
Entrepreneurship in indie app development: A case study on a Vietnamese indie mobile developer

MSc program in Entrepreneurship and Innovation Management

Master's thesis

Mai Xuan Linh

2020

Department of Management Studies
Aalto University
School of Business

Abstract of master's thesis

Author Mai Xuan Linh

Title of thesis Entrepreneurship in indie app development: A case study on a Vietnamese indie mobile developer

Degree Master's Degree

Degree programme Entrepreneurship and Innovation Management

Thesis advisor(s) Kroeger Arne

Year of approval 2020

Number of pages 55

Language English

Abstract

This paper is a single case study aimed to explore the entrepreneurial process of a Vietnamese indie mobile developer in a real-life context during a three-year period. From the perspective of an insider, the researcher has kept track of the process through various observations, discourses and open interviews with this developer as well as through his personal narratives. By presenting and analysing this intensive case study with a narrative approach, the research sheds light on how a particular Vietnamese indie developer developed his projects and turned them into a promising source of income. The main focus of the study is to understand how an indie developer made a business from his apps, identify the challenges facing him, and the qualities he possesses in order to progress as a mobile application entrepreneur. This case study also contributes to a deeper understanding of technology entrepreneurship in a developing nation and makes way for further research into mobile application entrepreneurship.

Keywords: indie mobile developer, challenges, technology entrepreneurship, mobile app development, entrepreneurial process

Preface

I would like to thank the founder of Bro app studio - the main participant of this case study - for his valuable insights and cooperative efforts during the research process. I also would like to thank Dr. Arne Kroeger and Dr. Chliova Myrto for navigating me to the right path at the beginning stage and providing me with proper instruction along the way. I am really grateful for all these contributions because without them, this thesis would not arrive at this completion.

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1. Introduction

1.1. The research gap: The importance of studying indie app development

In recent years, the rapid expansion of the global mobile industry has made way for a new generation of mobile developers in Vietnam. While mobile developers are mostly employed full-time in technology companies to work in collaboration with other team members, a small percentage of them are independently creating and marketing their own apps in the stores. There are some underlying reasons why research into this type of developers will be meaningful:

First of all, independent development is a fundamental stage in the career path of many mobile developers. Regardless of their employment status later on (full-time employed or self-employed), mobile developers mostly experience a preliminary stage when they independently develop their products. This stage may be a period during which junior developers spend time sharpening their programming and marketing skills by creating some small apps and introducing their products on app stores. Other cases are senior, experienced developers who leave their jobs in companies to start building their own products. Some employed developers also create their indie games/apps in parallel with their current jobs to earn extra income. Given this fact, it can be said that indie development plays an important role in building up technical knowledge as well as business skills for a mobile developer. Understanding this process will contribute to a deeper understanding of technology entrepreneurship.

The second important motivation for this study is to provide more insights into indie mobile apps development as a means of creating income. While the mobile industry is often labelled as lucrative and profitable, it also comes with many challenges and difficulties, especially for those who create and sell indie products. Before reaching the point that the apps can generate actual profits, developers may encounter various obstacles, many of which may even discourage them to continue this career.

To put it simply, a closer approach towards this topic will be meaningful to those who are researching the field or planning to pursue this career path.

1.2. Research questions

As a single case study research, this paper does not target indie developers in general nor aim to build a generalised theory. Instead, I study a single instance (a particular individual in a particular national context, over a fixed period of time) and explore the idiosyncrasy of his entrepreneurial process. Specifically, I aim to find the answers to the three questions below:

- (1) How a Vietnamese indie mobile app developer made a business from his apps during the period from 2015 to 2019?*
- (2) What are the main challenges that this developer faced in his entrepreneurial process?*
- (3) What qualities made this indie developer progress as a mobile app entrepreneur?*

Because of this characteristics, my research adopts the type of intensive case study, which “aims at understanding a unique case from the inside by providing a thick, holistic and contextualized description” - Päivi Eriksson & Anne Kovalainen (2010)

1.3. Key definitions

1.3.1. What is “indie”?

According to Oxford Learner Dictionary, the word “indie” is an informal form of “independent”. As an adjective, it means “not belonging to, working for or produced by a large organization”

As stated in Urban Dictionary, “indie is any business or designer that is not associated with a large company. Indie can also define the consumer who chooses to support small business, independent record labels and handmade items rather than shopping at big-box stores.”

The two definitions above are general ways to understand the word “indie”. However, in the technology community, the term “indie” has a narrower shade of meaning. Robert Boyd, co-founder of the successful indie game studio behind breakout XBLIG hits *Breath of Death VII* and *Cthulhu Saves the World*, provides a concise definition: "An indie developer is an individual or small group that is not owned by another company that makes games. An indie game is a game made by an indie developer, simple as that."

Also, in a technology blog post, David Rosen considers “indies” to possess two key attributes:

- Motivated by passion, not money: Money is always a factor, but for indie developers it's an incidental logistical concern (i.e. the project can't continue if we starve to death), not the primary goal.
- Designed from the trenches: The developers in charge of the project's direction are also the ones doing the grunt work, such as programming and creating artwork.

In this thesis, the term “indie” thus implies the “independent” element which is characteristic of a group of developers who are making products by relying solely on their own funds.

1.3.2. App and Mobile app developers

In short, “a mobile application, also referred to as a mobile app or simply an app, is a computer program or software application designed to run on a mobile device” - Wikipedia
In this paper, the author defines “apps” as the broad term which encompasses all sub-categories such as productivity assistance programs, educational apps and mobile games. Accordingly, mobile app developers are programmers who create and develop such applications used in mobile devices such as smartphones, tablets or watches.

1.3.3. Entrepreneur and entrepreneurial process

Entrepreneurs: Although there have been various definitions of an entrepreneur, I

perceive an entrepreneur as a person who seeks for opportunities on the market and is ready to take risks in order to start a business in the hope of receiving financial profits.

Entrepreneurial process: This thesis adopts the definition of entrepreneurial process by William Bygrave, a professor at Babson College: “the entrepreneurial process is a set of stages and events that follow one another. These entrepreneurial process stages are: the idea or conception of the business, the event that triggers the operations, implementation and growth. A critical factor that drives the development of the business at each stage as with most human behaviour, entrepreneurial traits are shaped by personal attributes and environment”.



Figure 1. Five Stages of an entrepreneurial process

To apply these definitions into my research questions, mobile app entrepreneurs can be understood as people who realise an idea, an opportunity or a current need on the market and turn it into action by developing mobile applications that can generate profits. The entrepreneurial process of a mobile app entrepreneur consists of many stages: idea generation, development plan, implementation, growth and finally, management and harvesting.

2. Literature Review

The entrepreneurship of indie app development is a relatively new and narrow area within mobile app entrepreneurship, which, in turn, belongs to a broader field of research - Technology entrepreneurship. Hence, I highlight important documents relating to my research in a broad-to-specific order. First, I will summarise the key articles which have provided a general overview of technology entrepreneurship. In the second section, I will point out some emerging trends in the entrepreneurship of mobile app development before focusing on some notable articles on the specific topic of indie app development in section 2.3

2.1. Technology Entrepreneurship

Before diving deeper into the particular field of mobile entrepreneurship, it is essential to make sense of technology entrepreneurship in general. In this part, I will summarise the important paper of Tony Bailetti in 2012 and express my critical thinking about this work. Tony Bailetti proposed a definition of technology entrepreneurship, considering it as “an investment in a project that assembles and deploys specialized individuals and heterogeneous assets that are intricately related to advances in scientific and technological knowledge for the purpose of creating and capturing value for a firm.” This definition, according to Tony Bailetti, relies on four elements:

Ultimate outcomes: The two core outcomes of technology entrepreneurship are value creation and capture.

The target of the ultimate outcomes: The target of these outcomes is the firm because all value created and captured are targeted to the firm.

The mechanism used to deliver the ultimate outcomes: The investment in a project is the mechanism. A project includes the human resources and assets utilised to produce the ultimate outcomes.

The interdependence of this mechanism with scientific and technological advances: This is a crucial element of technology entrepreneurship: Individuals who launch an entrepreneurial project are driven by technological and scientific advances. A project in

technology entrepreneurship makes use of technological knowledge to create and capture value.

Based on this understanding, Tony points out five important distinctions of technology and entrepreneurship compared to other types of entrepreneurship.

First and foremost, technology entrepreneurship is strongly influenced and driven by future technological and scientific changes, not by existing opportunities. A vision of novel changes in technology is what differentiates a tech entrepreneur from other types. This definition is an evolution in the way we perceive technology entrepreneurship, as compared to previous general understanding. Second, technology entrepreneurship can be applied equally to new firms and established firms: Big companies can pursue technology entrepreneurship just as decently as small, newly established firms. Third, technology entrepreneurship is based on the cooperation of production, not on decisions made by individuals. This is the collaboration and joint effort in which each individual has their own role and responsibility in order to achieve a shared goal. Fourth, technology entrepreneurship is viewed as an investment in a project instead of subjective opportunities, meaning that it is linked to the amount of money (the investment) and the execution of realising an idea. Fifth, this framework also highlights the strong connection between technology entrepreneurship with the resource-based view of sustainable competitive advantage, which emphasizes the correlation between firm resources and firm performance.

While this paper has provided an important framework for understanding technology entrepreneurship, which I use to navigate my research topic in this thesis, there remain aspects of it that I do not fully agree, especially when applying to the area of indie app development entrepreneurship. To be more specific, I consider small and newly formed companies to be more susceptible to technology entrepreneurship, as they are agile and can switch to new technology and innovation more easily. In my viewpoint, the established and more sophisticated structure of technology in big firms makes it more difficult for them to adapt promptly to a new chance, as compared to small companies.

2.2. Entrepreneurship in Mobile App Development

2.2.1. Background

Although the first smartphones had come out before, only after the release of the first iPhone in 2007 did smartphones gain popularity among the public. The following year, 2008, witnessed the advent of the first App store and also the first Android phone. Since then, the growth of mobile devices like smartphones has been giving rise to the industry of mobile app development. It can be said that apps are the soul of smartphones, as they furnish simple and plain cellphones with an abundance of useful functions. From several basic applications such as email and map, the app stores have been rapidly growing with the introduction of a diversity of applications and games. By December 2019, the number of apps on Google Playstore and Apple App Store had reached 2.9 million and 2.2 million respectively. These two platforms combined generated a staggering \$39.7 billion in 2019 - Techcrunch (2019). Many activities which were traditionally done on websites now can be instantly reached by using apps. This mobile-oriented trend has stimulated a growing arena for technology entrepreneurship: Mobile app development.

Darrel M. West (2012) provided a thorough discussion on how mobile entrepreneurship helps create the opportunities for social and economic on the global scale. The article emphasizes how mobile entrepreneurship “improves access to capital and market information” as well as enables entrepreneurs to “serve broader geographic areas and reach new customers, the manner in which it empowers women and the disadvantaged, and the way mobile payments stimulate economic development.”

To understand how mobile technology improves entrepreneurship, it is important to perceive the fundamental components of mobile development from a technical perspective. To function, an application depends on some elements, which was described by A. Tarnacha and C.F. Maitland (2006) as *mobile application development dependencies*. Those elements are mobile content, development platforms, device and operating system, and mobile network. Figure 2 shows the interrelations between these factors

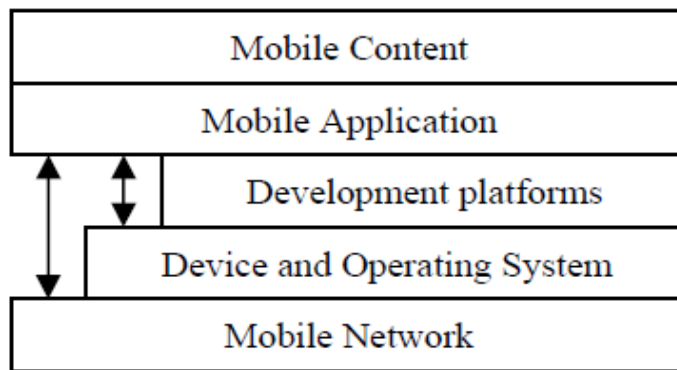


Figure 2. Mobile application dependencies

2.2.2. Mobile Application Development - a domain of entrepreneurship

A.Tarnacha and C.F. Maitland (2006) presented the ways in which mobile application dependencies influence entrepreneurial strategies and the market structure. One key finding of this research is that in order to succeed, app deployment first “has to cater to a broad variety of devices, operating systems and networks”. Technical development dependencies not only play an important role in “creating strategic uncertainties that entrepreneurial application developers face” but also shape mobile value chain evolution. Also in this paper, Tarnacha and Maitland pointed out three main themes that development dependencies affect market structure changes, namely Fragmentation, Intermediation, and Distribution.

The research of Tarnachar and Maitland has provided some early insights into the emergence of mobile app development as an entrepreneurial form. However, this study is limited by the number of samples they collected and especially by the time frame in which the market was analyzed. This study was conducted in 2006 when the market of smartphones had not reached the booming stage, thus potentially lacking other aspects of the mobile application development, especially when the mobile technology was advanced markedly in just several following years.

7 years after the work of Tarnachar and Maitland, in another research into Mobile Technology in Entrepreneurship, Supot Tiarawut (2013) highlighted more recent trends in the mobile application market. Also in this article, three main business models for mobile application in the modern period are identified and analysed:

- Paid application: The products that users have to pay upfront in order to use.
- Free application and paid content (In-App purchase): The app can be downloaded for free but users need to purchase additional amounts for content or extra features.
- Work for hire: Developers create a mobile app for clients under client brand names. This is a form of outsourcing.

Supot also states that mobile application development is a promising area of entrepreneurship in Thailand, the country which was the context of his research: “By focusing on inspiring a new generation of mobile application developers into entrepreneurship, incubating them into successful business and promoting their mobile app to the world market, Thailand could become a regional hub for the mobile development industry in the near future.” Supot (2013). This research is one of the foundation and inspirations for me to study mobile entrepreneurship in Vietnam, a relatively similar context in Southeast Asia.

2.3. Indie app development as an entrepreneurial process

2.3.1. Indie developers are entrepreneurs

Kerr, A. (2006) proposed a framework classifying the games development companies into three general types. Developers who are fully employed in a publishing company are the Type 1, which is so called the first-party developers. The second type is second-party developers who are involved in a contract in which they develop products based on concepts provided by a publisher. The type 3 includes all third-party developers, who independently have their own projects, develop their own software products which are sold to a publisher (Kerr, 2006, p.64).

Following this framework and combining it with the definition of a tech entrepreneur presented in 2.1, it is safe to conclude that indie developers are entrepreneurs by nature. They are no longer pure engineers as type 1 or 2 because they possess the elements of risk-taking, independence, ownership and full control over their products. In other words, they are able to decide on the characteristics of their projects as well as monetize them by adopting different marketing strategies. By utilising resources and trying to gain profits from the apps, indie developers also face the risk of failures (e.g. products does not return sufficient revenues to sustain the development costs), just as other entrepreneurs do.

2.3.2. Theoretical framework: The two institutional logics in the platform-based era

Although the mainstream mobile app development has attracted a great deal of attention to entrepreneurship researchers, there is still little study on how the minority of indie mobile developers are doing their business. It should be emphasized that this type of “indies” comes to existence thanks to the emergence of platform-based ecosystems, which are the so-called mobile platforms such as App Store and Google Play. These ecosystems “leverage the expertise of a diverse developer community, with skills and an appreciation of user needs that platform owners might not possess, to creatively develop new capabilities unforeseeable by the platform’s original designers” (Tiwana et al. 2010, p. 675).

In 2017, Yixin Qiu and Il-Horn Hann, in a study on indie iOS developers, shed light on the entrepreneurial process of indie app developers. In this paper, Yixin Qiu and Il-Horn Hann state that in the software development field in general and app development in particular, there are two institutional logics: The logic of profession and logic of the markets, which both influence how indie app developers are taking the opportunities on mobile platforms to develop apps and create income. In the new era, the third-party (indie) developers have to reconcile the conflicting demands for each side of logic. On the one hand, they have to meet the professional standards of technology or, in other words, the technical qualities and engineering practices and on the other hand, they have to take into account the constraints and opportunities of the market.

Although Yixin Qio and Il-Horn Hann's research focuses exclusively on the iOS platform, their findings have provided valuable insights into how the two conflicting logics manifest themselves in the entrepreneurial process of indie developers. In particular, the research pointed out that in the stage of generating an idea, indie developers tend to seek for ideas to build apps that reflect their personal needs or passion. This is the reflection of professional logic. However, in order for an app to succeed in the iOS market, it needs to address the mass market needs and follow the market trend. Without such elements, an app will not attract a high number of downloads or users interest, which are essential conditions for its viability.

During the execution of an app idea, or in other words, the designing, coding, developing and maintaining steps, it is important the indie developers follow the guideline from Apple and meet the App store standards for engineering and design quality. On the other hand, however, this practice poses a challenge for time effectiveness for which the app market constantly demands. For example if the technical process of designing takes too long with excessive experimentation, the iOS developers may not successfully keep pace with the fast demand from users, as well as produce enough numbers of apps in order to achieve reasonable rewards timely.

The third aspect in the entrepreneurial process of app development, as Yixin Qio and Il-Horn Hann described, the app marketing stage. It is interesting from this finding that iOS developers also encounter the issues in balancing the two sides of logic in app marketing. From a professional point of view, "Within app marketing, developers influenced by and enacting professional logic rely on peers to achieve marketing goals through peer support and peer recognition". This approach is popular as developers particularly appreciate their fellows' recognition especially that from elite counterparts. This means they seek first for the reputation among the developers community first. However, this approach poses a question as to whether the end users really have the same mindset as the professionals'. Yixin Qio and Il-Horn Hann concluded that being overly reliant on the developers community for feedback, recommendation and marketing may pose a risk of lacking the

relation between the app creators and end users, who will ultimately decide whether a feature of an app should be changed or not.

Overall, Yixin Qio and Il-Horn Hann have formed a framework for understanding the ways the iOS indie developers have adopted to find balance between the two influences throughout three stages of an mobile app entrepreneurial process. Although the iOS platform has some uniqueness in its operation, this research plays the role of a pioneer in comprehending the process of indie developers as tech entrepreneurs. With this generalization, the understanding of this subject has been significantly extended.

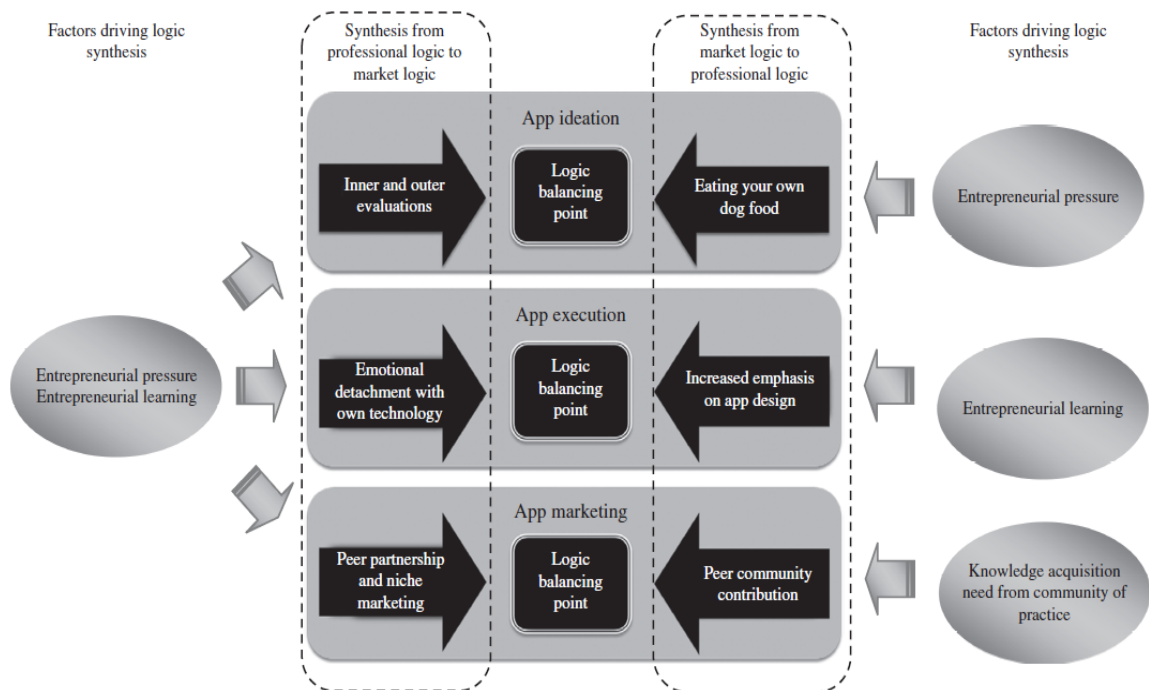


Figure 3. Independent iOS developers' two-way Logic Synthesis

3. Research Methodology

3.1. Research Strategy

This paper explores a single (intensive) case study by using narrative inquiry. Thus, it

combines the advantages of both elements, especially when applying to the topic of indie app development entrepreneurship. The reasons for my research strategy are presented below:

3.1.2. Using an intensive case study is a practical method to research indie app development

In research methodology, case studies have traditionally been considered lacking objectivity compared to other methods. However, using case studies as a research method is still a common practice because they can “offer insights that might not be achieved with other approaches. Case studies have often been viewed as a useful tool for the *preliminary, exploratory* stage of a research project, as a basis for the development of the ‘more structured’ tools that are necessary in surveys and experiments.” - Rowley, Jennifer. (2002)

Also, Eisen-hardt (1989) asserted that case studies are “ Particularly well suited to new research areas or research areas for which existing theory seems inadequate. This type of work is highly complementary to incremental theory building from normal science research.”

Case study research can be classified into two categories: intensive case study research and extensive case study research. Intensive case study focuses on the uniqueness of a case by offering a deep, and contextualised description. Extensive case study research, on the other hand, aims at “elaboration, testing or generation of generalizable theoretical constructs by comparing (replicating) a number of cases.” Päivi Eriksson & Anne Kovalainen (2010). In the next paragraphs, I will specify the characteristics of an intensive case study and explain why this approach would fit the topic of my research.

Intensive case study research is also called classic case study as its main purpose is to “ understand and explore the case from the 'inside' and develop understanding from the perspectives of the people involved in the case. The key interest is in the case itself, not in the pre-given theoretical propositions.” In other words, the aim of an intensive case study is to “learn how a specific and unique case works” - Päivi Eriksson & Anne Kovalainen

(2010). In order to achieve this purpose, the researcher must be able to make sense of the case by interpreting it in a verbalised format based on its rich details of experiences, events and interactions between people involved. In a nutshell, to conduct an intensive case study is to draw the meanings from it and make it clear based on reasonable interpretations in order to finally produce a story worth hearing.

With the arguments above, I came to the conclusion that conducting intensive case study research is a sensible and practical approach in the field of *indie app development*. The obvious reason for this is that indie app development, when considered as a form of entrepreneurship, is a relatively new area of research which is still in its early stage. There is still very limited existing research into this topic and the literature has not been organised in a systematic, theory-based and structured way. Thus, conducting a case study to explore a thorough instance of an indie developer is necessary to gain more preliminary understanding about the topic.

3.1.2. Narrative inquiry: The significance of stories

This case study is conducted following a narrative inquiry. This research approach is characterised by “stories” on which the analysis of research will be based. One of the specific things about narrative research is that “compared to non-narrative texts, stories are richer and thicker, more compelling, and easily memorable” (Clandinin and Connelly 2000, Riessman 1993, and Elliot 2005). Another characteristic of narrative research is that narrative or story-telling is considered a fundamental way we humans “organize, explain and understand our life and social relations”. Based on the scale of research, this study includes different personal narratives which are stories told by the people who are involved in the case. Unlike grand narratives or collective stories which encompass larger events of the world or a big community, personal narratives focus more particular periods of time and activities of individuals. Thus, stories told by and about individuals will preserve a diversity of emotions and experiences during particular stages of their own life. More specifically, in my research on the entrepreneurial process of indie mobile apps developers, the “stories” will hinge on the time they develop their apps, the feelings, both positive and negative that they experienced in different events during the process.

Two core concepts of narrative research that should be clearly differentiated are “story” and “narrative”. A story is understood as a sequence of events which have beginning and end points, or, in other words, is chronological. The term “Narrative”, though commonly used as the equivalent of “story” in daily language, is distinguished by researchers as “the textual actualization of a story in a specific time and context, and to a specific audience”- Eriksson, Päivi & Kovalainen, Anne. (2010).

There are several key justifications that back up my decision to adopt the narrative research design as a means to uncover the research questions.

First of all, it is a long process from brainstorming an app idea to the point that the developers can really generate profits from it. Thus, I would like to gain more insights from those people who have experienced all these steps in a story-telling form. A narrative research design allows the interviewees to gradually recall their experience, thereby providing deeper sharing during their entrepreneurial process. The interviewees are given more room to remember and connect their entrepreneurial events and to truly reassess what they did really have to struggle with. Viewing from the angle of a researcher, it would be interesting to listen to the stories told by those who are in the career in a chronological manner. Building a fully functioning app that can really be useful and attract user downloads is a real challenge as well as a time-consuming task. Some apps take from 4 to 6 months but many take even years to develop and deliver to the end users. Along with this process, many events and changes in the emotions and morale of the developer take place; In this way, a narrative research design is proved to be the better approach than other types, enabling listeners to better understand the real stories behind.

Secondly, I assume that each mobile app developer would experience different kinds of challenges, depending on their own situations as well as their types of products. In their entrepreneurial process, there also might be various ways that different app developers tackle the challenges. For instance, junior developers may find themselves in more different challenges than senior counterparts when it comes to indie development. The

reactions of developers to failures, for instance, may also vary greatly from individual to individual. The course of emotional development during the process also changed depending on other events in their personal life. Listening to their full stories then analysing them is an effective way to really immerse in the contexts and comprehend it at a deeper level. On the contrary, a structured/semi-structured interview can greatly limit and reduce the insights that I can draw upon.

Thirdly, a narrative attaches different events and experiences into clearer contexts which are more memorable and impressive. “While meta-narratives ignore the heterogeneity and variety of human experience, ordinary people's mundane, personal stories focus exactly on that” - Eriksson, Päivi & Kovalainen, Anne. (2010). Regardless of forms, e.g narrative interviews and conversations, biographies, journals and autobiographical writing, personal narratives will contain in it a diversity of human expression. This will facilitate the analysis process as it helps the researcher understand more about the stories being told, considering it as *human actions*.

Furthermore, it should be emphasized that the narrative approach gives researchers the opportunities to “tell stories about themselves, to include their own personal narratives into the study”. (Päivi Eriksson & Anne Kovalainen 2010). As an indie app developer myself who has been involved in the activities of the group, I am eager to reflect on my own experiences while at the same time, drawing on stories told by others and analysing them. A self-reflection is an important characteristic of narrative research design, which will provide a great opportunity to dive deeper into the concepts.

3.2. Research context

3.2.1. An overview of Vietnamese mobile development industry

My study concentrates on the mobile development industry within the national context in Vietnam. This is a Southeast Asian country with a population of over 95 million (2017). 70% of the population is in the working age and 24% are people of the millennial

generation. Notably, the number of Internet users reaches 54 million in 2017, of which 42 million - equal to 45 % of the total population using Mobile internet. This abundant consumer base enables great opportunities for mobile developers to develop new products and services. Furthermore, smartphones have become prevalent in Vietnam, entering most regions of the country as a result of the trend of shifting from big screen devices like PCs towards smaller screens". "Vietnam is a tech-savvy country. With a strong smartphone adoption rate and high media consumption. Vietnamese people are willing to try new apps but, at the same time, have the highest uninstall rate among APAC markets. Thus, pose a difficult challenge to retain user" - Appotta Report 2018

Regarding the mobile industry, statistics in 2017 shows a "duopoly" as is the global situation: Android Operating System and iOS account for the majority with 57% for the former and 37% for the latter. Thus developers with expertise in these two platforms are by far the most popular ones on the mobile development jobs market. A comparison between May 2017 and May 2018 shows a slight decrease in the total games downloads; More games are closing than new games entering the market. This fact signifies that the mobile game market is matured and the situation seems to be increasingly difficult for small and medium game publishers (including indie game developers - the main subjects of this research). However, as the number of games in competition falls, the competition also decreases, enabling the ones with high-quality contents to still thrive.

Overall, the Vietnamese mobile app market has high potential and competitiveness that are promising for developers in general and indie app developers in particular.

The subjects of this research - Vietnamese indie mobile developers- make up only around 4% of the total Vietnamese developer workforce (Vietnamese developer report 2017). They are an existing part of the jobs market but unique in that these developers independently create their own products and are mostly not part of a big company or an organization. Some are both full-time workers in an IT company but at the same time have their own start-up projects. This research also counts this type as indie developers in this context.

3.2.2. Indie developer community in Vietnam

In Vietnam, mobile developers mostly base in the two biggest cities - Hanoi and Ho Chi Minh city, which are also the two largest tech centres of the country. The age range from 20 to 34 is regarded as the most popular age for developers in Vietnam, accounting for 70% of total developers. This age group is the most representative for the whole developers' community and also the most dynamic community who are ripe for creativity and skills. The older group (34 and above), if continuing in their careers, usually take the managing positions or senior developers, while the age of below 20 is considered too young for indie mobile app developers and thus is not representative.

The majority of the developer community are male. According to Vietnam Developer Report 2016, male developers make up 93 per cent of the developer community, while females contribute only 6 per cent. This 6 per cent has already included all types of developers (such as full-time employed ones), so the actual number of indie female developers is even lower. Thus, it will be more sensible to conduct research on a male developer. This choice reflects the gender distribution in the industry's context as well as facilitates data collecting.

The percentage of indie game developers in Vietnam is still humble (4% of the whole community). However, along with the rapid expansion of the mobile market as well as an increased opportunity to get access to programming knowledge, this group of people becomes bigger as more and more young people are interested in pursuing the career. Some successful stories such as the world-famous and highly profitable games Flappy Bird or Freaking Math in recent years, which are created by Vietnamese indie game developers, have given the whole indie community a big inspiration.

3.3. Sample - A short description of the subject

The single and unique subject of this narrative case study is a 27-year-old male Vietnamese indie developer who is the founder of **Bro** - a small indie app studio, which creates apps

and games on the Android and iOS platforms. For the privacy reason specified by this developer, in this case study thesis, I will use his developer name on Android Playstore (Bro), instead of his full name, to refer to him.

When it comes to researching Bro as an indie developer, the most important element that should be taken into account, besides his work life experiences, is his products, that is to say, the series of applications he has published on the two mobile platforms (Android and iOS) so far. Apart from the narratives told by Bro, I also consider his apps as the subject of research. These apps and their performance on the app stores reveal important details on how this developer is doing entrepreneurship.

The links to the developer's products can be found at:

- **On Android Play Store:** [Link to Bro.'s Android products](#)
- **On iOS App Store:** [Link to Bro.'s iOS products](#)

Bro was born in 1992 in Quang Binh - a province located in North Central Coast of Vietnam. Compared to other parts of the country, this is a relatively underdeveloped region with very limited tertiary education (only one provincial university with no specialisation in computer science and information technology). As a result, many high school graduates in this region seek for a university degree in more developed cities, the most notable one of which is Ho Chi Minh city. Like many peers in those days, Bro followed this pathway to Ho Chi Minh city and eventually got accepted to VNUHCM-University of Information Technology - a public university which is a member of Vietnam National University.

In the early year of his university career from 2010 to 2013, Bro studied the fundamental skills and knowledge in computer science before specialising in mobile app and game development during the late-2013 to mid-2015 period. His main expertise is Unity - one of the most popular game engines, which allows developers to make games and publish them on multiple platforms. This game engine is widely used by indie developers for “ its excellent functionality, high-quality content, and ability to be used for pretty much any

type of game”. Apart from Unity, Bro has a good command of Java and Swift, the two main programming languages used in Android and iOS apps development.

Although my research approach emphasizes the uniqueness of the case being studied, it should be stressed that the profile of Bro is typical of an indie developer in Vietnam: A male in the age range of 20 and 34 with a background (university degree) in computer science (or information technology). Indie developers in Vietnam who switch to this career from another background are exceptionally rare, as this profession requires strong expertise in IT, especially when the work is done independently in indie development.

3.4. The role of the researcher

My approach to this case study is from the viewpoint of an *insider researcher*. Brannick, T., & Coghlan, D. (2007) describes insider research as “research which is undertaken within an organization, group or community where the researcher is also a member.”. To elaborate, I myself have been involved in the field of indie application development since 2016. During the last three year, besides completing the Master’s degree in Entrepreneurship at Aalto University, I have been actively participating in the community of mobile developers in Vietnam through a closed Facebook group, which was recommended by Bro himself. Although indie app development has not yet been my professional or entrepreneurial career, I have developed a strong interest as well as technical knowledge in the field by learning and creating apps on Android. This interest and knowledge enables me to view an indie developer from the vantage point of an insider researcher.

As Bonner and Tolhurst (2002) stated, being an insider can offer three important advantages. First, being an insider allows me to better understand the field and the cultural aspects of it. While researching Bro’s jobs, I find it easier to understand his entrepreneurial process because I have been familiarised with the way an indie developer develops, publishes and maintains applications. Second, as a member of the indie developer community, I do not disrupt the flow of social interaction in an unnatural way. That is to

say, my conversation with Bro is just as natural as that between two colleagues having mutual understanding of the field. Despite being an entrepreneurship researcher with less technical knowledge and more focus on the marketing/business aspect of the apps, I still have the exposure to the field, which is sufficient to develop the conversations and interpret his stories in a meaningful and comprehensible way. The third advantage is to have “an established intimacy which promotes both the telling and the judging of truth.” Sema Unluer (2012). This aspect facilitates me in making sense of the statistics in the case.

Furthermore, as a member of the Vietnamese indie developer community, I have come to know Bro since 2016. Between us is a good partnership regarding the matter of apps development. Thanks to this close collaboration, I have had many chances to observe his career over a three-year period, witnessing his step-by-step improvement in the field.

However, I also acknowledge that being an insider can pose some challenges to the researcher, e.g. the loss of objectivity and the so-called *role duality*, which causes the difficulty for researchers in balancing the insider role and the researcher role.

3.5. Data collecting methods

The data of this research is obtained through three channels:

1. The audio records from narrative interviews with Bro: This is the main source of data, which was recorded via Facebook Messenger. Despite the geographical distance, my communication with Bro has been facilitated greatly thanks to the convenience of this tool. Apart from traditional video-call interviews, Facebook Messenger allows the interviewee to record voice messages instantly by a single tap. Voice message is a great feature which particularly suits the design of a narrative interview:

Compared to interactive video-call interviews, in which the interviewee technically has to reply to instantly to the interviewer’s questions, voice message enables him to be a true story-teller. This means the interviewee can have unlimited time to calmly recall his work life and share his experience without any pressure as in

face-to-face conversations. A narrative interview in my research design typically took place in 2-2,5 hours, starting by a direct video call with the purpose of introducing the research questions, creating a warm atmosphere, and clarifying the research objectives as well as other ethical issues. Afterwards, the interviewee will freely tell his stories, which will be recorded in voice messages. These voice messages do not necessarily be one single audio, but can be saved into different small files, depending on when the interviewee taps the record button. With this design, my purpose is to make sure the interviewee will have sufficient intervals to fully relax and tell his stories.

Overall, during my research timeframe, several narrative interviews have been recorded in different stages of Bro' indie app development process, combining with some additional open questions for him. The language used in the interviews as well as voice messages is Vietnamese, which would then be transcribed and translated into English. It should be noted that the atmosphere during the conversations was always warm, relaxing and constructive. This is my priority when conducting a narrative interview in order to eventually obtain valuable information from the subject without rushing or forcing him as in short interviews or online surveys.

2. The statistics and performance of his apps on Android Play Store and iOS App Store. Along with stories about Bro's work life told by himself as an indie developer, I have also been studying his products to observe his progress, challenges he faced and strategies he used to improve and develop the apps. To indie developers, the apps are literally their "offspring", an important asset which not only serves the entrepreneurial purpose but also a source of passion and pride.

Thus, by analysing the apps' genres, characteristics and performance, many trends, ideology and strategies of the indie developer can be further understood. Generally speaking, the series of apps that have been released so far also reflects the work life

of Bro as an indie developer. It acts as a chain of milestones marking his progress over the time period being researched.

3. Other data such as discourses between Bro and other members of the Vietnamese indie community (Facebook group), and technical conversations he made with me in textual format (text messages):

This data source serves as an additional channel helping me explore the work life of Bro. As a member of the indie community in Vietnam, as well as a partner of Bro, I have studied the ways he managed the process of problem solving in technical as well as app marketing issues. Collecting this conversational data helps diversify and enrich my narrative research evidence, making it easier to explore the entrepreneurial process in a more in-depth approach.

3.6. An overview of analysis method

In this paper, I will adopt the process of case study analysis proposed by Päivi Eriksson & Anne Kovalainen (2010). In particular, there will be three main steps:

First, the case record will be presented. Case record is the empirical data collected during the research process. This is the narratives extracted from all audio recorded using Voice Message on Facebook Messenger, as well as other data such as the apps' statistics and descriptions on the app stores and Facebook group conversations. Since the original language is Vietnamese, I have translated the words in the raw audio files into English and combine them into a fluent coherent story.

The second and very important step of the analysis process is coding. With this case, I will first group the data into categories (themes) and then arrange them chronologically. Päivi Eriksson & Anne Kovalainen (2010) stated that "in case study research, preplanned systematic coding is most often used when the research is grounded in existing theory and attempts to improve the theory, or to test it". Although, my research is not completely dependent on an existing theory, my theme coding is partially influenced by the findings of

Yixin Qiu and Il-Horn Hann (2017) in their article “Logic pluralism in mobile platform ecosystems: A Study of Indie App Developers on the iOS App Store”. Following this finding, I will consider the entrepreneurial process of an indie developer to include some main stages: App Ideation, App Execution, and App Marketing. However, this is only a foundation as this case study will also be analysed further developed based on many other unique aspects of it.

The third step is to analyse the narratives (analysis of narratives) and other additional data using an inductive-oriented strategy. This means that the analysis of the case will lead to key findings based on a synthesis of the natural development and variation of the case, and not strictly grounded in a pre-formulated theory. The two key analytic techniques that will be used for this case are *thematic* and *time-series analysis*. More specifically, *thematic* involves finding themes, topics, categories, and patterns from the raw data, while time-series analysis concentrates on building chronologies of the subject’s entrepreneurial process.

3.7. Ethical considerations

Ethics is a crucial issue in any research. Acknowledging the importance of ethical considerations, I aim to meet all the 10 criteria of ethical considerations proposed by Bryman and Bell (2007). In this section I will outline these principles and exemplify how these criteria are met in my research.

1. No harm to the research’s participants in any situations: In my case study, Bro is the only participant who is invited to only give and share his experience as an indie developer; Hence, no business-related or physical harms exist.
2. Respect for the dignity of the participant: The participant is a highly skilled and experienced developer whose dignity is my top priority in the research.
3. Full consent from the participants: All the narratives, interviews and additional data are obtained through full acceptance by Bro.
4. High protection for the participants’ privacy: The privacy of Bro is ensured. The address to his apps on Play stores and App Stores are displayed in this study based

on his approval. No sensitive information such as full name, birthday or developer account are revealed.

5. The adequate confidentiality of the research data: The links to the apps on the app stores are public as they are. This is the basic information that all people in the public can get access to. Apart from this, no sensitive information such as source code or the confidential technology are revealed.
6. Anonymity of the participants: Addressed in principle 4.
7. No deception about the aim of the research: This research objectives have been introduced thoroughly to Bro in an accurate manner. Thus the participant has been aware of the correct purpose of the study.
8. Declaration of all possible conflicts of interests, sources of funding and affiliations: This research does not involve any of these situations, thus naturally meeting this criteria.
9. Transparency and honesty in any type of communication: The communication between the researcher and the participant is conducted through Facebook Messenger and in an honest, transparent and constructive manner.
10. No biased interpretation of data findings: This research follows a systematic guideline for case study analysis. The researcher aims at providing the most unbiased information as well as the most accurate translation and interpretation of the data.

4. Case analysis and Findings

4.1. The case record

4.1.1. The narratives of Bro's founder

The story of a Vietnamese indie developer

I am an indie game and app developer, the founder of Bro studio on Play Store. My career in information technology started in 2015, when I just graduated from The University of Information and Technology - Ho Chi Minh city and was recruited as a trainee to a small company which creates game products. As a fresh graduate, I think I was lucky to join this company and have a chance to be involved in many different stages of making a mobile game product. From that, I nurtured my dream of creating nice games. Compared to big companies, which you are more likely to work in a small module of a big project, this small company gave me the chance to participate in all various phases of making a game, from brainstorming an idea, working with designs, coding to submitting the game to the stores. I remember that I had to move from Ho Chi Minh to Hanoi to work in this company. But the relocation and changes in the environment did not affect me too much. I like to make game apps and this company gave me a lot of autonomy to do so. That was the nice thing there.

[...]

After around 6 months working and learning there, I was then hired by a higher manager in that company to make his own products. I worked for him in about 2-3 products until I got familiarised with many aspects of the Apple and Android app stores and the steps to publishing apps on these app markets. I felt that my skills had been well improved. At this point, I started to register and purchase developer accounts on Apple and Google, in order to prepare for my entrepreneurial journey of making my own mobile apps. You know, in order to have the developer account you need to pay Google a fee of 25 USD. And for Apple it costs even more: 99 USD. However I am fine with that because it is a kind of a prerequisite before you can publish your apps on the store. I mostly create games using Unity - a multi-platform engine, so with these developer accounts I can create games and release on both platforms, quite convenient!

[...]

Now let me turn get back a bit to the turning point when I just graduated, there were two comparable options in the mobile industry for me to choose: games or other general and utility applications. I decided not to make such apps because I was quite bored with making hotel-managing software or sales-managing apps during my university time. I generally prefer animations and physical effects of beautiful and intriguing games, and I

am a passionate game player myself. Well I must say I have been playing a lot of games since a very young age. That's why I ended up embarking on the game industry. However I also make other apps as well if there's a good idea springing up.

*Until July 2016, I finally submitted my first game on the Apple app store. One month after that I managed to have the Android version released also. This is the result of 2 months of my relentless effort: Everyday I still commuted to my company in the day time and came back home continuing with my own project in the evening. That was a hard-working and tough period for me but I felt good as I was creating some values for my own future. I was very happy when the game was finally published in the stores. [...] To talk a bit more about this game, its name is "**The circle of drinkers**". In the early 2016, I came up with the idea of creating this app when I realised that my friends in Hanoi often partied and drank a lot. So I thought it would be nice if I made a game like "The wheel of fortune" but for the drinkers. They can use my game to play when drinking together; you know, to find out the next guy who has to drink or to punish someone to drink the full glass for getting an unlucky turn, something like that". I think this game would be funny and I could play it with my own friends as well. At that time I didn't think about any earning prospect from the game yet. All I was concerned with was whether it would be accepted by Apple and Google to get published. I was also just a bit worried that the idea might sound silly and nobody really plays. But eventually I decided to pursue this idea, because anyway I was a newbie and getting a project done was already a success. I think that mindset is what made the game really come to real life.*

However, life is not always a rosy dream. The outrageous truth was that my first game app barely generated any income - each day it made not more than 0.5 USD. As you can remember at this time I excitedly shared the game with all people in my circle such as friends and relatives. After posting the link to the app on my Facebook page, I got a lot of compliments from my friends who really admired me for making the first app, which they can really download to their iPhone. More than a hundred Facebook friends liked my post but only about 50 friends gave it a try, all of whom are my close friends. You know, this kind of game is only for guys who drink. The girls in Vietnam don't usually drink alcoholic stuff so they didn't download the game at all. Gradually, after several days when all the

possible “first users” ran out, I saw the download number just standing still at around 100 downloads. It was very frustrating as I did not know how to increase it. It was because of my weakness in advertising as well as my knowledge about marketing on apps stores at that time was still basically zero. And the insignificant financial gain left me deeply frustrated. However, despite this frustration I still continued working on other projects, just for fun and to find other opportunities.

[...]

Over time, I still made games. However I started to be a bit more open-minded when generating ideas. I had thought that a unique idea was the most important thing but after the first game, I changed my mind. So I started to basically learn some ideas from other games as well. It is not that you copy 100% of others but you just get the idea and make it your own way. For example my second game, which was released in October 2016 - just three months after the first, was “**Rock Paper Scissors Reverse**”. Its rule is like the funny game that the kids usually play “ Scissors beats Paper, Paper beats Rock and Rock beats Scissors. “ I bet many other developers had made this kind of game but at that time I still went ahead and made it, because I thought the way you made it was more important than the idea itself. I finished the year 2016 with the two first games published. Not so successful yet but I was quite satisfied because I had the games on the store, which was one of my dreams back in my university time.

[...]

2017 was not a fruitful year for me when it comes to my indie career. The first two games barely generated any significant income and I had to struggle to sustain my life by applying for a job in another company. Also, I felt that my skill had not yet been ripe for a full-time indie career and I must sharpen my technical skills by learning and improving through bigger projects. In the whole year 2017, I only released one indie app on the Play Store called “**Math Amazing**”, which is in the educational category. It is a kind of a brain training app helping people to do math and improve their brain’s response. Overall in 2016 and 2017, all my apps were quite simple and not so technically demanding. Still, they were fully-functioning. When the number of users grew a bit more, I also learned to implement the ads banner on the apps, which allows the advertisers to show ads on my

apps. This created the first source of earning, although it vastly depends on whether your app is a “hit” app.

[...]

It took me around one and a half years more, and I started to receive money from Google. I was really happy to receive the first **100** USD from ads! It was not a big amount compared to my salary at the 5-9 job but very meaningful to me at that point of time. This improvement may be attributed to my active effort in running ads on Facebook to make people know about my products. I also extended my developer account to further my indie career after this “first win”.

Generally, this first gain motivated me greatly. My morale was raised high again. The failed games gave me lessons and technical skills. I also actively consult precedent developers for experience and research tutorial online to improve my skills.

During 2018, I was still making games with two different schedules: a daytime job in the morning when I work for a company and an entrepreneurial path in the evening time - creating my own games. I think during this journey, my biggest challenge is lack of time and the ability to maintain good health. The intensive schedule of the two schemes: daytime for a game company and evening time indie development was sometimes very exhausting. This made the process of making a game very bumpy and time-consuming. If I devoted all the time to these two schemes, there would essentially be no room for other activities. And I think this was a big challenge for me to manage time effectively.

However, I can say that 2018 was a productive year for me, with the indie spirit rekindled, I worked hard and published 6 games and apps to the stores, counting both on Android and iOS it would be 12 apps! 6 different apps a year is quite a good number for an indie if compared to my counterparts in the indie community. Again I did not put too much attention on the uniqueness of the idea but on how the game is created and whether it is well-designed and has a good user experience. This series of games in 2018 marked some improvement in my technical skill in making more well-designed games and apps. For example, the game **Matchstick Puzzle** I created in the early 2018 has such quality.

Also in this year, a big improvement comes to the business model of the apps, as I started to implement the in-app purchase features in some of my most liked apps until that point of time. For example the games “**The circle of drinkers**” and “**Connect Block: Brick**” have been offered the in-app purchase feature. You know, in-app purchase is a great way to make the games free to download and attract many users, while still potentially generating good income. You can create some premium functions or assets in the games, which users have to pay to get them, besides other basic features. To implement this in-app purchase, you need to take some steps required by Google and Apple. For example, with Google, you will have to set up a profile in the Google payments center. It is called the merchant account which enables you to sell paid apps and in-app products.

I think that by successfully introducing the in-app purchases, the potential of my games have increased a lot, compared to the period when I only put the ads on them!

[...]

So after a lot of advancement in 2018, my confidence in the indie career was boosted significantly. I continued making many interesting apps and games in 2019. For example in Feb 2019, I published “**Finger Chooser: Tap Roulette**”, then in April 2019, “**Who wants to be a millionaire**”. The game “**Who wants to be a millionaire?**” got a lot of downloads, now it has approximately 50000 downloads. This year, I also for the first time released a paid version for the app “**Finger Chooser: Tap Roulette**”. This is for the users who want to just purchase and get rid of the ads completely.

By the end of 2018, I had implemented basically all types of earning models for mobile games: free+ads; in-app purchases and paid apps. And with all these approaches my games are now generating quite better revenues than before. I have more than 20 games and apps on the stores in total now, counting both versions in Android and iOS. I could not reveal the exact earnings of each game, unfortunately. However the sure thing is I have been enjoying making games. So I would say, now looking back, the difficult days in 2016 and 2017 did not overwhelm me and instead it gave me valuable experience and skills to get better in my career.

[...]

I have mentioned some challenges in my career but I think I should also talk more about the marketing problems, for example. Frankly speaking, the first and foremost problem is “money” and how to use that money effectively. By “money” I mean the cost to run ads. It is quite challenging for me as an indie to advertise my products, compared to a big game publisher or an established mobile development company. You will have to pay Google or Facebook for the marketing campaigns you create to advertise your apps. Without a proper consideration as well as an effective strategy we may waste a lot of money on running ads but not receive back a good number of users. The second thing about marketing is how to boost your app ranking in the store’s search engine. You know people often search for the apps they want and if your app ranks too low, say, in the 100th, then nobody is going to see and download it. Honestly, I did not really recognise the importance of this with my first several apps in the 2016-2017 stage, so I was quite frustrated how i wasted a lot of money running ads but the marketing costs did not work as expected. Later on I have found out that just some changes in the app store listing can greatly improve its ranking. For instance, if you choose the right keywords for the title and app description by using the most relevant keywords as possible, and test many ways to find the optimal ones, then there is a good chance that your app would go up.

Furthermore, I must admit that my English skill isn’t that good enough, even though I am quite confident with my coding and logic thinking. I was born in a region where kids only study Natural Sciences such as Maths, Chemistry or Physics to prepare for the university entrance exams into many technology universities. Thus, English is not commonly focused in my school time. As a result of this, after my graduation, I had to struggle a lot with English especially when it comes to speaking and writing. Well, people might think my career as a coder does not require too much of such language skills but I realised it became absolutely vital when I pursued indie app development. For example, when you want to release an app targeting international users, you have to deploy a marketing campaign, run ads to show people how great your app is. Without a good writing skill, you wouldn’t even be able to write a professional description or convey the correct messages. More seriously, you probably have problems translating the content and cannot offer the

most natural texts in your app user interface. Because of this weakness, I had to force myself to learn English properly. My comprehension is fine but I should definitely improve in writing and speaking as well.

[...]

To sum all this talk up, for me the indie app development is a bumpy process, which takes a lot of time and effort. It is a lonesome road where nobody accompanies you in the projects, because you will have to do all tasks, from coding, designing the user interface, to marketing, even some tedious ones. I don't think only passion is enough for success in this career. In my case, in the early stage, as I said, I had to rely on my income from a day job to follow my dream. However, as long as you love the games and apps you make, you will be proud of the products and put more effort on it. You will find a way to balance and optimise the time everyday, until your apps start to make money. Finally, the most important thing, in my opinion, is to learn new technologies and catch the trends to create interesting products. Be hard-working and ready to adapt to new changes. That's my thought on my career as an indie.

3.1.2. A chronology of Bro's apps:

This data is collected based on information shown publicly on Bro' studio at Play Store and App Store. The apps' details are arranged in the timeline order, earlier to later following the release day on the Android platform. For the protection of privacy required by Bro, the exact revenue of each app is not shown. However, basic information such as numbers of downloads on Android, app categories and Business Model are displayed with his consent.

App name	Release date (Sorted by Android releases)		Genre	Number of downloads (on Android)	App Business Model
	Android	iOS			
<i>The circle of drinkers</i> (Vong Quay)	Aug 04, 2016	Jul 08, 2016	Entertainment	10.000-50.000	Freemium In-app purchase: 1-2\$

Ban Nhai)					
Rock Paper Scissors Reverse	Oct 15, 2016	Oct 12, 2016	Arcade	100-500	Freemium In-app purchase: 1\$
Math Amazing	Apr 02, 2017	Apr 04, 2017	Educational	100-500	Free + Ads
Roll Road: Ball Jump	–	Jun 30, 2017	Entertainment		Free + Ads
Crossword Pro Master	–	Jul 11, 2017	Puzzle		Free + Ads
Matchstick Puzzle	Jan 07, 2018	Jan 05, 2018	Puzzle	1.000-5.000	Freemium
Hovercraft Road: Airplane	–	Jan 30, 2018	iOS Games		Freemium
Connect Block: Brick	Apr 16, 2018	–	Puzzle	10.000-50.000	Free+Ads
Block Roll: Puzzle Block	May 24, 2018	May 24, 2018	Arcade	100-500	Free + Ads
Tricky Questions (Hoi Xoay: Tao Biet Tuot)	June 05, 2018	Oct 03, 2017	Word game	100-500	Freemium In-app purchase: 1-3\$
4 in A Row: Tic Tac Toe Online	Jul 16, 2018	Jul 26, 2018	Board Game	5.000-10.000	Freemium In-app purchase: 1-5\$
Who is more stupid?	Sep 11, 2018	Sep 14, 2018	Word game	500-1.000	Freemium
Finger Chooser: Touch Roulette	Feb 21, 2019	Mar 02, 2019	Entertainment	50.000-100.000	Free + Ads

<i>Who wants to be a millionaire?</i>	Apr 08, 2019	–	Word game	10.000-50.000	Free+Ads
<i>Finger Chooser: Touch Roulette</i>	Sep 09, 2019	Sep 10, 2019	Entertainment	50-100	Paid Price: 0.5\$
<i>Frozen Block Puzzle</i>	Dec 14, 2019	Dec 14, 2019	Board Game	10-50	Free + Ads

Table 1. A chronology of indie apps made by Bro. during the period 2016-2019

3.1.3. Other additional data

To provide deeper understanding of the entrepreneurial process of Bro, I have also made other additional open interviews as well as kept notes about textual conversations on Facebook group with him along the way. For example, since one important source of his revenue comes from Ads, I have interviewed him to know more about how ads on his mobile apps generate revenue.

Open Interview in November 2019: How indie apps generate revenue through ads

Researcher: Many of your apps are free of charge but can still generate some income from users by showing ads. Can you explain more about how this kind of business model works in your apps?

Participant: *When your app gets a good number of downloads, you can start thinking about integrating ads into the app's user interface. There are some platforms which allow us to show ads on our apps, and in return we receive money for users' clicks on ads. For example, one of the most popular platforms is Admob, which is provided by Google. Every indie developer like me has to register an account on Admob to start showing ads.*

Researcher: This means the more users click ads, the more income you earn?

Participant: *Basically, yes. However this doesn't mean that we developers can click the ads ourselves or encourage our friends and relatives to do so. Google calls this "invalid traffic" and can easily detect any cheating behaviour using very smart algorithms. I have been following the rule but I did see some guys in the Facebook group got banned because of this. So always be honest and abide by the rules of Google and Apple, because once you've had a bad reputation, they might ban your account forever.*

Researcher: What are the factors that decide your revenue on ads?

Participant: *Basically my earnings in a month can be calculated by Number of Click in that month multiplies by Pay per click. The pay-per-click really depends on the regions where the users are located. Like in Vietnam the Pay per click is relatively low, generally below 0.5\$, while Clicks from other countries like in Europe or USA can give you a lot more, say, even 1-2\$ per click. That's why recently I am switching towards making more international apps, which target global users in many countries, not only Vietnam. The other factor is Number of Clicks. To increase this, literally you have to make nice games and apps which are engaging. The more time users stay in the apps, the more chances they will interact and click the ads, which will eventually boost your income. The marketing will only help partly to increase numbers of users. But if the app itself is not interesting, or full of bugs, then they will abandon your app and move on with others. Also, the types of ads and the appropriate use of them also affect how effectively your ads can perform.*

Researcher: You have just mentioned the types of ads. Can you explain more about these types and how they currently work?

Participant: *Currently I am implementing four types of ads, namely Banner, Interstitial, Native Ads and Rewarded Video Ads. The first one is Banner, which you've probably seen because it is a traditional way to show ads. The banner is the ads that stay on the screen when users interact with your app. It is usually a rectangle in the top or bottom of the*

screen, which can refresh the content automatically. Next comes Interstitial. It is the full-screen ads, which is shown whenever there is a “break” during user interaction. For example when users play my games and there is a pause between two levels, then that’s the good time for me to show this type of ads. It also gives you a better chance that the user would click on it, compared to the Banner. Another type is Native Ads. As its name suggests, this kind of ads look like the views of the app’s content, so it is natural and less intrusive to users. Finally, the Rewarded Video Ads is a new type that I also tried recently. It is quite interesting because this way you can encourage people to just watch the ads and get the rewards in the game. These four types are the most popular on Admob currently.

Another important model in Bro’s apps is Freemium. In order to understand this type of model, I have had some textual conversation with him regarding this topic. In order to be as specific as possible, I aimed not only at making a general sense of Freemium but also at clarifying how this model was applied to his real-life apps.

Key notes: Discussion with Bro on the Freemium model (Note-taking from a Facebook group conversation on December 2019)

- *In a general term, Freemium is a business model, especially on the Internet, whereby basic services are provided free of charge while more advanced features must be paid for.*
- *According to Bro, freemium is an ideal way for mobile apps to get more users to download while potentially generating revenue by in-app purchases.*
- *Currently Bro has around 8 apps which adopt this type of model, including both Android and iOS apps. The price range for in-app products he is currently offering is from 1\$ to 5\$. Bro believes that this model has a lot of potential and he will try to make more “hit” apps and games which implement a freemium model instead of paid apps.*
- *Bro considers “Freemium” as a more tempting method than “Paid App”, because he thinks it will grow users faster a Paid app.*

- *Bro particularly welcomes the new type of ads, the Video Reward Ads, because he believes it can serve as a good method to make the Freemium model more efficient.*
- *He also realised using “Remove Ads” as an in-app feature may not work efficiently and users are unwilling to pay for something that they’ve already learned to ignore. Instead, he believes that indie developers need to create apps and games that are highly engaging or useful that the users can’t resist to pay for in-app products.*

4.2. Findings:

4.2.1. How a Vietnamese indie mobile app developer made a business from his apps during the period from 2015-2019?

- **A summary of Bro’s indie development as an entrepreneurial process**

The analysis of the narratives by Bro reveals important insights on how a Vietnamese indie app developer has progressed in his career. Using a time-series analysis approach for case study, the first research question can be answered:

In order to finally make a living from his own apps, this developer has experienced many phases in his development. The five key stages can be summarised, analysed and highlighted as follows:

Stage 1: Building fundamental technical knowledge and skills:

It is clear that Bro can hardly publish his first app without some exposure to the app development process. In reality, he acquired these valuable skills from the first company he worked for. As he mentioned, “Compared to big companies, which you are more likely to work in a small module of a big project, this small company gave me the chance to participate in all various phases of making a game, from brainstorming an idea, working with designs, coding to submitting the game to the stores.” Also, the senior manager who hired him to make 2-3 products also played an important role in training and completing his skill. This made way for him to start his indie career in Mid 2016.

Stage 2: Developing the first indie products:

Through the narratives of Bro, one certain thing that can be extracted is the importance of the first product to an indie developer. This is not only a matter of putting technical skills into practice, but also a foundation for the developer's self-confidence in the long run. In this particular case, the success in the first time releasing a full-fledged product to the App Store has boosted Bro's confidence. Even though the initial revenue was insignificant, the game "The Circle of Drinkers" was created by his original idea and developed single-handedly by him. This is what he described as "a source of pride". This case can be related to the definition of indies as people whose main motivation is passion. "The first steps are usually the biggest" - This stage emphasises that fact: the completion of the first functional projects is more meaningful than its financial gain.

Stage 3: Facing difficulties and confusion:

The first app release is an important milestone. However, an indie developer may still abandon this career path if he does not find the right way to develop further. How can he make the apps into a business that can sustain his living? Is it really worth developing indie projects while no good prospects are guaranteed yet? Bro himself has gone through all this confusion, and it did lead to his sluggish period between late 2016 and late 2017. As he explained in one comment "I was happy after the first app but after that, I was not really sure whether to pursue indie app development as a career. The workload from my day job also overwhelmed me. And I also felt that my skill was not ripe for high-quality and fully professional products, so I spent time continuing learning the mobile technology as well as coming up with some new ideas.". This stage can be deemed the turning point in the career of Bro: the ways he resolves all this confusion also shape and decides his entrepreneurial journey.

Stage 4: Getting back on track:

Even in the challenging stage, Bro still maintained his indie projects. "During 2018, I was still making games with two different schedules: a daytime job in the morning when I work for a company and an entrepreneurial path in the evening time - creating my own games". This decisive time gave him experience and skills in a professional environment. Even

though the separated-schedule scheme was extremely tough, his enthusiasm for the mobile game development remained unchanged. Also, it should be noted that the first earning from Google has boosted his belief in the prospect of making indie projects. This contributed to regaining his momentum and driving him back on a more committed approach towards indie development, beyond just simply a pure hobby.

Stage 5: Growing and maintaining the momentum

The year 2018 was a productive year for Bro with many products released to both Android and iOS platforms. From this year on, Bro's skill has been improved significantly. Not only technical mobile development skills, but his understanding in app business models were also enhanced. He has learned and adopted various techniques in marketing apps and app store optimisation, thus leading to an impressive growth in the apps' performance. One of his games has reached nearly 100.000 downloads, which is a decent number for an indie. From my perspective, this stage marks his sustainable growth as an indie developer.

BRO'S INDIE CAREER 2015-2019



Timeline: Bro's indie career 2015-2019

- **App Business Models:**

From the case record, it can be seen that Bro has tried different ways to diversify his source of income from his apps. This channels are:

Free Apps with Advertisements:

This type was common in his first games published and now remains an important channel

of revenue. Later on, his strategy has evolved with the introduction of various types of ads (Banner, Interstitial, Native Ads and Video Reward Ads). His ads revenue depends on the number of active users, the characteristics of the users (e.g. the local contexts) as well as the level of user engagement with the apps.

Freemium:

This model is preferred by Bro, as well as many other indie developers in the community, because of its obvious advantages. “Freemium is an ideal way for mobile apps to get more users to download while potentially generating revenue by in-app purchases.” - As Bro has stated. After the implementation of this type, his apps have shown more positive growth and professionalism.

Paid Apps: This is a less desirable channel for indie developers, especially those who focus more on games and entertainment apps like Bro, because game players are generally unwilling to pay upfront for a product that should be relaxing and free. However, this business model still remains its significance in case of highly demanded utility apps, which Bro may still consider in the future.

4.2.2. What are the main challenges that this developer faced in his entrepreneurial process?

Bro has encountered multiple challenges during the period between 2015 and 2019 on his way to becoming a skilled indie developer. These challenges came from both **internal** and **external** factors:

Three Internal challenges: Internal challenges belong to his own skill, mindset, and attitude. By studying his narratives, the three most evident internal challenges can be identified as follows:

- *Lack of technical skills after graduation:* This is obvious in the year 2015. Despite graduating from a well-known tech university in Vietnam, Bro did face a challenge

in the real work life as a mobile developer. No previous exposure to the process of making games is an obvious hindrance.

- *Language skill*: This challenge has been expressed by Bro as a big problem when it comes to other tasks than coding. Because the indie career requires the developer to be fully responsible for all the aspects of his apps, Bro were faced with multiple difficulties in marketing and developing international apps due to his below average English skill, especially in Writing.
- *Persistence and Self-confidence*: Remain persistent and self-confident are undeniably a challenge for Bro, as shown in his tough times. This is a challenge from an internal mindset of an indie developer. He needs to overcome the limit of his own mindset and belief in order to further his career, because unlike working for a company, being an indie means he has chosen the entrepreneurial pathway, which involves risks and uncertainty. In such cases, persistence and self-confidence play the vital role in maintaining motivation.

Five external challenges:

External challenges can be understood as those which come from the outside world, which interfered with the entrepreneurial process of Bro. External challenges can be different from person to person. In the specific case of Bro, I can perceive and identify the five external challenges he have faced:

- *The intensity of role duality*: It is obvious that at the beginning stage, this indie developer cannot sustain his life by solely relying on making indie apps. Thus he had to maintain a two-schedule scheme: working in the day time and working on his own project in the evening. Until the apps started generating profits, he had to maintain the two roles, which were very demanding, physically and mentally. This posed a huge challenge for him in balancing his work and life.

- *The market influence on app ideation:* Finding a good idea for his app is inherently a challenge, not only because a lot of previous apps have already occupied many promising ideas, but also due to the fact that *a good idea to a developer might not suit the taste of the mass public*. As Bro pointed out, after his first app which came from his original interest, he found it difficult to figure out what kinds of the next ones should be. In fact, he had to rely on the idea of other traditional games to just make a product. Evidently, this approach might work in an acceptable way but cannot make the apps unique as when the ideas are both good and can spark the interest of the general community.
- *The balance between quantities and qualities:* During the process of producing apps or “app execution”, Bro struggled to find the balance between the numbers of apps and the qualities of his products. Developing a “perfect” game requires a great time investment, while in order to make a living, an indie has to release a decent number of products in a limited time period. Thus, extra time focused on designing, for example, might come at the expense of product release pace.
- *Cost for marketing:* This is undoubtedly one of the biggest challenges for an indie developer. Although Google, for instance, has taken actions to promote the indie games and support the indie developer community, an indie still has to confront the disadvantage in app marketing, if his own resource is not sufficient. As Bro expressed: “*Frankly speaking, the first and foremost problem in marketing is “money” and how to use that money effectively*”. By spending his own fund to run marketing campaigns for his products, Bro had to face the risks of losing money in case the users gain from such marketing strategies does not return adequate revenue.
- *Google and Apple as “the gatekeepers”:* In the platform-based ecosystems the platform owners such as Google and Apple have greatly facilitated the work of indie developers by handling many aspects of the app development process, including app marketing and product payment. However, Google and Apple also

played the role of the “gatekeepers”, which controlled the rules of the whole ecosystems, which indie developers have to follow. In some cases, this causes considerable constraints. Bro has experienced this during his indie career. For example, some of his apps have been removed from the stores for not abiding by these set rules, even though some of the rule definitions and boundaries are not fully clear.

4.2.3. How has the developer overcome these challenges? The most important qualities of this indie developer that made his progress

Through the story of Bro, one question arising is after this 3-year period of indie app development, what have made him stay with this career and progress? From my observation and analysis along his journey, the top three qualities of this indie developer are (1) Passion for indie apps (2) The business skills (3) The ability to learn and adapt to new things. These three qualities will be outlined below

First and foremost, the passion for indie apps is the biggest difference that differentiates a successful indie developer from others. Bro considered making mobile games as his passion and he described himself as an enthusiastic game player. Thus he came to the career with passion as the first motivation. Passion has driven him through difficult periods of time and motivated him to still make the products regardless of the poor earnings in the beginning. Without passion he could not have overcome the intensive period when he worked as both a 9-5 worker and an entrepreneur. Passion for indie apps also stimulated him to improve his English and marketing skills. This is definitely the top quality of an indie developer.

The second but not less important quality is the business skills of an entrepreneur. As discussed in the previous chapter, an indie developer is an entrepreneur by nature. Thus, without this crucial skill, Bro could not be successful in the indie career. In reality, by improving and adopting different marketing strategies, Bro has grown his apps to a profitable level, with some of his apps having diverse business models and achieving high

numbers of downloads. The business and marketing skill is thus what distinguishes an app entrepreneur from a pure coder.

The third characteristic which is indispensable to an indie developer is the ability to learn and adapt to new changes. As Bro discussed, he believes in the power of life-long learning in the career of an indie. Mobile technology is an ever-changing field and in order to progress as an indie developer, Bro has been keeping an open-minded attitude. The clear evidence which can be found from his narratives and conversation is such quality - the adaptability to new knowledge and technology. Bro has tried different ideas of games according to the trends in the game player community, improved his technical skills as well as attempted to test different business models to advance his apps. This agility has helped maintain his momentum in the indie entrepreneurial journey.

5. Discussion

Single case study research has been criticised for a number of limitations. One of the most prominent criticisms is the validity or generalisability of the research. That is to say, many researchers may question the ability of a single case study to offer any insights beyond that single particular instance. As King, G., Keohane, R. O. and Verba, S. (1994) pointed out “We always do better (or, in the extreme, no worse) with more observation as the basis of our generalization”, and “in all social science research and all prediction, it is important that we be as explicit as possible about the degree of uncertainty that accompanies our prediction”. Although this is undeniably a valid constraint, I would argue that the generalisability becomes less relevant when the initial purpose of a single case study research is to focus on the uniqueness and the particularisation of the case. Furthermore, one should make it clear between explanatory research, which aims to test a theory, and exploratory research, which is designed to understand a particular phenomenon and contribute to theory-building. According to Gerring, J. (2004): “theory confirmation/disconfirmation is not the case study’s strong suit”. Instead, a case study remains its utility when it comes to exploratory research.

The second constraint of this research, which I acknowledge, is the objectivity of my role as an insider research. As previously mentioned, being an insider research brings about a number of advantages but also poses a significant challenge when it comes to the objectivity of my analysis. For example, the researcher may hold a subjective view based on his experience as an insider in the field, thus neglecting other objective analysis compared to a completely researcher-independent method.

Another limitation, which arises during the data collection process, is that, unlike face to face or Video call conversations, story-telling through voice message disables the researcher to see and analyse the interviewee's facial expressions and other body languages. Without this, it is more difficult to understand the feelings and natural reactions of the interviewees. However, the reason why in this study I am still determined with voice call/and voice message interviews is that this approach will allow interviewees to answer and provide the narrative in the most comfortable way. Given that the duration of conversation can reach up to 2-3 hours, voice calls along with audio messages exchange will create a less stressful experience, even though it comes with certain constraints as mentioned above.

6. Conclusion

As a single case study, this research aims to address three questions regarding the entrepreneurial process of a Vietnamese indie mobile developer. The starting point of this research comes from my eagerness to explore how a mobile indie developer in Vietnam has made a business from his own products in recent years. This paper starts by stating the research questions and clarifying the key definitions such as indie, app developer, and entrepreneurial process. In the literature review chapter, I have taken a broad-to-specific approach to highlight important literature on Technology Entrepreneurship, Entrepreneurship in Mobile app development, and then the specific topic of Indie app development.

In the methodology section, I have presented my research method by combining an intensive case study with a narrative research design. The most important methodological guideline on which my approach is based is the book of Eriksson, Päivi & Kovalainen, Anne. (2010). First, I have provided a broad view of the research context - the Vietnamese mobile development industry as well as the Vietnamese indie developer community. Next, I present the subject of the case study and explain how the research data is collected using Facebook Messenger voice messages, Play Store and App Store app listing, and text conversations. Also in this chapter, I emphasize my role as an insider researcher as well as address 10 ethical considerations of business research.

I analyse the case study by synthesising the case record and data in a chronological order. By using a time-series analysis and thematic approach, I make sense of the case study record and propose the answer for the three research questions. In summary, my key findings are:

- Answer for question 1: During the period 2015-2019, the indie developer in this case study has gone through a challenging entrepreneurial process, which consists of five stages: Building fundamental technical knowledge and skills, Developing the first indie products, Facing difficulties and confusion, Getting back on track, and Growing and maintaining the momentum. By the end of 2019, he had well progressed as an indie developer with more than 20 apps and games on the two platforms Play store and App store. His revenues come from three main business models: Advertisements, Freemium and Paid Apps.
- Answer for question 2: This developer has confronted multiple challenges in his entrepreneurial process. These challenges are either internal, namely lack of technical skills, incompetence language skill, and problems of self-confidence, or external, namely the intensity of role duality, the market pressure on app ideation, the imbalance between quantities and qualities, the cost for app marketing, and the constraints by Google and Apple as platform owners.

- Answer for question 3: I found out that passion for indie apps, business skills and the learning ability are the three key qualities for the developer being researched to progress and succeed in his indie career.

In this paper, I have also discussed how my research is both advantageous and disadvantageous by following an intensive case study approach, as well by being viewed from an insider angle.

Overall, this research sheds light on a particular case of an entrepreneur in the field of mobile technology and within the specific context of Vietnamese mobile development industry. Despite being a single case study, my work plays the role of an exploratory research, thus potentially providing evidence and insights for more systematic research into indie mobile development as a form of entrepreneurship.

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