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Game Production and Role of Game Producer

Case study: Research on demographic of gamers in Hanoi, Vietnam

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Bachelor's Thesis

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THESIS
Abstract

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Abstract

This thesis was intended to serve as a guideline on how to manage a video game development process as a producer. The study includes basic knowledge of game production process, focusing more on managing the project as a whole, rather than reaching specific technical aspects. The production methodology described here is a combination of several methods used by most studios in the game industry.

Additionally, understanding of game producer's roles and characteristics was also studied to give author a "mental map" to apply in future career. The goal was to accomplish the most efficient and inspired production process as possible which could be utilized in most cases.

Finally, the demographic of gamers in Hanoi – capital of Vietnam – was studied and analyzed, for the purpose of drawing a conclusion on whether Hanoi would be a potential environment for new startup game development studio in the future. The investigation method carried out was quantitative research; data was collected from online questionnaire and physical handouts.

The theoretical part of this study primarily relied on Heather M. Chandler's knowledge on game production, through the book The Game Production Handbook. In addition, project management knowledge from James P. Lewis's book Project Planning, Scheduling & Control is also used. The theoretical framework of the report contains project management, production and production planning.

Keywords
Video game, production, producer, project management, environment, analysis

CONTENTS

LIST OF FIGURES

1   INTRODUCTION

Over the past ten years, the video game industry has been growing rapidly and becomes one of the most successful industries in the world, generated billions of dollars revenues worldwide each year. Video games are becoming closer and closer to the point are considered as art, not just high art like literatures, paintings or films, but an interactive form of art. From "Pong" to "Mass Effect", video games can get people emotionally invested as well as movies can do, to the point that they are not considered as just "kid's toys" but also a philosophy of life. However, just like a movie, a video game can be terribly bad as a result of fail production. As a gamer, video games have been my passion for over fifteen years; it is my dream and goal to not just play but to be able to produce games that will stay in people's hearts. With that idea in mind, I started to write this study as a personal guideline, hoping it will be helpful for my future career as a game producer.

In this thesis, I will research details of some aspects in game production process, mostly non-technical areas, finding out how games are made, from concept to final product, and focusing as close to project management field as possible. In addition, a minor study on what makes a game producer will be presented afterwards. Finally, the last portion of my thesis is reserved for an analysis of gamer's demographic in my home town – Hanoi, Vietnam.

For this study, I used mostly secondary research (also known as desk research) for theoretical part. The materials were collected from internet sources as well as physical books. The method used to gather information for my final analysis is quantitative research, online surveys were distributed among Hanoi's citizens in Vietnam.

2 GAME PRODUCTION OVERVIEW

2.1 Introduction

In general, production refers to the responsibility of producers, especially in the context of video game development, it refers to project management. More likely, the producers will receive help from their teams, their managers, or other departments, but even though, as the teams grow bigger and budgets increase, they are required to have a solid knowledge of the game production process, how to fit all puzzles together, or adjust the process to meet the requirements of their games.

Game production often includes much more than just plain code writing and programming. The specific process may be different between projects which is why management can be challenging. But overall, it all starts by identifying the initial concept and ends with the launching day, with every step taking in between such as scheduling, audio and visual designing, AI programming, level designing, community services, etc. However, there is a fundamental structure for production process as a whole which can be broken down into four main stages: Pre-production, Production, Testing, and Post-production. Each phase has numerous tasks that must be finished before proceeding to the next one. The success of the game is directly affected by the successful accomplishment of each stage.

2.2 Production Cycle

Figure 1 indicates the very basic of a production cycle, some specific production tasks are not shown for example voice recording, modelling,… due to variation from project to project. The graph describes the objectives of each stage and how each stage is a foundation for success of the following stage. It is also significant to mention the importance of project plan in the pre-production phase since the whole production process is built upon its completion. A project is more likely to come across problems which could have been prevented or prepared for when the plan are not defined.
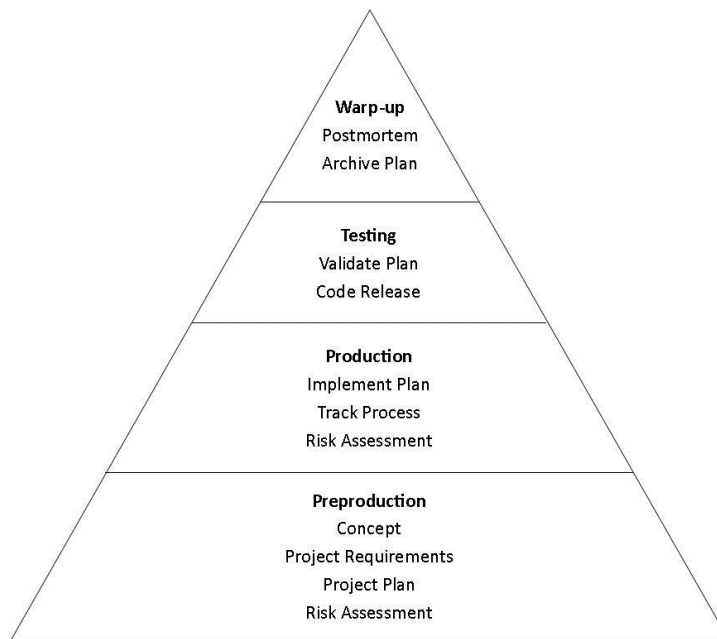
Figure 1. Basic game production cycle (Chandler 2014, 5)

However, this is only a basic view of the production cycle, in some higher stakes projects, it is necessary to have multiple production cycles as the project goes through numerous production process. The same cycle can be used repeatedly in any task in a project in order to meet the desired qualifications. Figure 2 indicates multiple production cycles for a single project. (Chandler 2014, 4-5.)
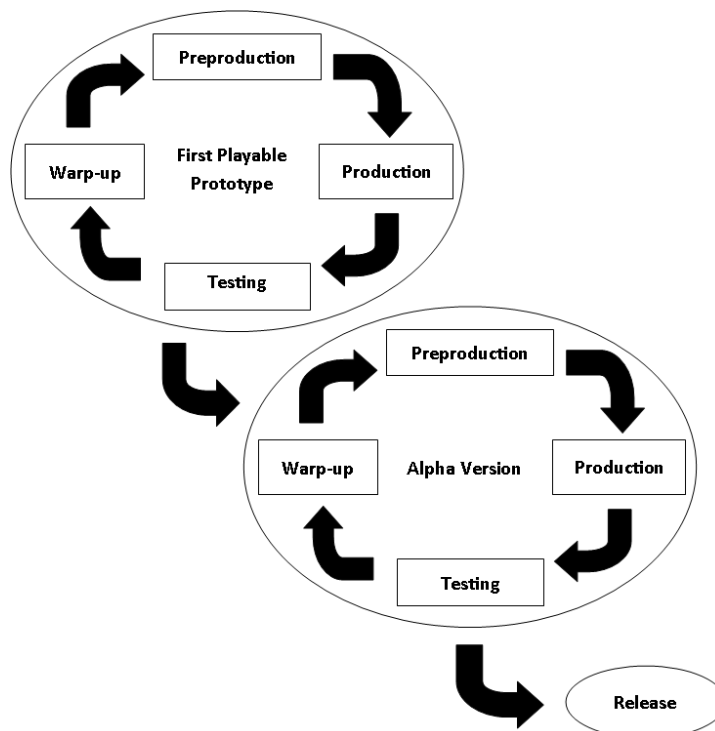
Figure 2. Multiple production cycles for a single project (Chandler 2014, 5)

2.3   Pre-production

The first phase in the production cycle is pre-production with which will define how the game will be, how much time and number of people are needed, estimate the budget for the project. Depending on how long it will take to finish making a game, pre-production requires about 10-25% of the total development time. Therefore, whether it is a six-month project or two-year project, pre-production could last any-where from a few weeks to even more than a year.

The aim of pre-production is to create a game plan, which should include information on the game's concept, requirements, scheduling, staffing, and budget. Pre-production can be broken down into three parts: game concept, game requirements, and game plan.

2.3.1   Game Concept

Initial Concept

Before getting into development, the team which likely consists of producer, lead de-signer, engineer and artist often starts with defining the concept of the game. The concept will determine what the game is about, it can start with a broad idea, then getting narrowed down by adding more details like the genre, platform, key features and mechanics, etc. creates a high concept for the game. This session is for the team to communicate and share their ideas in the most efficient and enjoyable way. Once the game's concept is defined, it should give anyone presented with the information an overall understanding of its goals. (Chandler 2014, 131.)

By applying knowledge of product development projects from *Product Design and Development 4th Edition* by Ulrich & Eppinger (2008), game's concept can be classi-fied as four types:

- ***New product platform (Market Penetration)***: "*Creating new family products based on a new, common platform*" – This applies to games that share the same genre but with different storylines, characters, settings… This type is particularly suitable for a genre where the game needs to be differentiated in order to remain competitive. For example, the FPS - genre has always been a challenging environment for new games to compete as there were many big

titles such as Call of Duty, Battlefield, Counterstrike… dominating. However, during the time period of this thesis, a new FPS - title called Titanfall is released, bringing new experience for players with features like jetpacks and mech-suits. According to the press, It has potential to rival and even coexist with the likes of Battlefield 4.

- ***Derivatives of existing product platforms (Market Development)***: "*Extending an existing product platform to better address familiar markets with one or more new products*" – This can be related to franchises that has the same characters, same atmosphere but with different genres. The most notable examples would be the game company's mascots such as Mario, Sonic from Nintendo and Sega. The original games starred these two characters were simply 2D platformers, but as the game industry expanded over the years, they appeared in many different genres like sports, racing, puzzle, etc.

- ***Incremental improvements to existing products (Product Development)***: "*Adding or modifying some features of existing products in order to keep the product line current and competitive*" – Mostly, these are famous successful franchises or exclusive titles with big budget which are often released yearly (e.g. Madden NFL, Pro Evolution Soccer, FIFA…). Sometimes, only a few minor changes are made and some updated content is delivered. Games like these are easier to develop due to existing structure, but still draw attention from gamers because of the updated content.

- ***Fundamentally new products (Diversification)***: "*Involving radically different product or production technologies and help to address new and unfamiliar markets*" – This indicates new game entered the market with completely new genre. Usually this type of projects involves more risks, but if done right, the success can be surprising. For instance, League of Legends which was a pioneer in the MOBA / ARTS genre was Riot's huge success, raking in $624 million in revenue in 2013, according to SuperData Research.

To understand the risks of each type, we can refer to the Ansoff matrix as shown in Figure 3:

```
New  ↑
      |
      |   ┌─────────────────┬─────────────────┐
      |   │                 │                 │
      |   │    Market       │                 │
  M   |   │  Development    │ Diversification │
  a   |   │                 │                 │
  r   |   ├─────────────────┼─────────────────┤
  k   |   │                 │                 │
  e   |   │    Market       │    Product      │
  t   |   │  Penetration    │  Development    │
  s   |   │                 │                 │
      |   └─────────────────┴─────────────────┘
      └──────────────────────────────────────────→
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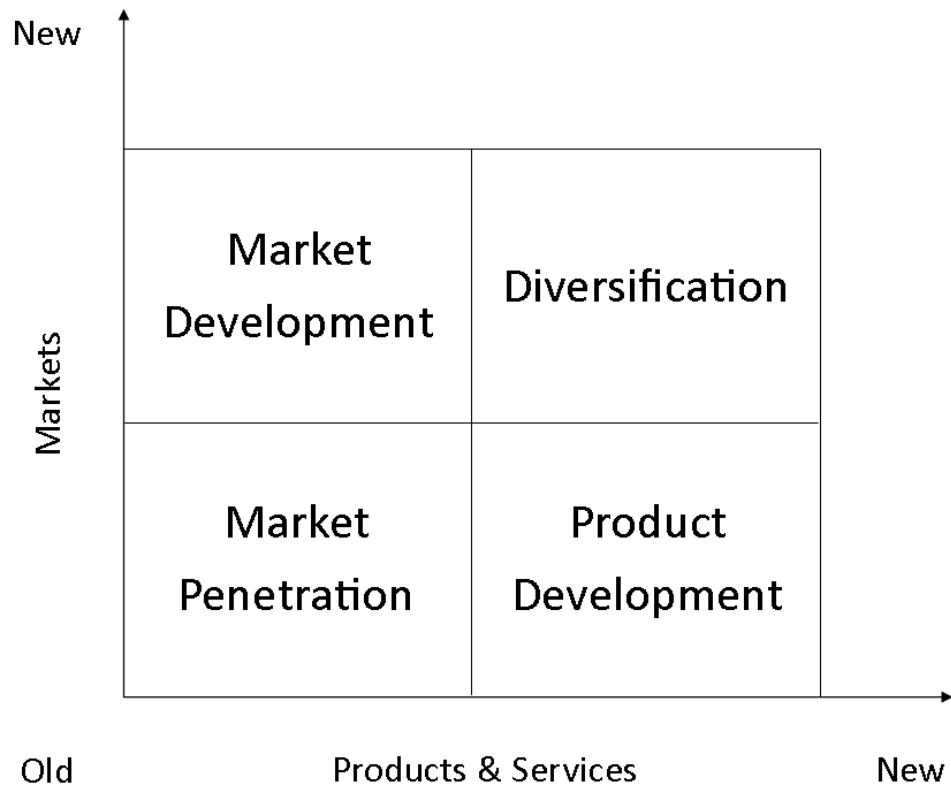Old   Products & Services   New

Figure 3. Ansoff matrix

The diagram demonstrates the risk that a particular strategy will expose the game concept to. The idea being that, each time you move to a new quadrant, you increase the risk. However, the producer rarely decides the initial game concept and general game design alone or without any authority. Typically, this is a collaborative process between developer and publisher, the producer's key role is to make sure the project meets its goals. But it is important for the producer and development team to know what obstacles will lie ahead when a concept is chosen, by analysing the risk of each concept type.

SWOT Analysis

Additionally, the planning process of a project cannot be completed without a SWOT analysis, which stands for Strengths, Weaknesses, Opportunities, and Threats. SWOT analysis can be divided into two categories: internal influences (Strengths, Weaknesses) which the team has some control over and external influences (Opportunities, Threats) which are beyond controllable. Figure 4 illustrates topics to consider when doing SWOT analysis or game development.

Strengths	Weaknesses
• Core features	• Lack of team experience
• Innovative features	• Lack of competitive features
• Player capabilities	• No innovation
• Unique selling points	• Platform choice
• Production values	• Poor company reputation
• Licensing tie-ins	• Financial issues
• Price points	• Schedule and deadlines
• Appeal to demographics	• Resource availability
• International appeal	• Lack of team morale
• Potential revenue streams	• Poor leadership
• Marketing tie-ins	
• Franchise tie-ins	
• Console bundle potential	
• Multi-platform potential	
• Team experience	
Opportunities	**Threats**
• Lifestyle or industry trends	• Political influences
• Technical innovations	• Competitors' strengths
• Market trends	• Competitors' release dates
• Competitors' weakness	• Waning market demand
• Globalization	• Loss of key staff
• Target market	• Loss of financial backing
• Niche target market	• Technical innovations
• Partnerships	
• Middleware trends	
• Release dates	

Figure 4. Possible topics for SWOT analysis (Chandler 2014, 138)

By doing SWOT analysis, the team should be able to understand how to exploit strengths and opportunities, and neutralize weaknesses and threats. The SWOT analysis should be updated throughout production as it is a part of the game plan.

Detailed Concept

After the initial concept is approved by the stakeholders, the team continues to outline the detailed concept, commonly by lead designer and lead artist. The material provided during this period should conclude the following information:

- **Mission statement** describes the main goals of the project, what needs to be done and who it is being done for.
- **Game setting** affects the game's environment, characters, objects, and other part of the game world, in other words, the look and feel of the game.
- **Gameplay mechanics** include any portion of in-game actions, how the game will be played. Examples for gameplay mechanics are: control scheme, player's actions, rewards and achievement system…
- **Storyline** helps players fully experience the game world. A story is the means to differentiate good and great game, and it must integrate with the gameplay mechanics, game setting, and characters.
- **Concept art** presents the visual aspects of the game before artistic resources are created.
- **Audio elements** are as important as story and visual elements; together they help further immerse the player into the game world. (Chandler 2014, 142-145.)

Prototype

When the concept is fully defined, a demo or prototype should be created as it is a key factor in game development. A prototype does not necessarily need to be as polished as the final game; the point is to test its mechanics and gameplay before developing the real game. Prototypes are usually used as *learning tools*, to understand the functionalities and the purposes of the game. They also serve as *a communication medium,* among team members, managers and stakeholders. Furthermore, it helps integrate mechanisms with subsystems of the game, and also the perceptions of different sections in the development team, for example, a simple playable demo can be used as a proxy through which the design, marketing, programming departments agree on a basic design decision. More often enough, before the project is allowed to proceed, upper management may expect a prototype that shows particular working functions. Especially in later phases of the development process, prototypes are *milestones*, determine progress, provide tangible goals and enforce the schedule. (Ulrich & Eppinger 2008, 250-253.)

Prototyping commonly results in two kinds of output called the "vertical slice" and the "horizontal slice" as shown in Figure 5. Vertical slices are used to test a fraction of

overall gameplay, including a piece of every element (code, audio, art, etc.). In contrast, a "horizontal slice" prototype contains only parts of a single aspect of the game. For example, designers could have complete animation assets, but no audio assets. (Adams & Dormans 2012, 15-16.)

Vertical Slice

Entire Project

Art/Animation Assets

Horizontal
Slice

Audio Assets

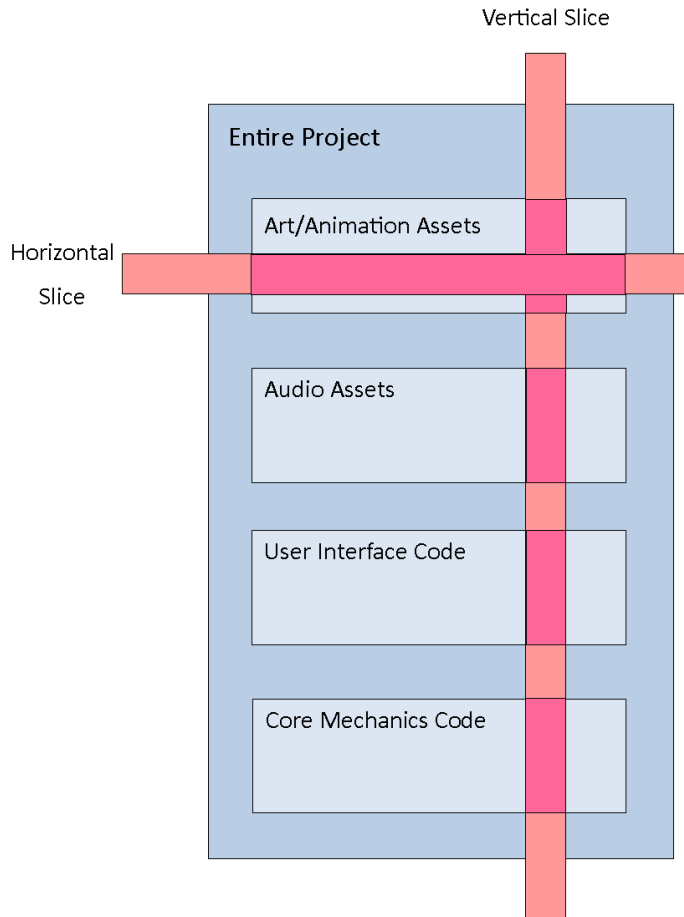User Interface Code

Core Mechanics Code

Figure 5. Vertical slice and horizontal slice of a game project (Adams & Dormans 2012, 16)

As idea and prototype are approved, entering the next stage of pre-production of the project, determine the game's requirements.

2.3.2   Game Requirements

During this phase, major decisions will be made about the requirements for the game to be completed. Frequently, development team simply might not have time to include every desired feature, or some features will not fit with the game's idea. Therefore, core features need to be prioritized based on different levels of implementation. In addition, milestones are set to mark major accomplishment during development and

track the progress of the project. Expected deliverables are established for each milestone to define whether it is completed. Generally recognized milestones are:

- **Alpha**: At this point, the game is theoretically playable and all key features should be included. The implemented features may be further reviewed by testing results and feedback.

- **Content complete/Code freeze**: This is the stage when developers focus on perfecting existing assets. No additional code is added and only bugs are being fixed from this point onward.

- **Beta**: At this milestone, the code and other assets of the game are completed, nothing new is added and no changes are made to existing features and functionality unless it is identified as bugs. Testers will be continuously working on the game, searching for bugs and flaws. Some games, especially MMO (Massive Multiplayer Online) type, have a selected group of customers to test the game in "open beta" programs. For the development team, this period is about bug fixing, optimizing, and polishing the game.

- **Final/Code release**: After all bugs are addressed, the content is commonly locked down, no new assets will be added and developers are ready to ship the game or submit it to console manufacturer for approval. This version is tested by QA (Quality Assurance) department consists of staff dedicated to game testing, using the QA test plan. (Chandler 2014, 157-159; Dunlop 2014.)

The technology used to develop the game is also evaluated in game requirements phase, depends on the game's features, resources and schedule. Engineers will decide to use either technology with which they developed themselves or use an existing licensed software package. Each choice has pros and cons, but whichever is chosen will affect the budget and schedule of the production directly. Along with evaluating the technology will be used, the team will work together to define tools and production pipeline. Carey Chico, Art Director of Pandemic Studios stated: "*One of the necessities of game development is a solid tool strategy. You must have a core group of engineers who are dedicated to tools programming on your team. They can enhance the proprietary tools that are part of your pipeline by upgrading features, fixing bugs, and adding new features based on the game development process.*" (Chandler 2014, 162-166.)

In the end, documentation included details on all major aspects of the game must be completed in order to help designers understand how to implement the feature.

2.3.3   Game Plan

This is the last phase of the pre-production and also is the most important, where all the information gathered from previous stages pulled together. A plan is created to determine three critical elements: schedule, budget, and staffing, without it producer cannot manage the production efficiently.

Schedules

One of the most important items producer manages that will keep the development process on track is the schedule. It includes task list, estimated duration for each task, the person responsible for the task. Scheduling can be done by using Gantt chart, WBS (Work breakdown structure), Kanban principles or by using other type of scheduling software like Microsoft Project® to make tracking the tasks easier. The whole team should be involved in creating the schedule, this makes team members have more ownership over their tasks and take the deadlines more seriously.

Jack (2013) describes in his book *Engineering Design, Planning, and Management* the steps for scheduling a project as follows:
  (i)   List all the main phases and milestones of the project. Milestones must have measurable outcomes to end and start the project phase.
 (ii)   Divide the tasks which identify work, time, and resources under each project phase using WBS.
(iii)   Identify task sequences (in parallel or in series).
(iv)   Determine start and end dates using the task sequence and duration.
 (v)   Verify that resources do not overlap.
(vi)   Adjust start times to meet all of the constraints and objectives.

One thing to be expected is that during the development, schedules might get changed; however, the same tasks still need to be done. Furthermore, schedule changes must be updated as soon as possible for tracking purposes.

Budget

Besides being in charge of scheduling, the producer is also responsible for managing the costs of the project. In order for the game to make a profit after it is released, the budget must be sufficient for its scope, schedule, and quality. Planning all the costs related to the project, including overhead, personnel, hardware, and software, will

decrease chance of countering surprises during the development process. The producer can refer to the schedule and game requirements crafted in previous phases to create the costs plan.

A project budget can be approached using combination of three following methods:

- Top-down budgeting: Total costs are determined by higher management before allocating divisions between each cost sector. This method is useful when the material costs are rather high.
- Bottom-up budgeting: In opposite of top-down budgeting, this is the approach where smaller costs are estimated then combined to calculate the resource needed for the project.
- Speculation: Use history and knowledge of similar projects to estimate costs. (Jack 2013, 258.)

In reality, each game project will have a different budget, but there are common things to be considered during budgeting process. Figure 6 lists some of these items. Each department in the figure can be broken down for further detailing.

Personnel Costs
Art Personnel
Design Personnel
Engineering Personnel
Production Personnel
QA Personnel
Audio Personnel
Other Major Costs
Hardware
Software
IP Licensing Fees
External Vendor
Food
Shipping
Office Supplies
Overhead (HR benefits, insurance, office space, etc.)

Figure 6. Major budget line items (Chandler 2014, 191)

Along with schedule, producer needs to keep track of the project's budget as it might get over extended. There will be times when unexpected costs arise; therefore, producer should be able to reallocate money without increasing overall budget.

Staffing

The staffing plan determines who will be responsible for what job in the development process. The plan is mainly based on tasks listed in the schedule; for that reason, there is strong connection between staffing plan and schedule. Budget also plays an important role in planning personnel, for example, if the task requires extra people to be completed, the budget should be enough to do this. On the other hand, if the project cannot afford additional people, then the scope of work will need to be reduced in order to complete the project on time and at budget. A staffing plan is fully defined when there is a good balance between the tasks to be finished and people needed. (Chandler 2014, 188-189.)

After the game plan is finished and ready for approval, the team should have a clear idea of what to be expected in the future development. Overall, one of the biggest challenges in managing the development process is to control the dependency between schedule, resources (staff and budget), features, and quality. Whenever one of these factors changes, the others will be affected, making the project unstable and at risk. Yet, these factors will fluctuate during production, but with a carefully crafted plan, the team can be prepared to deal with changes and make proper adjustments.

2.4   Production

If the project was planned carefully, there should not be many unexpected surprise during the production phase. The objective of this phase is to implement the plan made in the previous phase and get the game shipped. The development team will focus on creating content, implementing code, and completing tasks listed in game plan as well as tracking the progress. In short, production phase is a transformation process from prototype into full functioning game, and the producer's job is to ensure everything goes smoothly and everyone is working together like a well-oiled machine.

As mentioned in 'Game Requirements' section, by the time production starts, design documentation on major aspects of the game has been completed. During the production phase, designers will work with gameplay features and gameplay builds, whilst making sure that artist and programmers implement the details of designs

properly. Designer's job is also to tweak and polish an implemented feature until it is perfect. Therefore, play testing is very important in design production cycle, it helps designers determine whether a feature is completed. Meanwhile, artists will focus on art assets creation: character, environment, objects...essentially everything visual in the game. Following the schedule and tasks list provided by leads, each artist will have appointed deliverables to deliver by given deadlines. At this point, art prototypes are still being created. Even when the game is not running, although concept art or prototypes will not solve technical problems, they can help shape a vision on what art features should be included in the game. On the other hand, programmers will be spending time getting code running and making builds. Programmers are the ones closest to QA as they work together to identify errors and debugging. The three departments will simultaneously give feedback to each other as the game is developed. As a result, good relationship between design, art, engineer, and QA will improve efficiency of the process. (Edwards 2006.)

2.4.1 Progress Tracking and Project Review

Keeping track of the progress is crucial in any project; it prevents the project from getting out of control and reduces risks. Progress tracking is not necessarily complicated; however, regardless of the used method, the whole team should be aware of what progress has been made (Chandler 2014, 11). In order to monitor the development process, the producer must keep in mind four constraints that will impact the measurement of the project: time, cost, features, and quality. James Lewis (2005) describes in his book *Project Planning, Scheduling & Control* the relationship between these variables as an interdependent triangle shown in Figure 7. The idea is that each time one measurement of the triangle changes, it will affect the others. For example, if the time needed to complete the project extends too long, more resources will be used. If features of the game are cut too short, end quality might not be as desired. Maintaining balance among these factors is always a challenging task, however they're also fundamentals for getting the project back on track.
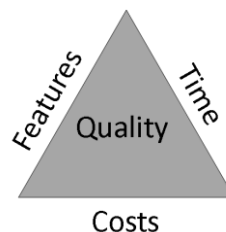

Figure 7. Relationship between project variables (Lewis 2005, 16)

Conducting project reviews regularly is vital in managing the game development. Not only it helps detect problems and formulate solutions but also is a key communication channel to the state of the project between the producer and the project leads. The review requires the team to compare the actual development progress with the established plan. The purpose is to improve performance of the team by learning from experience throughout the progress. There are three kinds of project reviews: *status* – evaluates the status of four project variables (quality, time, costs, and features), *design* – examines the product, service to see if it meets requirements, *process* – reviews process and see if it can be enhanced (Lewis 2005, 375). The following information should be included when creating a review format:

- Comparisons between the current project's status and the project plan, what milestone has been achieved so far, how it was achieved, and much of the budget has been spent. In addition, accomplishments since the last review can also be listed to show the concrete progress of the development.
- Analyze of potential risks and suggest resolutions.
- Identify roadblocks that will prevent the team from making progress.
- Updated documentation on project schedule, deliverable lists, status report, etc.
- Evaluate additional resources needed as the project continues. (Chandler 2014, 215-216.)

By getting feedback and approvals when reviewing the project, the development team can move the progress forward. Tracking and reviewing are parts of the control cycle that exists in every project. The concept can be described in the following figure:
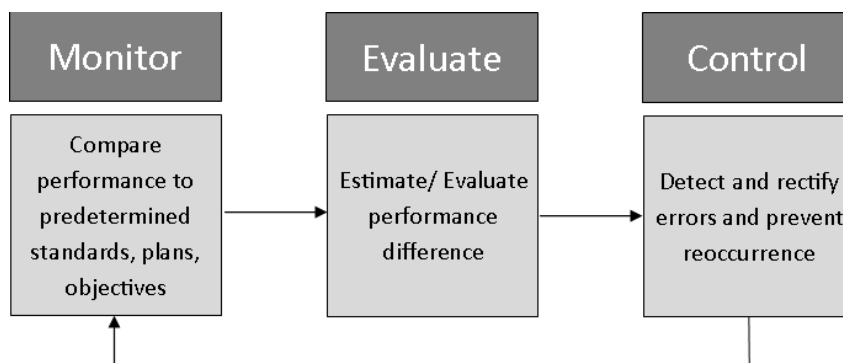

Figure 8. Control Cycle (Passenheim 2009, 72)

2.4.2   Builds and Making Builds

"*The game build is a demonstrable representation of the code that you can run off a test kit version of the target hardware*" (Cohen & Bustamante 2012, 237). Game build is the key tool in progress tracking and reviewing of a game development project. It gives the team and involved parties the opportunity to view the functionality of the game in action, and whether its contents are displayed correctly. The build process is defined during pre-production, and usually implemented as soon as assets and code are accessible. Creating a build can help the developers discover critical bugs that prevent the code from compiling.

Ideally, builds are made regularly and even upon request after production starts. The team works closest to game builds is QA, also referred to as testers. They are responsible for examining the builds, searching for bugs and ensure the game functions properly. Often it takes QA several days with each build to thoroughly test all aspects of the game. As the code release milestone gets closer, QA department will have to work with more frequently submitted builds. It is more convenient to hire a data manager to oversee the build process as well as to have a build schedule ready at the beginning. The data manager and QA will work together to set the delivery schedule for new builds and determine which processes can be automated in order to organize the build process. (Chandler 2014, 225-227.)

2.4.3   Risk Management during Production

In a project, risk is anything that may has chance to create adverse effect to the project variables (time, cost, features, and quality). No matter how well you plan, there always is something that will go wrong along the way, especially during production. Therefore, it is best to identify those threats and plan beforehand. Not all risks are avoidable, but managing them can at least reduce the impact they have on the project (Lewis 2005, 304).

These are some problems Cohen & Bustamante (2012) listed in their book *Producing Games* as potential risks in game development:

- *Scheduling issues*: The larger scope of the project is, the harder it is to distribute workforce and time effectively. The best way is to involve as many parties as possible in reviewing the scheduling process, even those outside of production. Aside from production's schedule, the producer also need to be

aware of Operation Department's and other department such as sales, marketing, and PR as they are all depended on the production process.

- *Unexpected delays*: Team members are people too, sometimes their lives get in the way. Illnesses, injures, family emergencies…are events that hard to foresee, and there is hardly a way around them. In this case, the milestone schedule should be designed with the flexibility to switch deliverables between portions of the game so that the milestones deliverables are still fulfilled.

- *Date changes*: Changes in release date are often caused by various factors with different levels of involvement with the development team. If the game is based on a movie, its release date is highly dependent on the film date. In case the film date is pushed out then there is not a problem, pulling it in might affect the release date of the game, result in feature cuts, rushed crunch mode or even worse. Preventative measures for this should be taken as many as possible by the publisher. Sometimes reason the date gets changed may lie within the publishing office or more often within the development team itself. It is the producer's responsibility if the team is too behind schedule, besides building a realistic and flexible schedule; producer also needs to work things out with team members whenever there is problem in their work causing the delay.

- *Technology*: Compatibility issues, outdated tech and skills, delays in engine upgrades, broken builds, memory issues…are common technological problems arise during the game development. The tech director will need experience dealing with these difficulties and have strategies for preventing them.

- *Changes in direction*: When the project is not going well, dramatic changes may be made, which will usually create even more problems and the best thing you can do is to make the game right the first time around and not mess up.

In addition to traditional method of planning in which the profit margin is estimated by considering costs and revenues, another way is to plan the project in the opposite direction which requires you to state expected profit up front, before proposing any costs or revenues. This method is called *discovery-driven planning (DDP);* it focuses more on learning experience of the planning process, asks us to distinguish our knowledge and our assumptions. More details on this approach can be found on article Managing Risk in Video Game Development by Paul Tozour (2013) on website www.gamasutra.com.

2.5   Play testing

Testing is one of the most important parts of game design and also one of the hardest things to do well. Oftentimes, due to tight schedule of the game development process, testing is rarely strengthened or completed thoroughly. Since testing time is frequently the first aspect to be cut short to accommodate other slips in schedule, test plans and testing timetable should be made during pre-production. Developers and QA department are responsible for creating a test plan for how the game will be tested. Test plan is basically based on the resources and outlined of the up-to-date game plan. Generally, testing is conducted throughout the development of the game and it is never too early to do it. As soon as there is a prototype, or even just squares moving around on the screen, they could be tested. The effort is to polish and refine in order to have a properly working game.

2.5.1   Test Cycle

Testing games is a repetitive process because different build has different bugs and may fail the test. Therefore, similar to production process, testing is also a cycle with four major steps:

- Tester (QA) discovers a bug during play test and reports it into database.
- The bug is assigned to specific developer to be fixed and will be marked in the database when it is finished.
- Tester gets a new build to play test and verify if the bug has been corrected.
- Closed out: QA manager confirms that the bug is no longer exist, the fix is working properly and there is no need for the bug to go through another testing pipeline.

Figure 9 is illustration of the basic cycle of game testing. Basically, a new build is produced after each testing cycle; therefore, not every build will be fully tested, instead QA will only focus on particular sections of the game for each build, sometimes they will cycle through sections of the test plan over the course of a few builds. Because if QA perform testing at the beginning of the test plan for every new build they receive, the amount of testing would not be balanced among some parts of the game (Chandler 2014, 240).
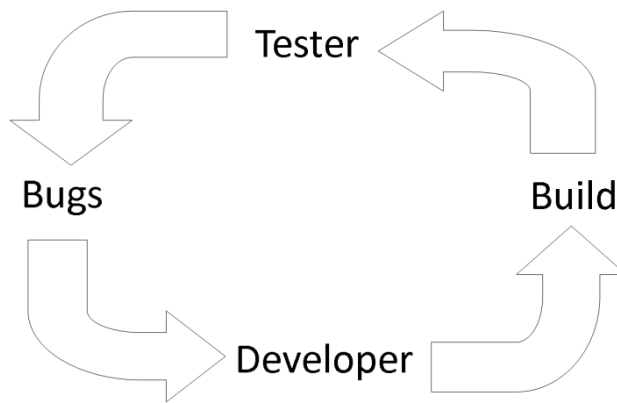
Figure 9. Testing Life Cycle (Redavid & Farid 2011)

2.5.2 Testing Strategy

Testing can be categorized as "black-box" testing and "white-box" testing. Although they have a common objective and the same overall processes (planning, design, execution, regression and reporting), but they focus on different aspects of the game:

- "Black-box" testing focus on the functional or playability of the game. There is only little information or none at all about the internal software; tester will experience what end-user would experience, such as the user interface, graphic and animation of the game, or the actual gameplay. For black-box testing, the tester must know how to play the game: the rules, game flow, or the use of control, etc.
- "White-box" testing, on the other hand, tracks activity of the software using internal function or another software suite, providing information to tester when needed. For examples, rendering engine, sound, AI engine, etc. For white-box testing, tester must understand what coding is.

Testing is neither a single person's responsibility, nor exclusively the duty of the Software and Game Tester in a game project. Every member of the project team is responsible for the quality, accuracy and completeness of the job that he/she does. Furthermore, the testing methodology is considered as an integral part of the game pre-production and production processes. (Scrib 2008.)

2.5.3 Alpha and Beta Testing

Play testing also heavily sticks to the project's milestones since each highlight requires most recent working version of the game to validate. Two common milestones are alpha and beta which typically used by commercial game development compa-

nies. The alpha version of the game is created when the actual development of the game is in progress. Main purpose of alpha test is for the game to be played from start to finish and revise it. Therefore, usually when there is a complete build of the whole game with temporary art and other media, the team should start alpha testing and it is important to follow the test plan. Beta testing starts after alpha phase, when the game feature is completed: user interface, rules and AI are final, final artwork and audio are implemented. The main focus is only on fixing remaining bugs as well as perfecting the game. Regularly there are different kinds of beta versions depends on requirements of the development team. There are internal beta versions for internal testing among project team members; also there may be private beta versions which are given to individuals who developers want to test the system or whose opinions developers value (e.g. family members, friends, company leads…). Then there are public beta versions (also known as Open Beta) where they are tested and com-mented by enthusiasts. Beta versions are also considered as candidates to be gold masters of the game. (Iuppa et al. 2012, 320; John 2013.)

Once alpha and beta tests are done, all the bugs are addressed, content is final, the game is code released. The agreement between the development team and QA de-partment about when the game is ready to be submitted to third-parties (publisher, manufacturer, etc.) determines the code release process (Redavid & Farid 2011).

Overall, from the outside, game testing seems like a pleasing task, you get paid to play video games all day. However, only people involved in testing understand the hardness of this stressful job. Most of the time, testers have to spend hours, days after days playing a section of a game again and again, looking for issues, confirming fixed bugs, they do not even have the time to actually play and enjoy the game. After few weeks, no matter how fun the game is, it will become very tiresome. Any new bug will delay the release date of the game, tensions will be added up as the deadline is coming closer. Nevertheless, as long as testing is planned carefully and constantly monitored, there would be less pressure on the team.

2.6   Post-production

Before the game development process is officially finished, it needs to be wrapped up, hence the post-production. Unlike the wrapping of a film project which is usually included parties, celebrations, premieres…upon finish, most of the time game pro-jects wrap quietly. By this time, everyone is exhausted from stress during developing and above all, testing the game. At this point, only particular team members will re-

main to continue working on updates and future downloadable content (DLC) if necessary. The main objectives of post-production are creating closing kits and completing postmortem.

Archiving / Closing Kits

Simply put, archiving is the task of organizing all source code and assets of the game in order to safely store it for future retrieve like updating content, creating patches, develop sequel or remaster the game. Closing kits may also be used to localize the game by foreign distributors from other countries. The contents of as archive should include:

- Assets: All of the text, audio, art, cinematic assets of the game. These are very important as the game being localized because they are the main factors to be translated into foreign languages.
- Game code: Referred to as source code, is required for creating patches, updates for the game.
- Documentation: Basically any paperwork produced throughout the project. This includes legal documents (contract, approval…), design documents (core asset), technical documents (bug reports, checklist, test plan, walkthrough…), etc.

Creating a closing kit may be a time consuming step, but it is important to have all the items for building the game in one safe place. It is also better to have multiple copies of closing kit so that if anything happens to the original, there is a backup. (Cohen & Bustamante 2012.)

Postmortem

Postmortem is an opportunity for everyone involved to discuss the ups and downs of the project and learn from experience so that they can improve in future productions. This is also the time to celebrate the game's completion among team members. Lead of each team and department is requested to present certain number of successes and shortcomings their team faced during the project and put all together in a closing postmortem document. Listing what went right and wrong seems like a simple task, but in reality it can be quite difficult and it demands fair communication skills of people involved. Without fairness in communication, members will start finger-pointing and blaming each other. Postmortems are only tools for learning, so it is not a problem of who has done what wrong, it is what we have learnt from the mistake and how

we could have done better that matters. General questions asked in postmortem course are: Were the goals of the game achieved? Were the plan, resources, and quality sufficient for the set goals? What went right and what did not? What are the lessons we have learnt? (Cohen & Bustamante 2012.)

"Those who do not learn from the past are doomed to repeat it" - The saying has never been wrong even till today, it strengthens the purpose of postmortems as learning tools. However, there are still common mistakes that even big companies made repeatedly over and over again. Sheffield (2009) listed these slips on Gamasutra.com as his research on Top Ten "Wrong" in video game development:

- Content added too late
- Poor communication
- Clash between schedule and scope of the game
- Number and integration of hires
- Juggling projects, lack of leads
- Lack of technical documentation
- Outsourcing
- Lack of time and details in polishing
- Poor tool implementation
- Crunch time

In the end, there will always be problems showing up during development; after all team members are just people, they are bound to make mistakes. The important thing that counts is to realize one's own mistakes and have the will to correct it.

For the game to be finally delivered to end users, it needs to come through several more processes such as software ratings, localization, marketing and public relations. However, these obligations may vary from projects to projects and often performed by a third-party; therefore they will not be addressed in this study. The next chapter will provide a general overview of the producer roles in production team and what it takes to be a producer.

3 ROLE OF THE PRODUCER

3.1 Introduction

In the game industry, production failure is one of the most common things to sink project, or turn crunch time into a death march. But in fact, not so many people come forward with producer career in mind. Far more students are itching to be designers and it is not that hard to understand why, production has not been mythologized in popular culture quite the same way design has. Maybe that is not a bad thing but it does mean that often even people who want to become producers only have a vague and nebulous idea what producer does. Even the industry does not have a clear consensus on what producer does. Every studio treats them a little bit differently and breaks down their responsibilities in different ways. On that note, this chapter will take a closer look at one of the game industry's less-appreciated roles: the Producer, and what it takes to become one.

3.2 Producer in general

As said, there is no general agreement of what producer does, but there is one thing remains constant in almost every studio out there is: being a producer ultimately means being a project manager. The producer is responsible for keeping the project on schedule, within budget and at the highest quality as possible. Typically, the producer represents the team to other corporate entities such as publisher, investor, manufacturer and seller, involving activities like negotiating contracts, licensing and such. The producer manages development plan, neutralizes risks that influence the plan, and steers the development team to hit milestones. (Scolastici & Nolte 2013.)

However, being a manager doesn't mean being a boss but a facilitator. It is a producer job to make sure that as many people on the team are as effective as possible at all times. This can mean anything from helping people communicate more easily to picking up takeout when people are working late. The producer will have a little bit of a higher level view of the project than most of the developers, so it's his/her responsibility to help smooth over the parts of production that people in the production line might not even see. Although a producer is the most involved and heavily responsible person in the development team, but it is not his/her role to make development decisions on creative content and game features. (Rohlfing 2011.)

Depending on the needs of project and structure of the development team, producer can focus on various fields. Two of the most distinctive roles are developer producer and publisher producer.

- A developer producer directly oversees the internal development departments such as engineering, art, designing, and quality assurance of the project. He/she will work closely with each department leads to create and update development plan and involve in everyday production of the game.
- A publisher producer, on the other hand, supervises other external departments like marketing, sales, localization, and quality assurance. Publisher producer represents the publisher's interests, as well as managing external developers and he/she can also handle multiple projects at the same time. (Chandler 2013, 19-20.)

The following is a diagram of the developer and publisher producer's main points of contact combined.
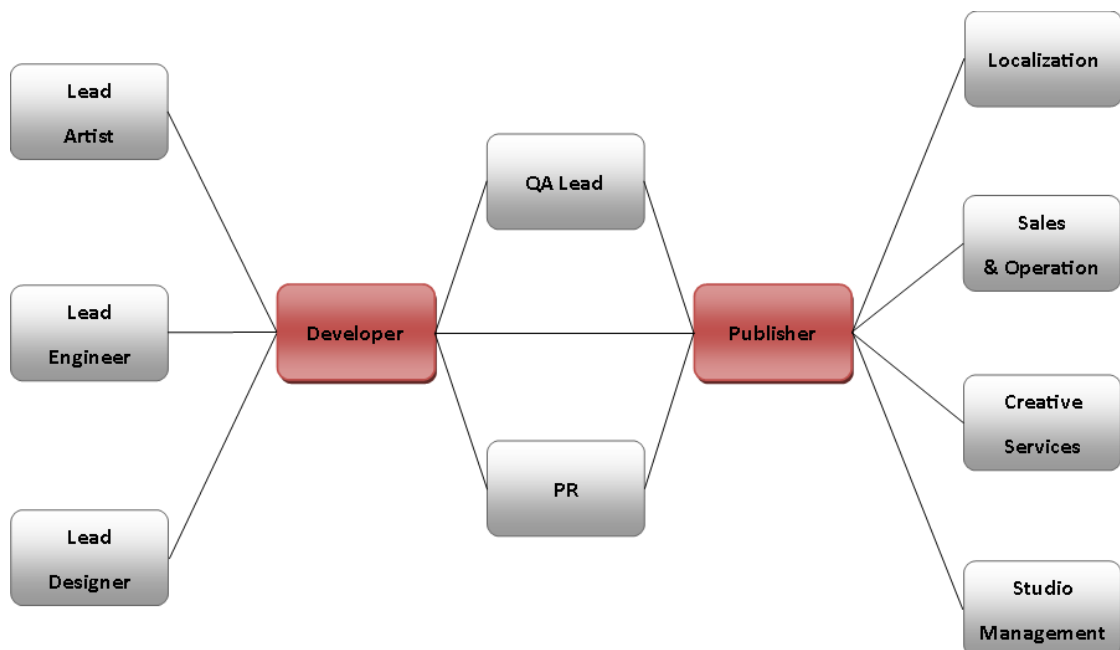
Figure 10. Main contacts of Developer Producer and Publisher Producer (Chandler 2013, 19-20)

3.3   Associate Producer

There are two different understandings of the term "associate producer". The first is to describe a person who works under the supervision of producer, performs production-related tasks given which the producer either cannot handle alone or have time

to assign. If there are two production companies involved in a project, the title of associate producer will be given to the head of the smaller company. However, the associate producer in this case acts more likely as a junior associate than an assistant. Either way, associate producer's jobs are similar to producer's involving all aspects from pre-production to post-production. (Cohen & Bustamante 2012.)

Merric Shank (2014) – Former Producer at Glu Mobile - stated in his interview on website gameindustrycareerguide.com few things that an associate producer will most likely be doing on a basis as: giving feedback on the game, working on the game schedule, attending meetings, and facilitating communication and problem-solving. He also mentioned how he worked up to be associate producer by starting as QA staff. His point emphasized on how the organizing skill being more important than expertize in programming or designing. From his experience, an associate producer should be capable of communicating with team members, having solid working knowledge of Microsoft Office and scheduling methodologies, and being patience to be able to succeed. (Bay 2014.)

3.4   Executive Producer

An executive producer is a step up from producer; standing at the top of production chain, executive producer usually has many years of experience and often manages multiple projects. They have the final voice in decision making as they work directly with corporate, reporting status updates and justifying changes. Beside their main function as manager of the project, executive producer focus on broader production tasks like negotiating contracts, evaluating external retailers, researching hardware and middleware, etc. to make sure the game development process runs smoothly and efficiently.

As the leader of the project, executive producer normally provides input on all aspects of the game development by examining potential problems and approving solutions of the project. However, in some cases, executive producer often does not involve in everyday processes of the team as well as correspond with department leads regularly since that is the producer's job. (Chandler 2014, 18.)

3.5   Background and Training

In game industry, producers can come from different backgrounds; some started as game developers and worked their way up, whilst others transferred from another

industry. Therefore, there are no established principles for what specific skills producer must have. Producers came from technical areas can be more effective in pushing the technology during development, others with artistic backgrounds can contribute more for design features of the game, or some other producers can be most efficient in managing the development process as a whole and motivating people. Nonetheless, there are few characteristics that any well informed producer must possess:

- **Leadership skills**: Understanding how to lead efficiently can be a challenging task for many managers, especially in game industry. A producer with strong leadership know how to keep teams and individuals motivated as well as find solutions as quickly as possible for any conflict within the team. In addition, the ability to analyze and evaluate issues then make appropriate decisions for the resolution is also crucial. (Duening et al. 2014.)

- **Communication skills**: Since the producer is somewhat the facilitator of the team, interacting with team members on a day-to-day basis, the ability to communicate and understand others in order to get the work done is important. This includes knowing how to express opinions in a clear, diplomatic manner, provide productive feedback, and the ability to deal with sensitive matters. Communication skills in meeting in particular are essential, the producer is expected to be the moderator, setting up presentation, controlling the discussion progress, answering and giving questions, etc. (Bosch 2013.)

- **Organization skills**: These are the most important skills that every producer must possess, organizing means creating and maintaining project schedule, assigning tasks, tracking details of the project. In some cases, it is the producer's job to write a budget and negotiate with suppliers. Knowledge of project management principles and computer skills (Basics, Word, PowerPoint, Excel, etc.) are extremely useful tools for the producer in organizing activities. (Scolastici & Nolte 2013; Robledo 2012.)

- **Teamwork skills**: Beside from being a leader, a producer is also a servant of the team, servicing and providing for the needs of the team. The producer must create an environment in which the team can be most productive and creative. As a team, there will always be criticisms, demands, and proposals from members, the producer must constantly be available to listen to and deal with them in an optimistic, unbiased way. In game making, the team is absolutely everything and the final game product reflects the whole team, therefore the ability and desire to work with other people is definitely required from not

only the producer but members of the development team as well. (Bonin 2014.)

Game industry is a rapidly-grow environment, games are more and more complex, take longer to produce, and require many people involved. Thus, even with mentioned backgrounds, game producers must always train to improve their skills and catch up with the industry. While there are training programs available for producers, they tend to be diverse and focus more on technical aspects of game development. The followings are several trainings that producers should have:

- **Project management**: This is the first and foremost trainings that every producer is required. Classes in project management are plenty, it is best to master this degree and become a certified project manager.
- **Awareness of the game industry's situation**: The producer must always have up-to-date information about the latest technology and trends of the industry, for example: new game engine, popular genre, other studio's release plan, etc. Credible website such as Gamasutra.com, Gamecareerguide.com, or Gamesindustry.biz are reliable sources of info, producers can also gather knowledge of the industry through talking with developers, or playing games.
- **People management:** Everyone is unique, thus there is no universal formula on how to deal with each individual. Particularly in game development, where people came from different background, and have different opinions, the producer should learn how to manage this diverse group effectively and know what motivates them. Practice to have experience as well as a strong personality are extremely useful in this case. In addition, various management classes and books also provide valuable information.
- **Public speaking:** Confidence is what makes a good manager, being able to speak fluently in front of public or team members shows the credibility and trustworthy of the producer. Practice makes perfect, the more experience producer has, the more confident he/she gets when speaking at team meetings. (Chandler 2014, 21.)

To sum up, being a producer is being a jack-of-all-trades. Although a producer is not required to expertise in one specific production field, but having a "little knowledge about a lot" goes a long way. It helps the producer further understand the team, what they do, and the difficulties they are against. In the end, shipping a video game is a very hard thing; it does not matter if it is the producer's first title working with a student team or if he/she got a budget of a hundred million dollars. Fundamentally, the producer's job is to see that product shipped, to see that everyone's hard work

reaches an audience and to see that the studio survive to soldier on to a new project. This means the producer has to be emotionally invested in seeing the product shipped but not in the product itself. There always be some small ways the development team can make the game better, producers are the anchor that aligns the wild desperation of the team with the harsh realities of schedule and budget. Being a bad producer is probably the easiest job in the game industry, certainly the easiest to get away with not being fired. But being a good producer is probably the hardest; producers have to love not games, but game development, they have to love helping a team function as a unit. The best producers are genuinely passionate about seeing their team's hard work rewarded and can be equally invested in that goal whether they are working on a dreadful licensed title or the game of their dreams.

4   RESEARCH ON DEMOGRAPHIC OF GAMERS IN HANOI, VIETNAM

4.1   Research's background

The purpose of this research is to help author understand the current trend of video game market in Hanoi, the capital of Vietnam by analysing the demographic of local gamers. The method used was quantitative approach; data was collected from results of online survey and analysed in order to draw conclusion on whether Hanoi would be a potential market for new start-up studios.

The survey consists of nine questions; respondents are required to answer four compulsory ones, the rest are checkboxes, participants can choose more than one option. The survey was compiled using Google Form and sent directly to participant via emails or through social networks in form of link to answering page.

The target group of the research is people at any age who are currently living in Hanoi, Vietnam and interested in playing video games. Participants are allowed to join freely and can give only one response per person. They are expected to be truly honest in answering since their identities are completely anonymous.

4.2   Research's results

There were total 301 responses accumulated over the course of 3 months. Most of which were collected during the first month published. Some of the results were collected with the help of few local internet cafes and gaming centres, where lots of people with different backgrounds gathered.
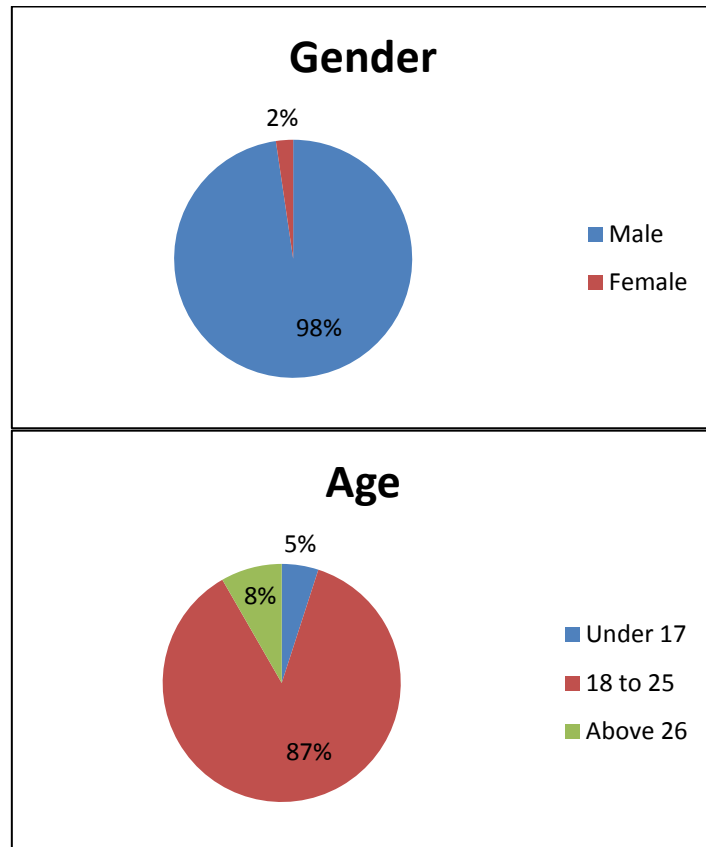
Gender and age groups

Figure 11. Gender and age groups of respondents (N=301)

There were 301 respondents who participated in this survey, 7 of which were female gamers occupied only 2% of total participants, and naturally, 98% left are male gamers. There is clearly a huge diversity between genders in this research, however I believe by no mean this was a result of gender discrimination. It is possible that the survey could not reach female audience, or simply that they were not interested in taking it.

Majority of participants are from 18 to 25 years old (261 accounted for 87%), possibly most of them are college students. Only 15 respondents (5%) are 17 and under, the rest are already above 26 years old. This distribution is as expected considering that college students certainly are more willing and open-minded than high schooler and have much more free time than salary men.
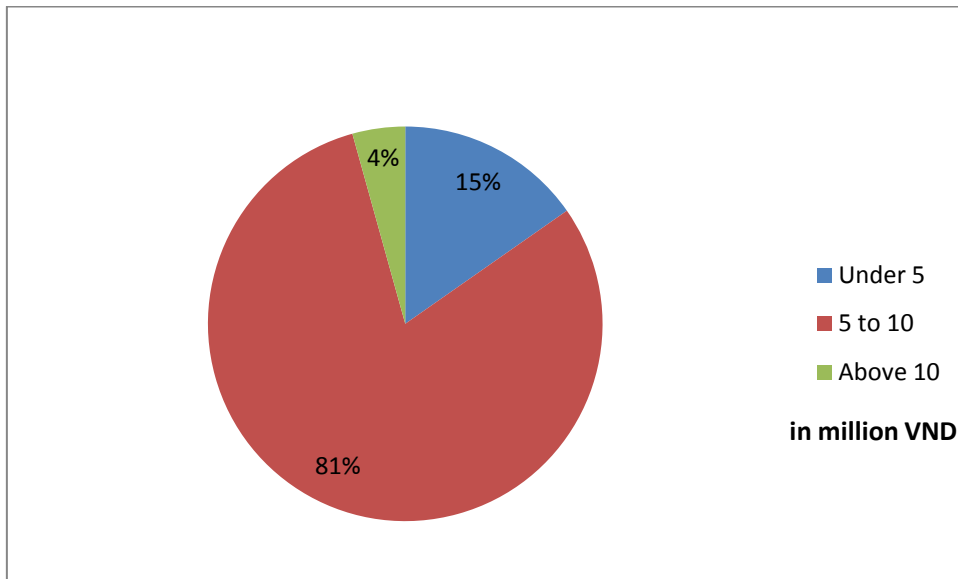
Salary

Figure 12. Income of respondents (N=301)

Surprisingly, 85% of respondents earn over five million VND per month with only 13 respondents (4%) have salary of over ten million VND a month. Considering 87% of participants are college students who usually do not have stable jobs, this is an interesting discovery. Presumably, they could also get financial supports from their families. This figure is extremely important as it can be used to interpret with further statistics.
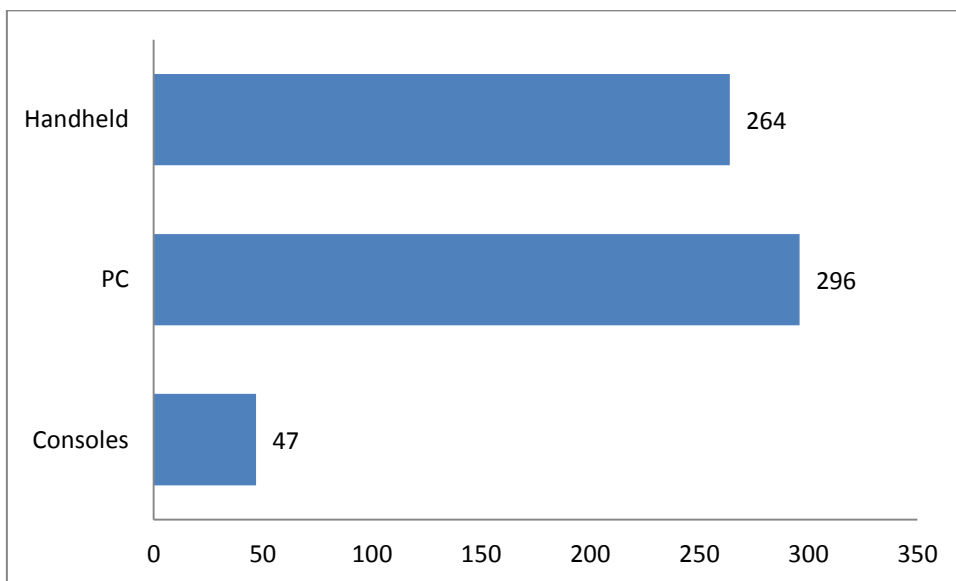
Gaming systems owned

Figure 13. Respondents' gaming systems (N=301)

The console market is really dreadful; only 47 out of 301 participants (16%) own a gaming console while almost every person has both PC and handheld device for gaming (98% and 88% respectively). The reason for the console market's situation might be the availability and price of console games. A console game cost over a million VND, which is one fifth of minimum income of college students as said in previous paragraph; not to mention the cost of the console itself can make average gamers think twice before purchasing. PC platform has always been dominated the market, but with recent popularity of mobile devices like smartphones, tablets, etc. PC games will be facing a very strong competitor.
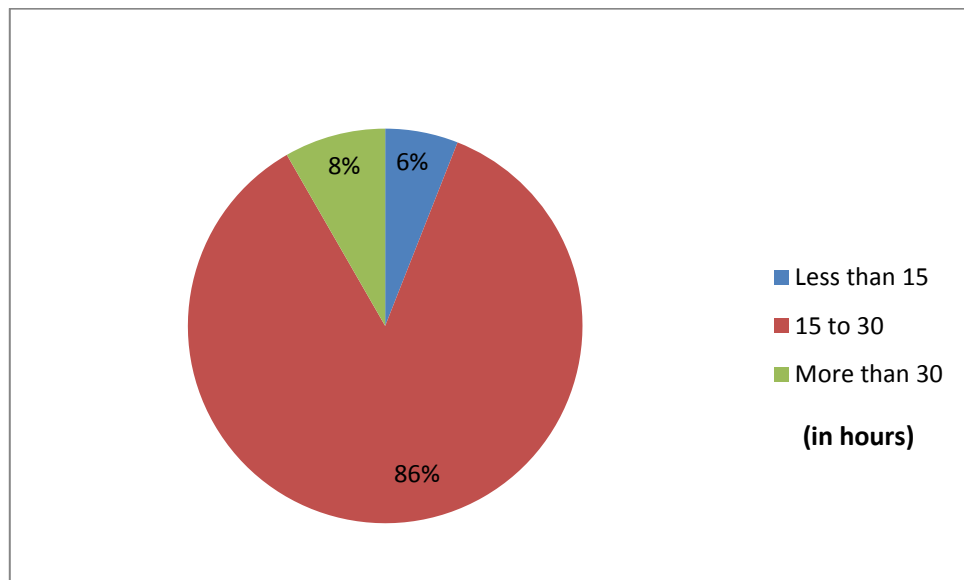
Playing rate

Figure 14. Time respondents spent playing video games per week (N=301)

Figure 14 indicates 86% of respondents spent 15 to 30 hours playing games per week which is average 2 to 5 hours a day. Taken into account that 98% of participants own a PC and 88% own at least one handheld device, we can assume that gamers spent most of the time playing on either platform.
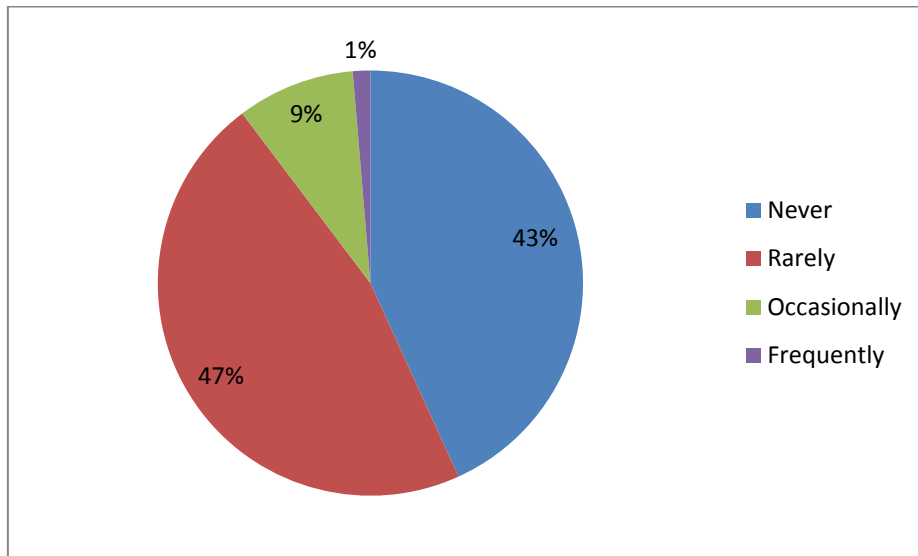
Purchasing rate

Figure 15. Respondents' purchasing rate (N=301)

This segment is the most important aspect of the survey. Depending on the result we can reach a solution for monetizing method of future published video games. According to Figure 15, there are total 57% of gamers willing to spend money on video games with the most common rate is 1 or 2 times a year (47%). This shows how reluctant to pay Vietnamese gamers are. This unhealthy habit is due to the circumstance that these people might not consider video game as a form of legitimate entertainment like movies or music; plus, software piracy in Vietnam is still a persistent problem which affects majority's ways of thinking.
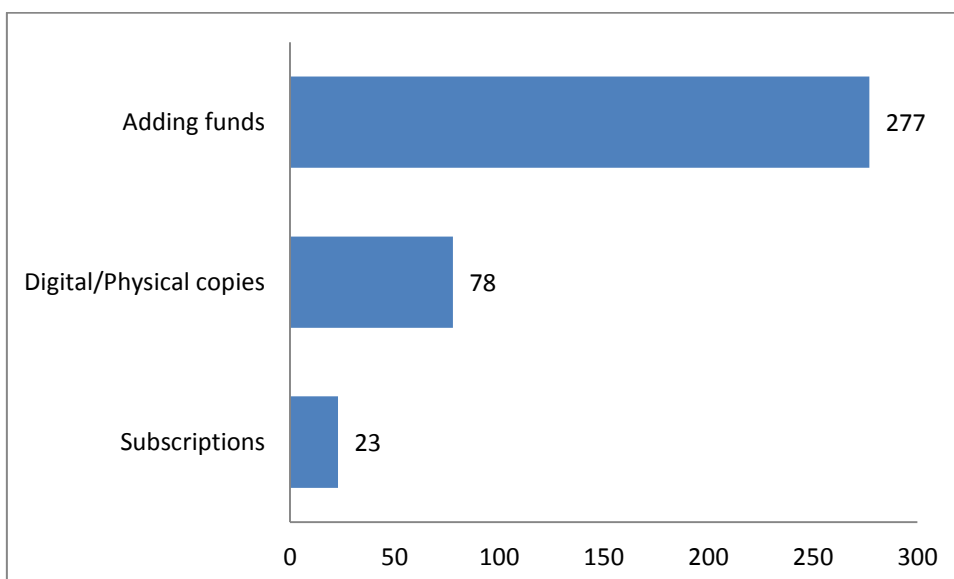
Purchasing purpose

Figure 16. Respondents' purpose of purchasing (N=301)

Figure 16 demonstrates the popularity of three most common monetizing methods in Vietnamese game market. The subscription model (Pay to play – P2P) is still unpopular as ever, very few games have managed to succeed with this method and mostly they are published by large enterprises. The most successful way of monetization in video games in Vietnam is via Cash shops: players add funds to their accounts by purchasing virtual currency with real life money and use it to make transactions in game. Micro transactions also have been proving to be very effective recently, especially in mobile game industry; games like Candy Crush, Clash of Clans…have players spend hundreds of dollar without a second thought. Considering the software piracy problem and the purchase rate of consumers, the Buy to play (B2P) game model which have buyer purchase digital or physical copy of the game only once to access all features is doing not great but not bad either.
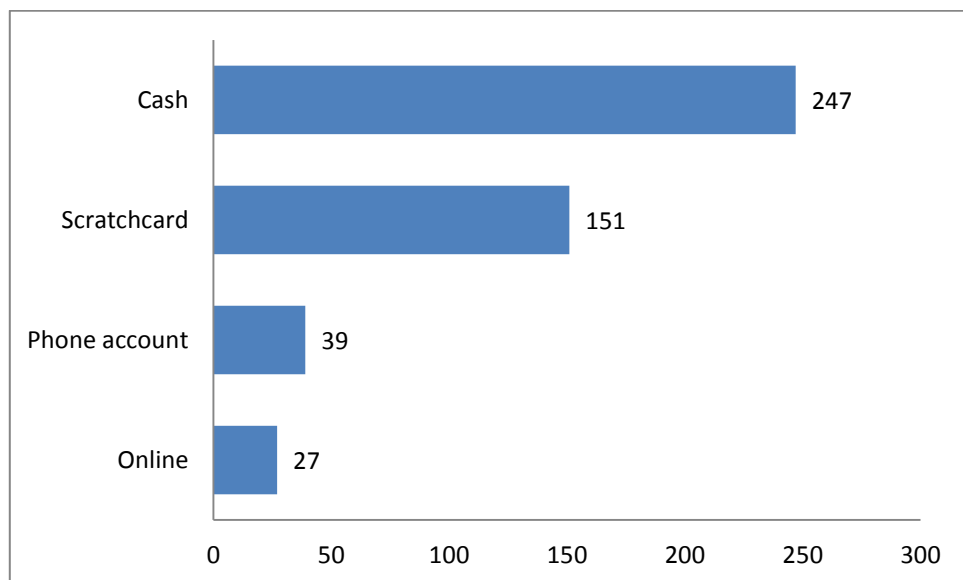
Paying methods

Figure 17. Paying methods respondents used (N=301)

As expected, cash and scratch cards are the usual ways, if not the easiest ways to pay for video games in Vietnam, account for 82% and 50% of total transactions respectively. Online transactions via bank account, credit/debit cards, or e-wallet (Paypal, Steam wallet…) are uncommon (only occupy 9%), since the procedures are still complicated for majority of Vietnamese citizens.
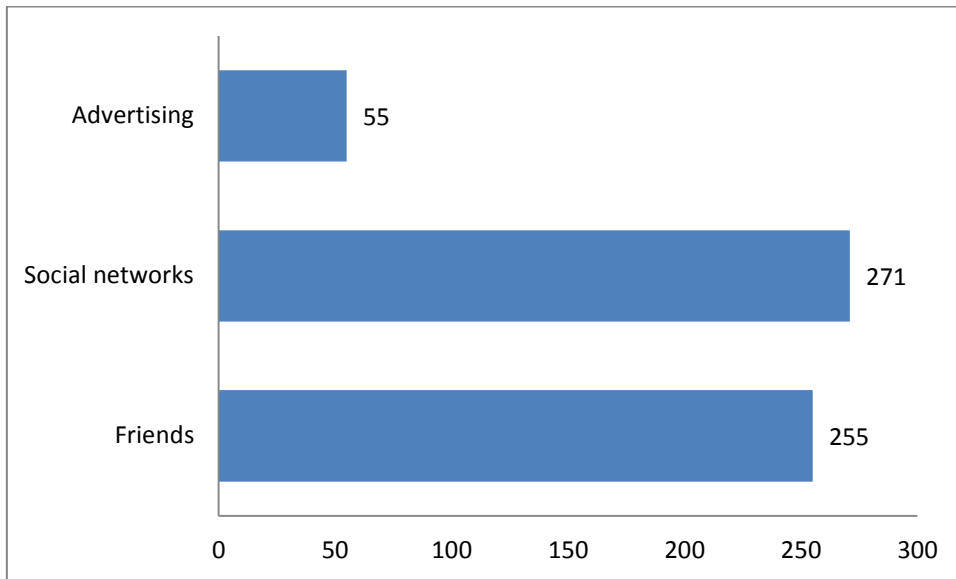
Information sources

Figure 18. Respondents' sources of information (N=301)

Figure 18 illustrates how consumers often get information about new games entered the market. There are only 18% of gamers pay attentions to marketing media like newspaper, television, websites, etc. Community plays an important role in recognition of a game; Vietnamese gamers tend to follow the most recent trend of playing games, mostly they are interested in playing games which their friends are playing (85%), and majority of them use social networks as a tool to discover new games (90%).

4.3 Warping up

The research shows the demographic of small group of gamers in Hanoi, Vietnam. Based on the data collected, researcher can have an overall vision of the game market in Vietnam. Leading the current trend in gaming is majority of male college students, ranging from 18 to 25 years old, most of which have average income per month with minimum number being five million VND. The dominating gaming platforms are PC and handheld device with typical 15 to 30 hours spent for playing every week. The most common and successful monetization in the market is via micro transactions, having players purchase using cash or funding account using scratch cards. The best way to market new games is through social networks and using word of mouth.

5   SUMMARY

This thesis serves as a guideline on how to manage a video game development process as a producer. The study includes basic knowledge of game production process, focusing more on managing the project as a whole, rather than reaching specific technical aspects. The production methodology portrayed is a combination of several methods used by most studios in the game industry. In addition, understanding of game producer's roles and characteristics was also reviewed to give author a "mental map" to apply in future career. The goal was to accomplish the most efficient and inspired production process as possible which could be utilized in most cases.

The idea of the research comes from the fact that Vietnam currently is the largest video game market in South East Asia (SEA) in 2013 with revenue of 237 million USD, standing at 6^{th} position in Asia, following China, Japan and Taiwan. However, 80% of market share belonged to foreign games (from China, Korea) which published by Vietnamese enterprises. Most of them were computer games, with high complexity and already had numerous established customers. Game Emobi, a domestic game development studio, had gambled with their first advanced graphic first-person-shooter game titled "7554" about Vietnamese soldier in history. Yet, after two years published and with budget of one million USD (approximately 23 million VND at time), "7554" only had 5.000 copies sold and brought revenue of 17 million VND (ITP 2014). With such growing but challenging market, it is best to research and be prepared before entering; the purpose of this study is to help author have better understanding of current Vietnamese demographic, to determine the potentials of environment and possibly contribute to the industry in the future.

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APPENDICE

Appendix 1. Questionnaire for gamers in Hanoi, Vietnam (in English).

Online Survey

This survey is used for collecting data from Vietnamese gamers. The results will be used in the final thesis as part of Bachelor degree. Choose only 1 answer for every required question.

*Required

1. Gender *
   o Male
   o Female

2. Age *
   o Under 17
   o 18 to 25
   o Above 26

3. Income (per month) *
   o Under 5.000.000 VND
   o From 5.000.000 VND to 10.000.000 VND
   o More than 10.000.000 VND

4. Gaming systems owned
   ☐ Consoles (Xbox, Playstation, etc.)
   ☐ PC (Laptop, Desktop, etc.)
   ☐ Handheld (Phone, Tablet, etc.)

5. Time spent playing video game per week *
   o Less than 15 hours
   o From 15 to 30 hours
   o More than 30 hours

6. How OFTEN do you spend money on video games? *
   o Never
   o Rarely (1 or 2 times a year)
   o Occasionally (1 or 2 times in few months)
   o Frequently (every month)

7. How do you spend money on video games?

☐ Paying for subscriptions

☐ Buying digital/physical copies

☐ Adding funds

☐ Other:

8. What paying methods do you use?

☐ Online (via Bank, Credit/Debit card, e-wallet)

☐ Phone account (prepaid, postpaid)

☐ Scratch card

☐ Cash

☐ Other:

9. How do you often find out about new games?

☐ Friends' suggestions

☐ Social networks

☐ Advertising (newspaper, TV, websites, etc.)

☐ Other: