as a random chance to be featured on the store as decided by the platform owner or being promoted without the developer's influence. Building on both the *visibility* and the *quality* of their apps, startups tried to attract and retain a large number of *engaged users* to encourage positive word-of-mouth and favorable user reviews. (c.f. Roshan, Hekkala and Tuunainen, 2018.)

In addition, to cope with resource scarcity, most of the startups in our study applied an evolutionary approach to *excel in the market* (our second category). To increase *user engagement,* they worked on gradually improving the *quality* of their games in terms of enriching the game content and customizing them for different geographical markets. Game analytics as well as user reviews were used to monitor the performance of the games. (c.f. Roshan, Tuunainen and Hekkala, 2019.)

We have conceptualized our findings considering the constructs and their relationships in Figure 1. Following the GTM, the constructs of the model emerged directly from the empirical data without any preconceptions. Our model is dynamic by nature, indicating how startups work continuously and in iterations utilizing the resources and social interactions on the platform. Three inter-related requirements of *visibility*, *quality* and *user engagement* have an impact on the success of the startup's first game, enabling future offering of games and markets on other platforms.
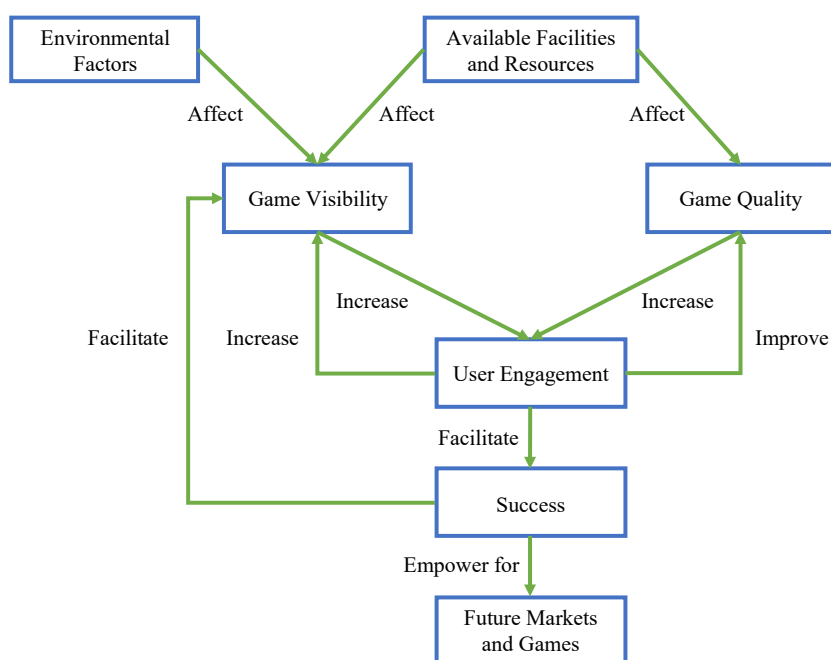

Figure 1.   *Model of Dynamics of Success for Early-stage Mobile Game Startups.*

Next, we provide evidence from the empirical data to illustrate and justify the constructs in our model.

4.1   Available resources and facilities

We found that startups faced two main challenges in developing and publishing their games: 1) Scarce financial resources, and 2) Lack of knowledge about business related issues of game development and publishing. One startup founder (H) talked about his failure in getting download for his previous game: *"I think the fault was with me, I did not know how to promote the game. I didn't know how to get downloads and how to monetize the game."* Another interviewee (D), mentioned their contentment with the accelerator for the funding: *"There's of course the money, which is nice to have"*. In addition to their own team capabilities, the startups tried to cope with these challenges by exploiting the resources that were available to them at a low cost (e.g. interns, friends, family members), used outsourcing to alleviate the lack of required expertise, and exploited free channels (e.g. exhibitions) for publicity, knowledge and feedback about their games.

4.2 Quality

Startups could increase their resource base by utilizing the accelerator's facilities including seed funding, networking opportunities and training. This was clearly reflected in improved quality of the developed games. As a result of the funding, the startups had a higher risk threshold and could experiment more innovatively in terms of market (e.g. new revenue model) as well as game concepts and technologies. For example, a startup founder (C) mentioned how the accelerator seed funding motivated them to try a new category of games: *"We're trying to find a new way of storytelling, so this is the experimental game and hopefully we can build other games so we can monetize with less of the idealistic artist driving it in the future."*

Furthermore, AppCademy program funding and both formal and informal training by mentors and peers helped the startups in developing higher quality games in terms of market appeal, and the quality assurance process helped in terms of technical design. Startup founder (X) explained the effect of the accelerator support on their game quality: *"[The funding] helped us to spend that extra time we needed on the game, so we give a quality. They [i.e. AppCampus] helped us in every aspect, so really really this is the best thing"*. Another startup founder (Q), mentioned the impact of peers' feedback on improvement of the game: *"This is the best thing of having 27 persons around the world here in this space. Then this is the good part because you by yourself ask everyone about your game and ask what they like and don't like and then you take notes and improve it."* Moreover, the direct effect of the accelerator's quality assurance review on the technical game quality was highlighted by our interviewees. Startup founder (U) shared his positive opinion of the review: *"[QA team] pointed out things that I have not noticed or thought it's not important, but actually it was important; when you see the end result, it's much better than before"*.

4.3 Visibility and environmental factors

In addition to the quality related issues, participation in the accelerator program helped the startups in their market-related activities by providing them with training on marketing strategies. AppCampus also provided them with contacts to market promoters and the platform owner to negotiate getting featured on the store in their desired market territory and point of time. Furthermore, the games of the participating startups were also directly promoted by the accelerator through different channels, including its own website, social media, and exhibitions. Receiving promotional vouchers (to be spent on buying cross-promotional services) and contacts with promoter services, startups could get more support for their marketing activities. Startup (X) mentioned how they used the promotional vouchers offered to them: *"it actually was good. And also, I spent all my points in [a cross promotional platform]"*.

Startups highlighted the benefits of being in the accelerator program and how it had offered them the opportunity to negotiate with the platform's decision makers about featuring their games. Startup founder (H) explained: *"There is a section in the store, the featured games, so if we can contact someone from the side, which games will feature that week, that day, we can get that spot."*

While trying to increase the visibility of their games by negotiating with the platform owner, the startups were also aware of the uncontrollable factors based on serendipity that could affect the visibility of their games. Startup founder (O) shared a story of being fortuitous with the timing of a user review which escalated to more reviews by others: *"Windows Phone Central reviewed our game on Friday night, so we're still on the front page for the whole Weekend; so that was great, and actually we got reviews from all over the World."*

4.4 User engagement

Startups aimed at receiving high star-ratings and favorable reviews from users in order to get a better position in the market. Acknowledging the importance of knowing users' opinions about the game, they carefully considered all the available user feedback received from the app store, their communication channels with the users (e.g. social media), and the designed in-game help buttons (a way to cir-

cumvent the platform's design limitation in making direct contact with individual users). Startup founder (H) explained the importance of ratings and their efforts to receive ratings and good reviews from *satisfied* users: *"If I want more people to download my game I need to be up [in the ranking list][...] There is this [rating requesting tool] and it shows after the fifth session, because if the player doesn't like the game he won't reach five sessions. We don't want bad reviews, so we take reviews from people that actually play the game."* Furthermore, the startups recognized the importance of reviews in attracting potential users. Startup founder (X) mused on the psychological effect of reviews on potential users: *"It's very important, it's psychological effect. When you see the game, many stars from lots of people, you feel like, there can't be everybody wrong, right? Also, if you see really bad reviews, why should I play a game that has bad reviews."* The startups were constantly improving their games in order to receive high star-ratings and positive reviews from their users. They attempted to capitalize on the number of satisfied users to build a positive reputation and to be more competitive in the future. Startup founder (M) talked about their objective of brand building for their game: *"We just want to increase our brand awareness in windows phone for then releasing future games"*.

Previous experiences had taught the founders that their perceptions of the game performance in the market was not always supported by the actual performance and sometimes they had missed monetization opportunities or had overly invested their resources on a wrong business model. For instance, startup founder (N) explained his surprise and regret of missing a chance to monetize a game which happened to receive a large volume of downloads *"I didn't expect for anything about it, then I just went, 'Oh my God, so many downloads. I could have put some ads in there and make some bucks.'"* The startups learned that they could follow an evolutionary approach in the market. Startup founder (W) mentioned: *"We realized that we need to experiment with business model, because you never know what works better for you."*

Taking an iterative approach and collecting data by monitoring the game after its release helped the startups to gain insight about the game performance. As explained by startup founder (J), using game analytics could be a guiding tool in making improvements to the game after its launch: *"[Our developer] made his own tools. Everything you touch [in the game] he picks it up, [...] I assume that people don't just go because they didn't understand something. I know they don't understand it because they write it in the review. I put them all together [with analytics]. So now I'm changing the whole process of learning."* Besides in helping in adapting the game to the users' behaviors, iterative approach assisted the startups in managing their resources in terms of gradual enrichment of the game through content, monetization and localization. Launching globally at first and monitoring the performance with game analytics as well as users' reviews helped them to find potential markets to localize the games for. Startup founder (H) explained that users' reviews guided them towards localizing for a specific market: *"The languages I'm going to go is Spanish and French. I get many good reviews from the French, they really like it."* Startup founder (X) explained how they wanted to add content (new game levels) and monetization in the game, *"We should focus more on producing content, because now it's [i.e. the game is] kind of small, I feel people get bored after time [...] freemium conversion is also small, because we didn't really focus on that. We are going to change this now."*

4.5 Success and future goals

Startups defined the success of their current game in terms of large volume of downloads, which they hoped to be able to leverage in the future in terms of monetization and reputation. Startup founder (B) explained the difference between their envisioned success measures in the current versus future platforms: *"Let's say that 150,000 downloads for Windows Phone. We could say in that side it's successful, and within other platforms, let's say revenue of more than €50,000 would be like successful, because it's our first commercial game"*. To attract users, most startups offered their games as freemium games that allowed the users to finish the game freely, but also encouraged them to expedite their progress and/or customize the game by purchasing virtual items. Startup founder (P) explained the negative effect of having to pay for a game on users' interests: *"I've been going to these game conferences, and I've been showing the game. Everybody there, they like how it looks. Once you say we are plan-*

ning to go premium, that's when the interest stops". Accordingly, while some startups considered in-app-purchase mechanisms for their games, they all considered it important that the users would be able to finish the game without any payment if they wanted to do so. Startup founder (J) elaborated: *"Now we're putting in-app-purchasing, so you can buy, you're going to buy time, you're going to buy cards. If you want tournaments you'll go and pay."* However, it was noted by the interviewees that in freemium games, the monetizing mechanism needed to be already designed in the game concept, otherwise it would be too difficult to change the game to freemium model later. Startup founder (E) expressed their dissatisfaction of being advised to change the game to freemium after it had been designed as a paid game: *"We decided the game other ways, so it's now hard to get the idea how we do that."*

All startups had plans to target multiple platforms after the exclusivity period. They all had developed their games in the environments that would allow easy porting to other platforms, and they did not expect any technological challenges in doing so after the 90-day exclusivity period. Their objective was to polish the game to receive a large volume of downloads and to build a reputation before entering the more competitive platforms. Startup founder (A) shared their plan: *"I think once we're like, 'This game is now really [good and], we feel really good about this [and] we think we've got everything in that we want to get in,' at that point, we would look at iOS and Android launch"*.

5 Discussion

Our findings confirm how the early-stage startups develop their business by focusing in mobilizing a large number of engaged users at the cost of delaying monetization (Bergvall-Kåreborn and Howcroft, 2013). In line with the findings of Li et al. (2013) but contrary to suggestion of Davis et al. (2014), our findings show that because of the very limited resources, the early-stage startups were focusing only on one game. Instead of having a portfolio of multiple games to check which one succeeds (cf. Davis et al., 2014), the startups aimed at making the first game successful through sequential improvements. They worked in an iterative manner while assessing the performance of their games, and gradually shifted focus to the potential issues that could lead to success. At the same time, they worked on developing social interactions with other market actors, including peer-developers, users and other influencers, in order to create added value (Lusch and Nambisan, 2015). With this, the startups created their way of doing business with an iterative approach to keep up with the market expectations (Ojala, 2015).

Startups' considered all aspects of service quality (SERVQUAL) in their game service offering at all stages of the game design and development, release and further improvements. Participation in the accelerator helped the startups to increase the *quality* of their game service in all measures of SERVQUAL except *responsiveness*, which was in fact restricted by the platform structure. The startups took advantage of the cultural capital (i.e. certain norms and values and methodologies for being an startup) (Haines, 2014) in the accelerator program by sharing knowledge with peer-startups (Qiu et al., 2017) and by validating their games with market experts and mentors (Dempwolf, Auer and D'Ippolito, 2014). This, along with the seed-funding received from the accelerator allowed improvement of *tangible* features of the game, such as the aesthetics, content, novelty, monetization mechanisms, and implementation of social features in the game design. They could enhance the *reliability* of their games in terms of compatibility with the platform standards and users' devices through the accelerator's quality assurance process before publishing their game. The direct promotion of the games by the accelerator via their online and offline channels, securing that the games were in line with platform requirements (Ghazawneh and Henfridsson, 2010) together with the accelerator's support could increase the *assurance* in credibility of the game for the members of the ecosystem such as promoters, publishers and users (Miller and Bound, 2011). In addition, through adding well-designed in-app-purchase mechanisms in the games, gradual expansion to new markets, and improvements of the game and further customization, startups could create more *empathy* with their users. However, the *responsiveness* of startups was limited by the platform structure by not allowing them to directly contact the users providing reviews, as observed in other platforms too (Qiu et al., 2017). Many startups overcame this

problem by designing a contact button inside the game for interested users, and by using social media with company and dedicated game pages to communicate directly with users.

In order to enhance their chances of getting downloads, the startups strived constantly at increasing the *visibility* of their games and their companies in the market through the networks they in the accelerator (e.g. Garg and Telang, 2013). Being aware of the uncontrollable factors on visibility of the game, they sought ways to overcome the limitations and ineffectiveness of the ranking lists (Bresnahan et al., 2014; Bergvall-Kåreborn and Howcroft, 2013) by negotiating with the promoters the time and place of getting featured.

Through working on *quality* and *visibility*, the startups aimed to increase the *user engagement* for their games addressing both the *point* and *period* of engagement (O'Brien and Toms, 2008). The efforts put on the visibility and quality of the data shown on the store (e.g. icon, description, languages) were meant to affect the point of engagement (e.g. Lee and Raghu, 2011). In the hope of receiving positive reviews, the startups requested reviews from the users at specific times. Considering the users' reliance on peer reviews (e.g. ibid), this was seen as a way to increase the motivation and interest of potential users to download the game (O'Brien and Toms, 2008). To prolong the period of engagement, startups were constantly working on *tangible* and *empathy* measures by enriching the game content and raising its quality according to the games' performance data.

Naturally, in line with existing literature on the significance of releasing sufficiently polished games (Yin et al., 2014) with adequate features (Qiu et al., 2017), startups tried to offer games with no technical problems (*reliability* in SERVQUAL). Considering the need for games to take off fast upon their release (Yi et al., 2017; Bergvall-Kåreborn and Howcroft, 2013), we argue that the concept of MVP in mobile games needs to be considered cautiously by startups; the first version of the game artefact needs to be of sufficient quality to attract and also lock-in users for adequate amount of time to allow for further enrichment of the game based on market data. As our findings show, the future improvements of the game were mainly related to creating more *empathy* with game users to increase the period of engagement for existing users or both period and point of engagement in new markets (e.g. through customization of the game).

Considering the dynamic nature of the model and the role of startups in enhancing each requirements of success (i.e. visibility, quality and user engagement) and their relationships, the creation of *social* interactions with the actors of the platform ecosystems plays an important role in how startups meet each of the requirements and leverage the dynamics among them. In other words, the startups enhance their game visibility, quality, and user engagement and create value through benefiting from the actor-to-actor relationships that exist in the platform networks (Lusch and Nambisan, 2015). They increase the quality of game (as described above) through the social interactions with accelerator enabled means (e.g. peer-startups, mentors, seed-funding, etc.) and game users' data and feedbacks collected from the market (e.g. monitoring the game, reviews, social media). They increase their control on the visibility of the game through social interactions with the platform owner and other influencing actors of the ecosystem. Finally, they increase the user engagement through implementing social interactions among both existing and potential users in the game design and on social media. Through using the social interactions among various actors of the platform ecosystem to improve each of the requirements, startups aim to achieve success with their first game in building a user mass and a reputation, and leverage on it to enter their future platforms of choice and offer future games. In line with Standing and Mattsson's (2016) argument that besides technical expertise, knowledge of the digital business environment is important in defining a right business model, we conclude that utilizing the *social aspects* of mobile platforms and co-creating value with other actors - from platform owner to peer-startups to users - are essential for startups in overcoming the limitations of the market structure and meeting the requirements of success in terms of game visibility, quality and user-engagement.

While the issue of value co-creation is extensively discussed in service innovation systems (Lusch and Nambisan, 2015), in case of mobile app developers, it has been addressed only among the community of developers of apps, between developers and users in the design phase (e.g. Qiu et al., 2017) and between developers and other digital service providers (such as API providers) (Eaton, Elaluf-

Calderwood, Sørensen and Yoo, 2015). Our contribution to this line of research is in providing a more holistic view of how startups benefit from the social relations with *all* members of the ecosystem including developers, users, promoters and platform owners and how startups can co-create value with them to succeed in the market. We extent the findings of Vanhala and Saarikallio (2015) in highlighting the importance of human capital (i.e. the developers and the users in their study) in the business model of game developers by broadening the scale to include the human capital that exists in the *entire* ecosystem to be leveraged to increase the chance of success.

6   Conclusion

This grounded theory study answers to our research question of "What factors contribute to early-stage mobile game startups' success toward future expansion of business?" with a theoretical model that describes the focus of startups on three requirements of quality, visibility, and user engagement for succeeding in the app market and their attempt to enhance each of these requirements and the dynamics among them through leveraging the social relationships with other members of the ecosystem. Our study contributes to the existing literature on mobile app development and the interactions of the startups with the platform owner, users, and their games artefact (e.g. see Qiu et al., 2017) in developing a successful game and business. A particularly novel aspect of our findings is how startups leverage on the social interactions with all other actors of the ecosystem in their game development activities toward success. Our study also contributes to the body of knowledge on creation of a viable business in startups (e.g. Ojala, 2015; Standing and Mattsson, 2016) by explaining the requirements that mobile game startups consider in order to succeed and their attempts to benefit from the social relationships in their business context.

Our study has some limitations. Our findings are derived from empirical evidence from early-stage mobile game startups; therefore, we cannot generalize our model to other context with other category of apps or more established startups. However, built through GTM, the theoretical model benefits from having a modifiable nature when new data appears (Glaser, 1978, pp. 4-6). Future research can utilize this model in other contexts to see if developers follow the same dynamics, for example in more established startups, more competitive platforms, and/or in other category of apps. Furthermore, our startups were participating in an accelerator program. We argue that this does not affect our findings at large in terms of the main requirements (i.e. visibility, quality and user engagement) and the importance of enhancing them through social interactions. However, startups can (and do) compensate for the lack of accelerator's resources in alternative ways. Examining our findings in the context where an accelerator is not involved can provide new insights on how startups work to build the social relations with the ecosystem actors and how they compensate for their lack of resources in enhancing each of the requirements. Furthermore, Windows Phone platform has practically stopped working by now, but the findings of our study can still benefit us in understanding the early-stage developers' activities on mobile platforms in current or future platforms.

References

Abrahamsson, P., A. Nguyen-duc, G. H. Baltes, K. Conboy, D. Dennehy, R. Sweetman, … F. Kon (2016). "Software Startups - A Research Agenda." *E-Informatica Software Engineering Journal* 10 (1), 1–28.

Amit, R. and C. Zott (2001) "Value Creation in E-Business." *Strategic Management Journal* 22 (6-7), 493–520.

Bergvall-Kåreborn, B. and D. Howcroft (2011). "Mobile Applications Development on Apple and Google Platforms." *Communications of the Association for Information Systems* 29 (1), 565–580.

Bergvall-Kåreborn, B. and D. Howcroft (2013). "The Apple Business Model: Crowdsourcing Mobile Applications." *Accounting Forum* 37 (4), 280–289.

Bergvall-Kåreborn, B. and D. Howcroft (2014). "Persistent Problems and Practices in Information Systems Development: A Study of Mobile Applications Development and Distribution." *Infor-*

mation Systems Journal 24 (5), 425–444.

Bharadwaj, A., O. A. El Sawy, P. A. Pavlou and N. Venkatraman (2013). "Digital Business Strategy: Toward a Next Generation of Insights." *MIS Quarterly* 37 (2), 471–482.

Bosch, J. (2012). "Building Products as Innovation Experiment Systems." In: *International Conference of Software Business*. Springer, Berlin, Heidelberg, (pp. 27-39).

Bresnahan, T. F., J. P. Davis and P. Yin (2015). "Economic Value Creation in Mobile Applications." In: *The Changing Frontier: Rethinking Science and Innovation Policy.* Ed. by A. B. Jaffe & B. F. Jones, University of Chicago Press. (pp. 233–286).

Bresnahan, T., J. Orsini and P.-L. Yin (2014). *Platform Choice By Mobile Apps Developers*. Working paper. National Bureau of Economic Research. Cambridge, MA.

Churchill, N. C. and V. L. Lewis (1983). "The Five Stages of Small Business Growth." *Harward Business Reveiw* 61 (3), 30–50.

Cohen, S. (2013). "What Do Accelerators Do? Insights from Incubators and Angels." *Innovations* 8 (3/4), 19–25.

Cope, J. (2003). "Entrepreneurial Learning and Critical Reflection: Discontinuous Events as Triggers for "Higher-level" Learning." *Management Learning* 34 (4), 429–450.

Davis, J. P., Y. Muzyrya and P. Yin (2014). *Experimentation Strategies and Entrepreneurial Innovation: Inherited Market Differences in the iPhone Ecosystem*. SIEPR Discussion Paper No. 13-029. Stanford University for Economic policy Research.

DeLone, W. H. and E. R. McLean (2003). "The DeLone and McLean Model of Information Systems Success." *Journal of Management Information Systems* 19 (4), 9–30.

Dempwolf, C. S., J. Auer and M. D'Ippolito (2014). "Innovation Accelerators: Defining Characteristics Among Startup Assistance Organizations." *Small Business Administration* (October), 1–44.

Eaton, B., S. Elaluf-Calderwood, C. Sørensen and Y. Yoo (2015). "Distributed Tuning of Boundary Resources: The Case of Apple's iOS Service Systems." *MIS Quarterly* 39 (1), 217–243.

Garg, R. and R. Telang (2013). "Inferring App Demand From Publicly Available Data." *MIS Quarterly*, 37 (4), 1253–1264.

Ghazawneh, A. (2016). "The Challenges of Designing Digital Services for Multiple Mobile Platforms." In: *Twenty-Fourth European Conference on Information Systems.* İstanbul:Turkey. Research Papers. 105.

Ghazawneh, A. and O. Henfridsson (2010). "Governing Third-Party Development through Platform Boundary Resources." In: *Thirty First International Conference on Information Systems. Proceedings.* St. Louis: USA. Paper 48.

Glaser, B. G. (1978). *Theoretical Sensitivity: Advances in the Methodology of Grounded Theory*. 1st Edition. Mill Valley, California: The sociology Press.

Glaser, B. G. (1992). *Basics of Grounded Theory Analysis: Emergence Vs. Forcing*. Mill Valley, California: The sociology Press.

Glaser, B. G. and A. L. Strauss (1967). *The Discovery of Grounded Theory: Strategies for Qualitative Research*. New York: Aldine Publishing Company.

Haines, J. K. (2014). "Iterating an Innovation Model: Challenges and Opportunities in Adapting Accelerator Practices in Evolving Ecosystems." In: *Ethnographic Praxis in Industry Conference Proceedings.* New York, USA: 282–295.

Hamari, J. (2015). "Why Do People Buy Virtual Goods? Attitude Toward Virtual Good Purchases Versus Game Enjoyment." *International Journal of Information Management* 35 (3), 299–308.

Hamari, J., N. Hanner and J. Koivisto (2017). "Service Quality Explains Why People Use Freemium Services but not If They Go Premium: An Empirical Study in Free-to-play Games." *International Journal of Information Management* 37 (1), 1449–1459.

Hamari, J. and A. Järvinen (2011). "Building Customer Relationship through Game Mechanics in Social Games." In: *Business, Technological and Social Dimensions of Computer Games: Multidisciplinary Developments*. Ed. by M. Cruz-Cunha, V. Carvalho, & P. Tavares. IGI Global. Hershey, PA.

Hsu, C.-L. and H.-P. Lu (2004). "Why Do People Play On-line Games? An Extended TAM with Social Influences and Flow Experience." *Information and Management* 41 (7), 853–868.

Jung, E. Y., C. Baek and J. D. Lee (2012). "Product Survival Analysis for the App Store." *Marketing Letters* 23 (4), 929–941.

Lee, G. and T. S. Raghu (2011). "Product Portfolio and Mobile Apps Success: Evidence from App Store Market." In: *Proceedings of the Seventeenth Americas Conference on Information Systems* Detroit, Michigan, USA: p. 444.

Lee, G. and T. S. Raghu (2014). "Determinants of Mobile Apps' Success: Evidence from the App Store Market." *Journal of Management Information Systems* 31 (2), 133–170.

Li, M., K. Y. Goh and H. Cavusoglu (2013). "Mobile App Portfolio Management and Developers' Performance: An Empirical Study of the Apple iOS Platform." In: *Thirty Fourth International Conference on Information Systems.* Milan: Italy.

Li, M., Q. Jiang, C.-H. Tan and K. Wei (2014). "Enhancing User-Game Engagement Through Software Gaming Elements." *Journal of Management Information Systems* 30 (4), 115–149.

Liang, T.-P., X. Li, C.-T. Yang and M. Wang (2016). "What in Consumer Reviews Affects the Sales of Mobile Apps: A Multifacet Sentiment Analysis Approach." *International Journal of Electronic Commerce* 20 (2), 236–260.

Liu, C. Z., Y. A. Au and H. S. Choi (2014). "Effects of Freemium Strategy in the Mobile App Market: An Empirical Study of Google Play." *Journal of Management Information Systems* 31 (3), 326–354.

Liu, Y. and H. Li (2011). "Exploring the Impact of Use Context on Mobile Hedonic Services Adoption: An Empirical Study on Mobile Gaming in China." *Computers in Human Behavior*, 27 890–898.

Lusch, R. F. and S. Nambisan (2015). "Service Innovation: A service-dominant logic perspective." *MIS Quarterly*, 39 (1), 155–175.

Merikivi, J., V. Tuunainen and D. Nguyen (2017). "What Makes Continued Mobile Gaming Enjoyable?" *Computers in Human Behavior* 68 (March 2017), 411–421.

Miller, P. and K. Bound (2011). "The Startup Factories." Disscussion Paper. NESTA.

O'Brien, H. L. and E. G. Toms (2008). "What is User Engagement? A Conceptual Framework for Defining User Engagement with Technology." *Journal of the American Society for Information Science and Technology* 59 (6), 938–955.

Ojala, A. (2015). "Business Models and Opportunity Creation: How IT Entrepreneurs Create and Develop Business Models under Uncertainty." *Information Systems Journal* 25 (5), 451–476.

Okazaki, S., R. Skapa and I. Grande (2008). "Capturing Global Youth: Mobile Gaming in the U.S., Spain, and the Czech Republic." *Journal of Computer-Mediated Communication* 13 (4), 827–855.

Parasuraman, A., V. A. Zeithaml and L. L. Berry (1988). "SERVQUAL: A Multiple-Item Scale For Measuring Consumer Perceptions of Service Quality." *Journal of Retailing* 64 (1), 12-40.

Paternoster, N., C. Giardino, M. Unterkalmsteiner, T. Gorschek and P. Abrahamsson (2014). "Software Development in Startup Companies: A Systematic Mapping Study." *Information and Software Technology* 56 (10), 1200–1218.

Qiu, Y., A. Gopal and I.-H. Hann (2017). "Logic Pluralism in Mobile Platform Ecosystems: A Study of Indie App Developers on the iOS App Store." *Information Systems Research* 28 (2), 225-249.

Ries, E. (2011). *The Lean Startup: How Constant Innovation Creates Radically Successful Businesses.* London: Penguin Group.

Rochet, J. and J. Tirole (2003). "Platform Competition in Two-Sided Markets." *Journal of the European Economic Association* 1 (4), 990–1029.

Roshan, M., R. Hekkala and V. K. Tuunainen (2018). "Utilization of Accelerator Facilities in Mobile App Developer Startups." In: *Twenty-Sixth European Conference on Information Systems.* Portsmouth: UK.

Roshan, M., V. K. Tuunainen and R. Hekkala (2019). "How Mobile Game Startups Excel in the Market." In: *Hawaii International Conference on System Sciences.* Maui, Hawaii: USA.

Song, C., K. Park and B. C. Kim. (2013) "Impact of Online Reviews on Mobile App Sales: Open Versus Closed Platform Comparison." In: *Pacific Asia Conference on Information Systems*, Jeju Island: Korea.

Spiegel, O., P. Abbassi, M. P. Zylka, D. Schlagwein, K. Fischbach and D. Schoder (2016). "Business

Model Development, Founders' social Capital and the Success of Early Stage Internet Start-ups: A Mixed-Method Study." *Information Systems Journal* 26 (5), 421–449.

Standing, C. and J. Mattsson (2016). ""Fake it until you make it": business model conceptualization in digital entrepreneurship." *Journal of Strategic Marketing* 26 (5), 385-399.

Tang, A. K. Y. (2017). "Key Factors in the Triumph of Pokémon GO." *Business Horizons* 60 (5), 725–728.

Urquhart, C., H. Lehmann and M. D. Myers (2010). "Putting the "theory" back into grounded theory: Guidelines for grounded theory studies in information systems." *Information Systems Journal* 20 (4), 357–381.

van der Heijden, H. (2004). "User acceptance of hedonic information systems." *MIS Quarterly* 28 (4), 695–704.

Vanhala, E. and M. Saarikallio (2015). "Business Model Elements in Different Types of Organization in Software Business." *International Journal of Computer Information Systems and Industrial Management Applications* 7, 139–150.

Yi, J., Y. Lee and S. Kim (2017). "Determinants of Growth and Decline in Mobile Game Diffusion."
Journal of Business Research. DOI: https://doi.org/10.1016/j.jbusres.2017.09.045.

Yin, P.-L., J. P. Davis and Y. Muzyrya (2014). "Entrepreneurial Innovation: Killer Apps in the iPhone Ecosystem." *American Economic Review* 104 (5), 255–259.

Appendix

In Table 1, we illustrate the construction of our core categories through the selective and open codes. We have two core categories; 1) Utilizing the accelerator's facilities (containing 6 selective codes), 2) and excelling in the market (containing 5 selective codes).

Category	Selective Codes	Open Codes
Utilizing the Accelerator's Facilities	Startup's capabilities	Company profile; experience with game development; lacking business knowledge; lacking financial resources; reflecting own philosophy.
	Market-related activities	Using low cost marketing; focusing on downloads and building a reputation; getting featured to get downloads; expanding the market step-by-step; contacting users; using a publisher to launch games; making a portfolio.
	Experimenting activities	Soft-launching; experimenting with AppCampus game; experimenting with previous game.
	Resources	Exploiting team members capabilities; accessing low-cost resources.
	Game design activities	Differentiating the game; integrating social aspect in the game; Developing the game; avoiding complex game design; designing for monetization; caring to get user star ratings and reviews; paying attention to game quality.
	Accelerator's facilities	Getting invited by the platform owner; benefiting from funding; learning by AppCademy training; benefiting from networking in AppCademy; Building a relationship with platform owner; building a reputation by AppCampus.
Exceling in the Market	Monitoring activities	Focusing on analysis; Monitoring user's behavior in the game; Monitoring users' reviews
	Post-launch improvement activities	Improving the game after launch; multi-homing activities
	Insights on game performance	Getting insight into user's behavior in the game; getting surprised by download volume; regretting about past activities
	Success with the game	Defining success as download volume; defining success as revenue volume; defining success as self-achievement
	Restraints	Restraints by AppCampus; restraints by the platform; restraints by supporting tools

Table 1.   Construction of the core categories.

First core category: Utilizing the accelerator's facilities

Our first core category 'Utilizing the accelerator's facilities' comprises of six selective codes: 1) Startup's capabilities, 2) Market-related activities, 3) Experimenting activities, 4) Resources, 5) Game design activities, and 6) Accelerator's facilities. We found that startups faced two main challenges: scarce financial resources and lack of knowledge on business related issues of game development and publishing. The accelerator's facilities increased the resource base of the startups through providing them with seed funding, promotional vouchers, and contacts. More resources allowed the startups to invest more on their game design and improve their game quality and also to perform experimentation activates, such as implementing new innovations in terms of market (e.g. a new revenue model) or a game concept and technology (e.g. a new game mechanism or concept). Experimenting was a way to cope with lack of knowledge relating to startup's capability. Moreover, having more resources, startups could invest more on their market-related activities both financially and through new networks with promoters and peer-developers. Using more resources led to more dedication and time investment in game design activities. Additionally, the accelerator's facilities enhanced the startup's capabilities by trainings them for market-related activities, and game design activities as well as quality assurance of the game upon launch. In market-related activities startups could negotiate with the platform for featuring and other promotional activities. The accelerator's facilities also increased the startup's capability by providing legitimacy for the startups, which in turn helped the startups to acquire more resources from other ecosystem members. (For more details see Roshan et al., 2018.)

Second core category: Excelling in the market

Our second category 'Excelling in the Market' comprised of five selective codes: 1) Monitoring activities, 2) Post-launch improvement activities, 3) Insights on game performance, 4) Success, and 5) Restraints. The findings of our second category show the evolutionary approach taken by the startups in the market. The startups developed their games based on their team members' experience and understanding about game playing. Their expectations of their games' performance in the market and users' behavior were not necessarily supported by the actual performance and users' behaviors. They tended to launch their games, and monitor and collect data from actual users' behaviors by the help of both the game analytics and the users' reviews. Thus, they were monitoring their game performance addressing two objectives: 1) increasing user retention, 2) preparing the game for expanding to new geographical territories and/or platforms. They tried to increase user retention by working on the game and adding content gradually. Also, they aimed to expand the markets by localizing the game for markets with potential and polishing the game before entering more competitive markets. The limited resources of the startups forced them to only concentrate on one game in their early stage. Meanwhile the restraints imposed by the platform, accelerator, and/or analytical tools could hinder the activities of startups in improvements making them put extra effort to accomplish their goals. (For more details see Roshan et al., 2019.)