University of Hradec Králové

Faculty of Informatics and Management

Mobile Monetization and its Practical Use in the Current Development Environment

Bachelor's Thesis

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Declaration:

I declare I wrote the Bachelor's thesis myself, using only the listed bibliography.

In Hradec Králové, 20.04.2020   Signature

                                                                        Mark Polishchuk

Annotation

Title: Mobile Monetization and its Practical Use in the Current Development Environment.

The aim of this bachelor thesis is to analyze different kinds of monetization and its usage in different games and applications, providing an in-depth analysis on a case study. The theoretical part of the thesis evaluates the current means of mobile monetization, explains conceptual means of monetization based on different mobile games, while evaluating data from several well-known statistical sources. The practical part consists of two integral parts. The first one comprises a case study based on Ubisoft company and their latest mobile game release called "Might and Magic: Era of Chaos". The second one introduces an evaluation of the mobile gaming business future during the COVID-2019 outbreak and beyond.

Development Environment, Game design, Game Engine, Monetization, SWOT Analysis.

Anotace

Nazev: Mobilní monetizace a její praktické využití v současném vývojářském prostředí.

Cílem této bakalářské práce je analyzovat různé druhy monetizace a její využití v různých hrách a aplikacích, a poskytnout tak hloubkovou analýzu diskutované problematiky v případové studii. Teoretická část práce hodnotí současné možnosti mobilní monetizace a vysvětluje koncepční prostředky monetizace založené na různých mobilních hrách. Využita jsou data z několika známých statistických serverů. Praktická část se skládá ze dvou částí. První představuje případovou studii zaměřenou na společnost Ubisoft a její nejnovější verzi mobilní hry s názvem „Might and Magic: Era of Chaos". Druhá část se věnuje budoucnosti byznysu mobilních her v době vypuknutí COVID-2019 a po něm.

Design her, herní engine, monetizace, SWOT analýza, vývojářské prostředí.

CONTENT

1. Introduction

The mobile application industry in general, and mobile gaming environment in particular, is a new and contemporary area of business that has appeared just slightly more than a decade ago. Nonetheless it became a huge and lucrative market and attracted billions of users, millions of developers and numerous investors, business angels, private equity and venture funds. It has created a large number of working places globally. It may become one of the most profitable businesses if the major source of its success is managed to be mastered – a monetization of commercials. The thesis will cover this matter extensively and exemplify that having a proper method of monetization can ensure the future success of one application or another.

According to Mediakix's (2020) report, global mobile gaming/application industry created an immense gross income of $80 billion USD in the year 2019 alone. Furthermore, it is forecasted that it will grow up to $90 billion USD in the next year. According to Green (2019), in year 2019 there was an annual gross income of $49.05 billion USD, which is projected to surpass $54.27 billion USD in the year of 2021. Even though statistics from various companies differ, common assumption is that the market is far from being saturated. Green (2019) also provides a chart that only 1.37 billion people out of the entire world consider themselves as mobile gamers, but some customers do not consider themselves gamers, despite having some mobile games and using them on regular basis. Moreover, Green (2019) predicts the increase among mobile gamers up to 1.48 billion in the current year. It becomes evident that commonly discussed mobile revolution is just at the beginning.

Louis (2013) shared interesting statistical data about monthly income, which mobile operational system has provided. According to Louis (2013) in Forbes Magazine, iOS application developers made, on average, $4,000 USD per month; Android developers with $1,125 USD per month came in second place, and third place was taken by Windows Phone developers with only $625 USD average monthly income.

Researching the article written by Golmack (2017), the author shows that the situation has changed dramatically starting from year 2016. This author analyzed data for years 2016-2017: applications for Windows Phone provided on average around $11,400 USD in monthly income, while iOS applications generated on average of $8,100 USD, and Android $4,900 USD. Shilov (2019) states that Windows decided to stop Windows Phone support, leaving only two big competitors on the market. Despite the smallest average revenue, approximately 75% of all the developers began

to consider Android as the main platform, they were planning to increase their revenues on Android, by continually developing applications for this platform.

In order to increase returns from various platforms and to make revenue generation on different platforms more and more appealing, developers have turned more towards a so-called "hybrid monetization". The hybrid means of monetization (for example, built-in add and in-app purchases) are getting more and more traction among developers in the business world. The majority of researchers assume that built-in advertisement system will be the main pylon of mobile market growth in the years to come. (Fyber, n.d.)

Market growth relates to increasing spending of users in the gaming applications, according to researchers. This fact makes games the most profitable applications compared to other types of revenue generators. (Data from Clement, 2019)

According to Clement (2020), in the year 2019, mobile application markets recorded 204 billion downloads of applications, with the total revenue amount of $461.7 billion USD. Revenue was up roughly by 27.9% and 63.7% compared to previous years of 2018 and 2017, respectively.

The means of monetization are changing rapidly with the growth of the mobile market. Before implementing certain way of monetization, manager should plan ahead which way suits the best. Usually strategies of monetization are different, and there is no uniform business model, which would be suitable for everyone. (ElHady, n.d.)

Nowadays, it is not enough to sell game for the settled price and wait while attracted customers will bring the money to developer's pocket. That is why the developers stimulate users to spend on the in-app products in the moment of active period of consumer. The process happens via paid elements which affect gameplay and stimulate the player to stick to the game and continue playing, repeating the cycle.

1.1 Aim

The aim of the thesis is to evaluate the monetization market within the mobile game development and its tendencies, technologies used to implement some of those tendencies and to show it with a real-world example of actual games and applications.

For achieving these results, the following tasks were fulfilled:

A. Analysis of the models of monetization, identify the best ones for mobile market.

B. Analysis of the means of making or monetizing an application or a mobile game.

C. Evaluation of the obtained data on an example of a mobile game.

1.2 Methodology

This research is based on various sources of information and data, which were thoroughly analyzed in order to come to specific conclusions. Below are some of the most important articles that served as a cornerstone to practical points' analysis contemplated herein.

Research and analysis of monetization and IT blogs and resources provided with plenty of relevant information. The main secondary resources are listed and commented below.

a) In the article written by Golmack (2017) "Current trends and future prospects of the mobile app market" the author evaluates current world trends of mobile market application development. Author brings up a comparison of several applications, using time as a main criterion, also evaluating the core types of monetization in different applications, and how those types are used in the latter.

b) Article by Barol (2019) "Monetization of applications: golden vein for developers" overviews diverse types of mobile applications and their preferred ways of monetization. The author mostly concentrates on freemium model apps, pointing out their advantages and disadvantages, and examples of usages. The article reveals how important some aspects of monetization are, and how vital it is to correctly select a right monetization model for any given application.

c) The article about game engine by Unity (2020b) defines it as a set of needed tools for developers to create games efficiently. In a review of the article by Schuetz (2018) "Comparing Game Engines: Unity vs Unreal vs Corona vs GameMaker", the author evaluates 4 game engines for creation of an application, pointing out pros and cons in every one of them. Based on this analysis, the author concludes that the Unity game engine is one of the most versatile, elaborated and polished to make an application for mobile and other platforms.

d) To make this research more profound, it was important to evaluate certain plugins for implementing in-game purchases' systems. One of the key subjects of such evaluation was the "Unity3D IAP plugin" created by Unity (2019). It is a special plugin which allows developer to plug it easily into the app with minimal required coding. This plugin works well with all the known application stores like "Apple Store" and "Play Market". Steps of using an IAP plugin are described in the specific plugin guide by Unity (2020a). The customers are supported by an example code and description of functions. The guide points out some of the crucial moments of implementing it into the mobile application, for example how to assign project ID, how to turn it on, setup barrier for children protection and how to execute example purchase script.

e) The Marketing schools (n.d.) (an online marketing research and study facility) provides a very clear explanation of what is conversion and conversion marketing in mobile applications, and how

important is to use every bit of information about customer, customer behavior and projected customer actions, which are dedicated to one and the most important goal: how to turn an occasional onetime visitor into a loyal customer.

f) A set of articles that were used in the thesis, describe how to make developed content viral, how to work with it and what it requires in order to succeed (Computer Hope, 2017; Levitas, n.d.).

g) The article by Kim (n.d.) "Word stream CTR" gives an extensive CTR (click through rate) or a "clickability" description, defines how important is it, how to know if certain content was viewed and how many times, did it have any consequences (like extra clicks and follow ups) and how CTR in general affects marketing and advertisement.

h) The article "Monetization – what is it?" by Russian website "Fininru" (n.d.) evaluates different kinds of monetization, provides a brief description of means and segments of monetization, and shows how monetization can be used to gain additional profit.

i) In the article published by "The Manifest" (2018) named "How in app advertising works in app monetization", the author evaluates further what is monetization as a concept, how it can be implemented in a specific application, and its advantages and disadvantages.

j) In the article written by Grasshopper (n.d.) the anonymous author reviewed most used platforms for crowdfunding, including comparison between Kickstarter and IndieGoGo, while outlining certain benefits of using those specific platforms.

For this thesis various webpages of game and application developers were thoroughly researched, some applications were bought and downloaded for further study and analysis. Webpages of the following application developers were used as additional source to gather basic data and access to Apple Store/Google Play pages for further downloads and investigation: "Duolingo", "Might and Magic: Era of Chaos", "Bloons tower defense 6", "Archero", "Bike baron", "Fortnite Mobile", "T-Journal", "Plague INC", "Empire and Puzzles". (Application and games by Duolingo, 2018; Ubisoft, 2019a; Ninja Kiwi, 2018; Habby, 2019; Mountain Sheep, 2011; Epic Games, 2018; "Коммитет", n.d; Small Giant Games. 2013).For final part of the research, an interview was conducted, the subject of the interview was a topic of an overall revenue and download performance of a game by Ubisoft (2019a) - Might and Magic: Era of Chaos. Interview was conducted with a Ubisoft community manager named Evelyn (2020).As a small disclaimer, it is worth noting that in spite of the fact that mobile application industry is extremely lucrative and generates a lot of news and buzz around itself, the pool of different scientific and financial sources and magazines is very scarce and limited, which made creation of this thesis especially challenging.

2. Monetization in the Mobile Application and Corresponding Fields

Monetization is a broad meaning, used in various economic fields. The word "monetization" is the process, which describes gaining revenue in terms of money equivalent. Although term "monetization" can be used with a different meaning, everything depends on the actual usage in the corresponding field (InvestingAnswers, 2019; Fininru, n.d.).

2.1 Monetization and its Kinds in the Applications

Monetization and games are becoming very close related with the addition of in-game purchasing options. They are coming with big variation among the monetization ways, affecting all the age groups, causing some increased interest. Unfortunately for quite a long time, modern applications and games developers were using cynical and predatory means of monetization, utilizing gambling addiction of various age groups of population for their own benefit without accounting for costs of such monetization. Due to that monetization should be regulated differently, by laws, companies and customer utilizing monetization at a full potential. (King, and Delfabbro, 2019; Herrero, 2019)

Monetization is a very complex mechanism that demands proper balance. For example, if one makes it too aggressive, it may result in smaller or no revenues at all, if one makes internal monetization with low barrier of entry, it may break the balance between customers and in-game artificial market. Nonetheless, such schemes are made to encourage players to gain visible advantages, such as paid content, special currencies, VIP and premium packages. Gathering sufficient information with big data (explained below) is mandatory, possessing information allows to target the best group for the game, resulting in higher revenues. Connecting application or game with Facebook, sharing information about the customer, will provide developers with information about gaming and spending habits, presenting offers predetermined by the system to maximize the revenue (King and Delfabbro, 2018; Walker, 2015).

Big data is an every bit of data each particular customer leaves in the system, for it to be analyzed, for further prediction and customiziation of customers experience. The bigger the data the bigger the systém of data evaluation should be applied and customized. (Walker, 2015)

- Monetization of economy – relation of average annual money supply to gross domestic product. (Index of macro economy)

- Monetization of budget deficit (government debt) – a mean of covering government debt with money.
- Monetization of privileges, for example it is a reform which happened in the Russian Federation in years of 2004-2005, to substitute privileges with payments.
- Monetization of projects, businesses, in computer games – means of extracting revenue.

Researching the most common and popular means of monetization.

To gain revenues from already finished mobile application, developers can use couple of different ways. The following paragraphs contain description and analysis of each way of monetization separately. (Golmack, 2017).

A. Direct Sales

If application is not purchased, there are only screenshots, description, and videos possible to look at. They are meant to stimulate the client to buy the application, to showcase they are getting what they are paying for. With this approach it is hard to decide for a customer, which resulted in underwhelming statistics: paid applications are not on the list of the most profitable ones. Specifically, paid applications were losing the fight for customer's attention in most cases, although sometimes they managed to receive proper traction, for example, Minecraft Pocket Edition – the most profitable application in the Google Play. "Minecraft" was released in 2011 as a game in sandbox genre, the cost of download is around $6.99 USD per copy. As of 5.04.2020 it has 3,156,962 reviews and overall rating of 4.4 stars out of 5. (Mojang, 2016)

B. Freemium

Freemium, which is a combination of words: "Free" and "Premium", means that the core functions are available to users free of charge, while enhanced functions are possible to buy in a form of a one-minute purchase or by a subscription to a service. Usually those applications have quite a low percentage of users who are paying continuously, so they mostly rely on increasing the number of downloads.

Many developers prefer to use "Freemium" way of monetization. Free application advertises the idea how user will be satisfied with paid version or buying certain items. Customer downloads a basic version of the game, utilizing a game or application till one meets a certain artificial ceiling: increase of levels required to power up, more time consuming actions or just increase in the in-game prices, when developer offers to speed up the processes or make it even simpler, by cutting some

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restrictions – to buy full access from the in-game shop. In-game purchases work in terms of offering additional bonuses, functions or cosmetics.

Despite controversial critique, how speculative and addictive discussed mechanics are, Freemium model works in the best possible way. One of the most successful examples is "Might and Magic: Era of Chaos" a game developed by (Ubisoft Mobile Games, 2019)

C. Subscription

Subscription is partially similar to the freemium model. The difference is that users pay for full access, not for partial functions or virtual currency. Current model generates constant and predicted revenue for its' developer, supporting high margin of loyalty coming from customers.

A very good example Fig. 1 is an app which hosts online theatre services – Netflix. It offers a free month at first, but to be able to watch after expiration of the free period, customer should choose a subscription plan which comes with certain benefits:

	Basic	Standard	Premium
Monthly price after free month ends on 5/10/20	199 Kč	259 Kč	319 Kč
HD available	✕	✓	✓
Ultra HD available	✕	✕	✓
Screens you can watch on at the same time	1	2	4
Watch on your laptop, TV, phone and tablet	✓	✓	✓
Unlimited movies and TV shows	✓	✓	✓
Cancel anytime	✓	✓	✓
First month free	✓	✓	✓

Fig. 1 Netflix subscription plans. (Netflix Inc, 2007b)

Official Netflix website offers certain subscription plans with according price per month. Researching Netflix Inc. 2007a Netflix has a rating of 4.5 stars and more than 8 million reviews in total among all the countries where it is available.) Other good examples are various dating,

for instance Happn, that allows to use basic functionality, but with a paid subscription it allows to use premium features to find a match or a date (Happn, 2014).

D. In-App Purchases

Monetization via in-app purchases is commonly associated with games, it represents an application with additional cost on every purchase. The model is so versatile, that some of the developers go over the top with it. According to Tech Times during the year of 2016 only 1.9% of customers of mobile games made an in-app purchase and the number is growing. (Keating, 2016)

Mentioned above applications like dating application Happn, and other dating social networks in general, where users can meet other people according to their preferences provide additional functionality that can be purchased. One can buy special form of marking a user one like (a so-called "Superlike"), additional boosts for one's profile, to make it appear more often while other people search. Due to that simple method of monetization, developers receive increased revenues. The most recent successful example is games like Empires & Puzzles which gained so much success with its in-app monetization, that it attracted attention from a major game developer on the market – Zynga, who has acquired a small developer company Small Giant Games for over $700 million USD back in 2018 (Small Giant Games, 2013; Sharma and Baker, 2018).

E. Crowdfunding

Crowdfunding represents a relatively new model of monetization. Developers showcase their idea of an application which they want to develop, on the platforms like Kickstarter, GoFundMe or Indiegogo, and ask to support there. It happens that successful ideas get much more support then they asked for, meanwhile when some average projects are not getting enough. (Grasshopper, n.d.)

Kickstarter startup of a project of "Shadow" by Soik (2014) provides an ideal example. Startup achieved extraordinary success with crowdfunding: developers accumulated $82,577 USD from 3,784 backers. Shadow decided to use crowdfunding to support their sleep and dream detection application, providing additional perks for bigger contributors. It is worth mentioning that there is another recognizable startup project called "Light table" – it is an app that acts like a coding document which shows and helps developer while one codes, reacting to one's ongoing activity. The startup was able to raise $316,720 USD from 7,137 backers. (Granger, 2014)

F. Sponsorship

Sponsorship is relatively new method of monetization as Barol (2019) states. Users of a certain application play role of an advertisement agent, receiving payment for that, while a significant part of every payment goes back to application developers. This method is still quite new and not fully developed, and as any new type of monetization, its marketing strategy should be reviewed and polished before it will be utilized in full capacity.

As an example, the application named "Runkeeper" (n.d.) is using this model. Application by ASICS Digital Inc. (2008). It is an application which utilizes the sponsorship system the best way possible. With more than 45 million people, the application rewards people who use bicycle, run and perform physical activities. After user performs any physical activity subject to a reward, the companies which advertised within Runkeeper application will pay the customers a fixed fee. The model is based on double-sided trust, and it ensures that no unnecessary or annoying advertisement will be shown to its end users.

G. Monetization via Advertisement

This system represents one of the most popular means of monetization, that is why this monetization type will require a closer look at it. The reason being it is so popular is simple: people like to download free applications, and more downloads specific application gets, the more advertisements will be shown. IHS Markit supposes that, approaching year 2020, built-in advertisements will bring around $53.4 billion USD in revenues accumulated in a year. That alone represents almost 64% of all revenues from mobile advertisements. Same as in other sectors, certain amount of developers can maximize their revenues, and take the biggest part of it, from this kind of monetization, when the rest of the developers have a smaller portion of it (Kent, 2016).

Companies generating the biggest revenue from advertising, usually become the main sponsors. That tendency is noticeable with game developers: Rovio, Gameloft, Disney, Playrix. They recruit small independent studious (usually called "indie studios"), which advertise their products in smaller games. (Singular, 2020)

As Computer Hope (2017) article explains, indie game is a game created by a small developer or by a small company of people, without financial support of a large game publisher.

2.2 Ways of Monetization Boosting and its Ways of Execution

Interest to gain more revenues is being pursued by every developer to make product successful, by selling goods or monetizing parts of the gameplay. It can be done in several different ways.

2.2.1 Instruments of Monetization as a Part of Functional Application.

There are a lot of means of monetization boosting, let us take a closer a look on the most utilized ones.

A. Promotions and Discounts

Some of the most classical marketing instruments include promotions and discounts. As an example, discounts directly applied to the game prices, first in-game purchases, timed discounts, bigger discounts for bulk purchases. The main condition in this monetization boosting strategy, is to present the right customer with the discount, either a customer who buys on a common basis, or somebody who didn't make any purchases for a long time.

Fig. 2 represents a screenshot from "Might & Magic: Era of Chaos", a game by Ubisoft Mobile Games (2019). There is an example of a discount for a pack of "Heaven-cast stone" - an in-game valuable resource. There are 2 ways of getting faster progress inside the game – either an in-game currency (gems) earned for game progression or real money, while purchasing with money is cheaper by 20%.

Fig. 2 Screened from the game "Might and Magic: Era of Chaos" (Ubisoft Mobile Games, 2019)

B. Boosters and Power Ups

Boosters and power ups (powering up mechanics) is another example to increase monetization, this type of items helps players to complete levels and hard quests. It is important to let customer understand, those are not mandatory to purchase, but it will ease one's life and act like a small supporting mechanism.

Boosts can also be unlocked through a regular gameplay, for example, as a reward for a finished level. Trial boosts will ignite an interest, allowing a person to feel the benefits. It is important to provide a player with a boost when it is truly needed in order to maintain and keep player's desire to play more and potentially spend more.

In Fig. 3 there is a sample boost tab from game Bloons Tower Defense 6. (Game by Ninja Kiwi, 2018)

Fig. 3 Powers menu in the game of "Bloons Tower Defense 6" (Ninja Kiwi, 2018)

C. Social Activity

This type of monetization boost is not the most popular, however it is one of the most effective means of increasing activity and revenues. It basically creates an internal market allowing different users to apply their in-game social activity by encouraging exchange of in game valuable currencies and power ups between users.

Fig. 4 shows one of the most versatile options, it is to connect player's personal account to the one a player has in the game, receiving small benefits, being able to share one's account info from Facebook to game company and vice versa, enhancing one's advertisement experience.
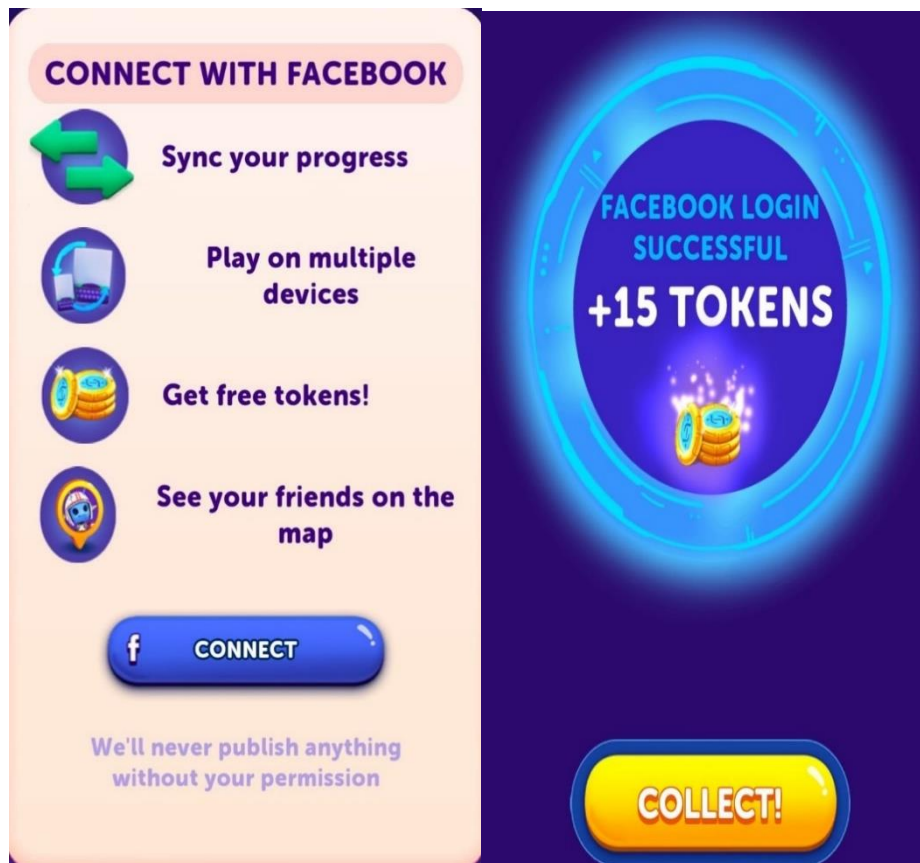
Fig. 4 represents in-game Facebook connection with rewards. Game: CodyCross. (Fanatee, 2017)

D. Timed Events

Fig. 5 shows Timed events one of the best game events, which allow developers to manipulate players and to incentivize them to stick with the game for a longer period, subsequently improving monetization of the application. Timed events, daily quests are the most common attributes of the games, allowing the game to increase virality (spread better among users), and for developers to gain additional revenue. That also includes "login-daily" rewards and "first win of the day" which means player will not only log in to the game, but spend a decent time trying to achieve some progress, which increases player retention (explained below).
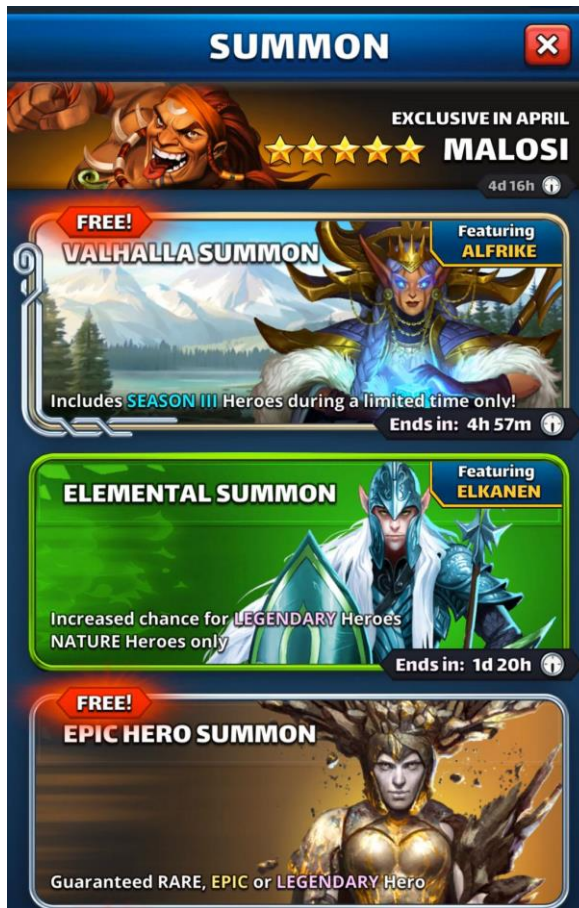
Fig. 5 Timed events. Empire of Puzzels (Small Giant Games, 2013)

Index of player retention – a virtual index which shows possibility of player staying loyal to the game, can be measured by overall evaluation of satisfaction of players, how it will be affected with latest changes, more free and paid content.

Rouse and Haughn (2016) explains that virality is an ability of a content to spread on its own, without any participation of developers' web masters. Viral content is a content which makes people want to spread it to other potential users.

E. Content

Elements of the content are some rare components or values. Possessing those makes game experience better, allowing player to accomplish more and with less efforts. Using those exclusive values, allows game developers to keep the balance between paid users and free users.

Fig. 6 is an example of a shop with rare currency "gems" in the game of Might & Magic: Era of Chaos. (By Ubisoft Mobile Games, 2019)

Fig. 6 In-game gems shop. "Might and Magic: Era of Chaos" (Ubisoft Mobile Games, 2019)

F. Energy

Quantitative representation of players' health, energy, action points and similar categories – those are energetic mechanics which shall o not allow players to lose interest very fast. Every day each player can utilize specific number of energy or action points to progress wihtin the game, and when a player runs out of them, they are replenished over time. Fig. 7 shows how players are able to purchase additional energy or request it from friends to continue playing without interruption.

Fig. 7 Energy purchase menu.Might & Magic: Era of Chaos. (Ubisoft Mobile Games, 2019)

G. Paywall (Paid Access)

One of the roughest ways of monetization, when customers aproach an artificial glass celling, it is mandatory to either perform a complicated action to progress within the game or to pay a certain amount of money to continue, which can be seen at Fig. 8. After a certain progress is achieved, a player has a very limited amount of possible ways to complete any given level, that's why if player

is not purchasing a full version through a paywall algortihm, implementing some other ways like "power up" become mandatory to proceed further.

Fig. 8. Pause menu represents game of "Bike Baron free", free version has less content on all of the levels. Pause menu has link to a full version. (Mountain Sheep, 2011)

H. Cosmetics

Another way of the approved monetization boosts is called "cosmetics". Providing a customer with a way of customizing their account in multiple ways by adding visible perks and additions to account of this player, however usually it doesn't provide any competiteve power increase or any other advantage for a gameplay. Example can be observed in the example Fig. 9, "Fortinite Mobile" a game (Epic Games, 2018a; Epic Games, 2018b).
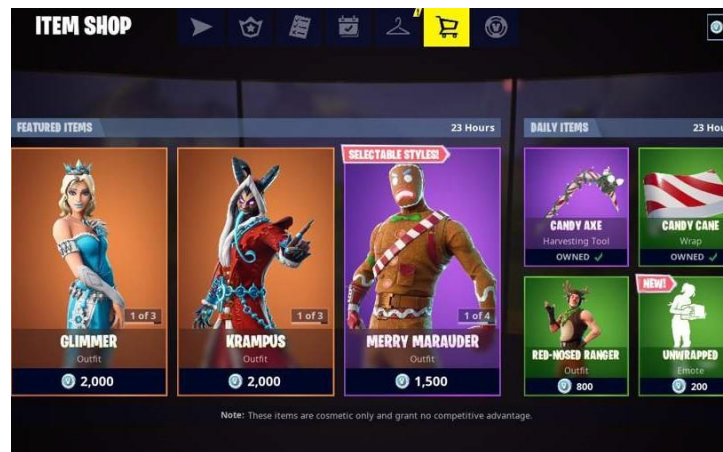

Fig. 9 Cosmetics in-game shop of "Fortnite mobile". Note: shop states that no cosmetics provide any competitve benefits. (Epic Games, 2018a)

I. Advertisement

One of the most popular methods in applications is advertisement system. Advertisement either being shown on a certain place in the application, which provides revenue based on counting of total redirects from an advertisement and total views.

This method works the best in games, entertaiment and news application, messangers. The best suited application are with daily log-ins. iOS-developers tend to not include it in the latest updates of their application, or making it more user friendly.

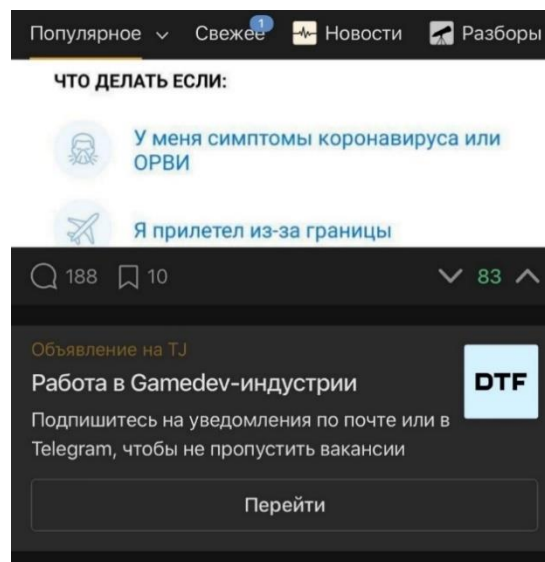Fig. 10 T-Journal application, news feed being interrupted by advertisement. From a company "Комитет".

Fig. 10 Example of Russian application for news service, sells advertisement space.
("Коммитет", n.d.).

J. Push Notifications – The Way of Players Retention

Kim (n.d.) defines that push notifications represent a way of "passive monetization" and retention boost which has a high value of conversion and click through rate (CTR/Clickability) in Internet marketing. CTR is a metric that measures the number of clicks advertisers receive on their ads per number of impressions. Monetizing push notifications provides developers and publishers with a mostly untapped opportunity to engage audiences, satisfy advertisers and create a new revenue stream. By using highly personalized, custom-curated native ads to monetize push notifications, developers and publishers of different applications that create such push notifications gain a high-visibility channel that monetizes every single view, reaching virtually 100% of people who

downloaded an application or made a subscribtion. Unlike web ads, which are only seen by website visitors, every push subscriber sees push ads for guaranteed saturation. Push notifications command users' attention in most cases helping advertisement network to generate over $5 RPM with 1.4% CTR, compared to just 0.05% CTR for display. (Chemel, 2018).

Conversion marketing is a special tactic which makes customer perform specific steps and turn one from visitor through another app to a customer of developer's own product. (Marketing Schools, n.d.; Chemko, 2016).

Fig. 11 represents one of the push notification possibilities from game on iOS platform, Archero by (Habby, 2019)
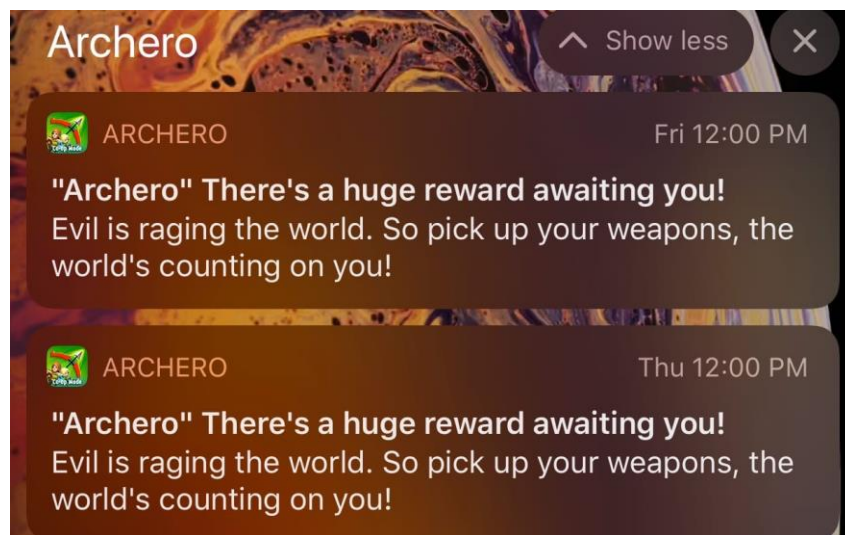
Fig. 11 Push notification left in the notification tray, game "Archero", (Habby, 2019)

K. Rewarding Video

Approved video clips will be shown inside the application, based on the model of Cost per mille (CPM, explained below). Usually server checks if user is using WI-FI network, for them to have the best impression and play a video clip fin its entirety. Example of such rewarding video offer can be observed in the Fig. 12.

Kenton (n.d.) defines CPM as a price per 1,000 entries, for example if application developer decides that the price for any given advertisement in their app shall be $5.00 USD CPM, advertiser will have to pay $5.00 USD for every 1,000 impressions of their advertisement.
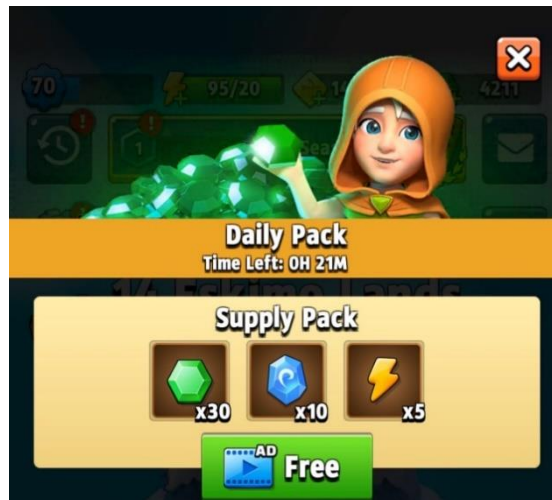
Fig. 12 Represents video advertisement offer, which will present a player with rare valueble in game currency and some energy. Game Archero developed by (Habby, 2019)

2.2.2 Summary of monetization

It is possible to conclude, that huge mobile market growth for past years will keep on going in future as well. Despite high rates of competition in the mobile industry, developers starting to use more and more improved and sophisticated ways of monetization. One of the diffrences in modern approach compared to early approaches is that developers began to take into account interests of common users in order to attract more customers.

Simultaneously the newest added ways of monetization (push notifications, sponsorship and crowdfunding) proved themselfes worthy and right now are gaining more and more popularity. Developers and publishers learned to use those models accordingly. Hybrid type of models of monetization, video advertisement and in-app purchases, are growing in the popularity as well. Majority of the researchers predict that, built-in advertisment shall become a main factor of market growth in the upcoming years.

2.2.3 Analysis of Decisions in Popular Mobile Games

Monetization of application is the best way to make profit out of an application, but because the models are quite different, some of the biggest companies in the field and their respective methods and preferred decisions in their games will be introduced.

A. Game "Might & Magic: Era of Chaos

Universe of Might & Magic is a very old and popular one, established decades ago in 1980s and consists of several lore parts and worlds, war conflicts, different nations and picturesque heroes. Of course, the whole potential is being utilized in the game space. First games were released on the PC in 1986. The license was transferred to different companies, ending up in possession of Ubisoft. They produced a couple of games in this universe, including Might & Magic titles for both PC and Mobile, with the latest one being M&M "Era of Chaos".

Name: Might & Magic: Era of Chaos
Developer: Ubisoft, Playcrab, Ourpalm.
Purpose: Entertainment.
Age targeted group: from 25-34 years.
Platforms: iOS and Android.
Used ways of monetization:
1. Freemium.
2. In-App Purchases.
Number of downloads 90,000 worldwide + 1,100,000 from China region alone. These statistical data were provided by a Ubisoft manager and are relevant for March 2020. (Evelyn, 2020; Sensortower, 2020a)
In-App purchases were implemented using certain in-game mechanics:
1. To progress a player shall spend energy, to replenish it a player needs to wait a period of time for each energy point to recover gradually, or to use a premium currency, which a player either earned throughout one's gameplay or has bought using an in-game shop.
2. Player can purchase certain units which are only accessible with real money payment, in return those units will ease content's completion activities.
3. Those types of units and in-game currency are usually on sale, which forces players to spend more during certain limited periods.
4. The more one buys, the better offers one gets. After reaching a certain point, players, who have attained VIP status inside the game, are entitled to rarest content offered only to them by an in-game shop.

B. Game "Plague Inc."

This game has a gameplay dedicated to infesting humanity, causing pandemic situation in order to eradicate all humanity from the Earth. It was released in 2012 and was accepted very positively. It has received a huge raise in popularity after recent COVID-2019 outbreak, however it was deleted in China's mobile stores (NdemicCreations, 2012).

Name: Plague Inc.
Developer: Ndemic Creations
Purpose: Entertainment
Age targeted group: people from 15+
Platforms: iOS, Android, Windows phone. Special version for PC and consoles
Plague Inc. Evolved: PC, Mac, Linux, PS4, Xbox One.
Used ways of monetization:
1. Direct purchase from platform shop.
2. In-game purchases.
Number of downloads increased drastically after recent pandemic outbreak, leading to additional 200,000 downloads for recent months. (Data from SensorTower, 2020b).
The game provides various scenario packs of different infections, for example viral, bacterial, fake news, anti-vaxxer ideology and other contagious matters (either physically or mentally). Once a user finishes a basic scenario, one is offered to buy these packs to replicate potential outbreaks of other matters.

C. Application "Duolingo"

Application by Duolingo (2018) is a simple and free application to study foreign language in a gaming form. With the help of the application a customer can learn basics from topics like housing, family, food and building simple sentences. The service provides tasks to practice pronunciation, listening, but of course the focus is on grammar and vocabulary.

Application name "Duolingo – Language Lessons"
Developer: Duolingo
Age targeted group: people from 15 up to 35.
Platform: iOS, Android, Windows Phone.
Used ways of monetization:
1. Freemium.
2. Subscription.
Number of downloads has already exceeded 100,000,000.
In-app purchases are offered in the following way: a player completes a specific number of levels, finishing a daily portion of them, and after every lesson an advertisement will be displayed. For a successful completion a player will be rewarded with specific in-game currency, which this player can spend to purchase additional bonuses. To complete all exercises player must have a connection to Internet, although if players purchased a subscription, the customers are able to play offline, have an unlimited possibility to err and there will be no advertisement shown in the end of each lesson.

D. Conclusion

As observed, most of the developers utilize several monetization models in their applications, and in most cases have various types of hybrid monetization as a combination of particular monetization boost models. In modern mobile market applications and games are the best way to generate revenues, providing a stream of income from different sources.

2.3 Development Tendency of Mobile Application Monetization

According to statistical research by O'Dea (2020b), there are approximately 3.5 billion of smartphone users, and this number is subject to grow up to 3.8 billion in the next year, as per author's estimation. At the same time Mediakix (2020), states that there are more than 2.2 billion mobile gamers out of mentioned 3.5 billion users. These numbers will be only growing which will result in increased revenues, from $80 billion USD in year 2019 up to $106.2 billion USD (estimated) in the year of 2021. An article by Ou (2018) states, the reasoning behind such estimations is as follows: advertisement system grows rapidly; developers came up with a new direction of the in game video advertisement, one can interact with the advertisement, experiencing part of the gameplay, which is not accurate sometimes, but it gives a player brief understanding of what to expect from a game or an application.

Users will get used to in-app advertisement. Cultural consumption rate of mobile application grows. Developing and promotion requires a solid amount of spending – which is understandable by any contemporary user. If developer does not charge users for application/subscription/in-app purchases, the only possibility to accumulate revenues, left for the application developer will be to sell in-application spaces for advertisement. The tendency is that more and more users are beginning to accept in game advertisement as a mean to support developers, and experience less and less negativity towards this way of monetization. It is worth to note that current means of monetization through advertisement among market leaders are less irritating to users and are not forced on application users to the most possible extent. Today properly organized in game advertisement that does not prevent players from getting good experience of application utilization, serves as a great possibility for developers to accumulate additional revenue streams while helping to support

the existence of an application, which subsequently incentivizes developers to continue application development and improve it.

Basic economy behind "rewarding video" system. In latest years modern players have experienced a so-called "rewarding video", and the core mechanics behind it are very simple: player watches a small video advertisement, and as a compensation for spent time, the player receives an in-game currency, bonuses, perks or some additional premium content. As Described by Ironsrc (n.d.) states, stable growth of application users' numbers becomes mutually beneficial for all parties, because it rewards users and provides greater effectiveness of monetization compared to other methods, and allows publishers and developers to rely upon this format to better predict and calculate income and profit from an application.

Monetization of the games through in-game purchases. Brightman (2019) mentions, that despite million dollars profitability of "Fortnite mobile" game, which doesn't have any other means of monetization outside of in-game purchase, in near future it is hardly believed that any of the existing battle royal games will follow the success of "Epic Games". Considering that majority of the users (90%+) will never pay a dime in the game, relying on the remaining portion of players is a big risk, that is why the best and most reliable way to regain all the expenses spent on the development and to gain some profit, is to simultaneously test several means of monetization and their combinations.

Increasing number of solvent customers (LTV – lifetime value). As it was mentioned above majority of consumers will not pay for anything in the application, that's why priority is to keep loyal customers and to attract potential favorable long-term clients. Keeping loyal customers is possible with reasonable reaction to critique, continuous development and game supporting activities, and utilization of various bonus systems to loyal customers. However, to attract new customers, which shall become loyal to the game even beforehand, company should use artificial intelligence systems and Big Data analysis, which will allow to separate customers for advertisement process and identify those who are of potential interest for the application developer to target.

Big Data as explained by Walker (2015), is data streams that our daily devices produce as a digital exhaust that is easy to ignore at times. Every transaction in a store, every Google search, and nearly every action on a smart phone produces as small piece of data and much of it is not needed for the use of any given individual, but rather for various companies with business models centered around understanding behavioral patterns and decision making among different groups of smartphone users. These data streams in the new and emerging data market are very important source of analytical

information that helps to customize solutions, services and goods for all types of companies (not only developers or gaming companies) that are dealing with their own customer base.

Competition for customers. Games will remain as the most profitable segment of entertainment, in which they occupy a major part of the market. Oversupply of various gaming application with limited demand as number of users is limited as well, creates a fierce competition between game designers and application developers. Publishers will begin to "go after" customers who use other applications and will actively target their advertisement space and other mechanics of promotion directly towards the players, who are using competing games.

Competition grows every day, barriers of entry become higher and higher and in order to releasing a mobile game in year 2020, one shall have a very strategical view on one's monetization, starting from early steps of development. In addition, modern developers must pay attention to current tendencies of the market, implement new ways and ideas, constantly innovate and update their products and try to outsmart competitors to cover expenses and gain adequate profit from their product.

3. Development and Monetization Tools

Developing a game requires a lot of tools and resources. Before the actual process can be started, a prior marketing research should be conducted to understand developers' targeted market, to select a proper game genre and to choose a revenue structure that this game should generate. It is mandatory to research current market condition, existing competitors, barriers of entry and potential customers, to achieve the best results.

3.1 Description of Targeted Audience

According to Mediakix (2020) research, almost any successful game is skill and age friendly (every age group, Fig. 13), which means that playing them should not require one to have any professional knowledge or being certain age to play.
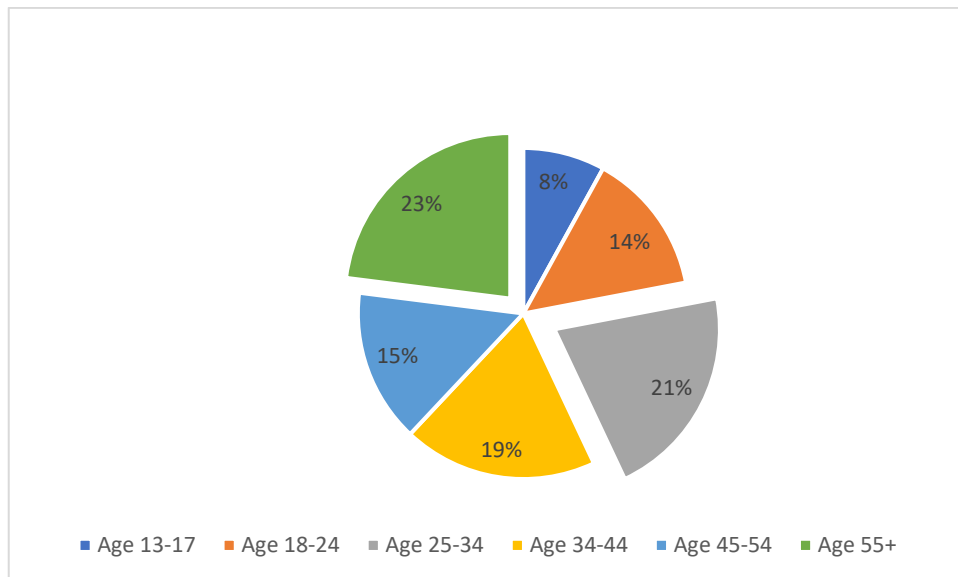

Fig. 13 Age distribution among customers' base who use mobile devices. (Mediakix, 2020).

As part of these tailoring measures, developers might chose to use platformer as a main type. Platformer – is a genre of a game, in which a main gameplay mechanics is centered around jumping from one platform to another, climbing ladders, collecting items which are usually required for level completion of further unlocks and.

Various games in such a genre will allow developers to execute monetization in a very wide specter. Such diversity of monetization options shall be stimulating for younger audience to compete and collect rewards.

One important thing is that unlike other types of the apps, mobile games are very popular across all the age groups of customers.

Using games as a platform for monetization was chosen based on two major factors:

- o Gaming customers' share is the biggest and covers all the age groups.
- o Games provide the best experience to experiment with monetization.

Studying methods of monetization will help app developers and beginner managers to understand core methods of gaining profits.

3.2 SWOT Analysis

As a first step of planning, SWOT-analysis can be prepared. It is a method of first step evaluation of current situation based on 4 factors.

S – Strengths

W – Weaknesses
O – Opportunities
T – Threats

Strengths and weaknesses represent the developer's internal environment, something what one has at this certain period. Opportunities and threats are factors from outside, that may happen or not, and depends on managers decisions, whether he or she will use the given opportunity and consider threats.

In business, strengths points are being evaluated by certain criteria:

- Uniqueness of application.
- Management and HR in general. Competence and experience of the staff.
- Existence of clear system. Business processes and knowledge of staff.
- Finances and access to funds.
- Organized sales marketing. Very important factor of success, lack of sales marketing – a significant barrier.
- Thought-through marketing policy.
- Possessing financial reserves for product developing processes.

Opportunities and threats in the business are usually evaluated according to principals outlined below:

- Market trends. Increase or decrease in demand.

- Economic condition in the country. During the period of growth business will accompany economics, and vice versa.
- Competition and barriers for entry. Lack of competition does not guarantee it will not change tomorrow. Once big entrant comes to a market space it can completely alter existing market environment.
- Change of infrastructure. Changes in infrastructure can provoke higher risk exposure either to big profits or significant loses.
- Law and political tendencies. Business can be controlled or affected by governmental decision.
- Technological breakthrough. Progress destroys old world manufacturing, creating new ones.
- Major events, including so-called "black swans". It is more than evident that such events play a huge role in various business spheres, including mobile application development, which is seen in constant market shifting during COVID-19 pandemic outbreak.

Fig. 14 – SWOT analysis.

	Positive factors	Negative factors
Outer environment	Gaining profit. Promoting developer through application.	Continuous polishing of the app. Cost of development kit purchases.
Inner environment	According to huge growth of the mobile gaming market, now it's the best time to enter. Possibility of adding new functions.	Expenses on advertisements in other application. Abundance of competitors

3.3 Description of Functional Model

Development of an application or a game is a very difficult, sophisticated, time consuming, and technological process. First, comes the idea and brainstorming process, one should define point what is considered a game, and create a list of mandatory tasks. Such a list should be thoroughly thought through and drafted, so that all the important steps are implemented one by one on a timely basis without being missed. Otherwise if one misses a small but significant step, it may affect success of one's game. Monetization of the game is the core of such process and it should be a cornerstone of developer's success.

Second step of the development process is designing and prototyping a game. This step allows developers to develop and execute core functionalities and interface. It is important to understand that mobile games are utilized on various mobile platforms, that is why one should not overcomplicate interface with abundance of buttons, while gameplay should feel intuitive and remain as simple as possible at least at the beginning.

Third crucial step is to design of in-game characters and surrounding world to make it livable and interesting to explore.

Fourth major step is to choose proper monetization types and properly implement them into the game by connecting monetization with gameplay and in game mechanics.

The last steps should include, amid others, constant development and improvement, bug and mistake crashing when necessary and continuous update and support of the product.

3.4 Justification of Software Selection

To execute a proper mobile game, it is necessary to choose a mobile operational system first: These are some of the existing systems:

- Android OS.
- KaiOS
- iPhone OS.

Previously to access information, the user had to have the access to PC with constant internet connection. Nowadays, it is enough to acquire a smartphone, and most people tend to choose smartphones that operate under Android OS. Currently, Android OS smartphones occupy the largest share of the market. (Chau and Reith, 2020)
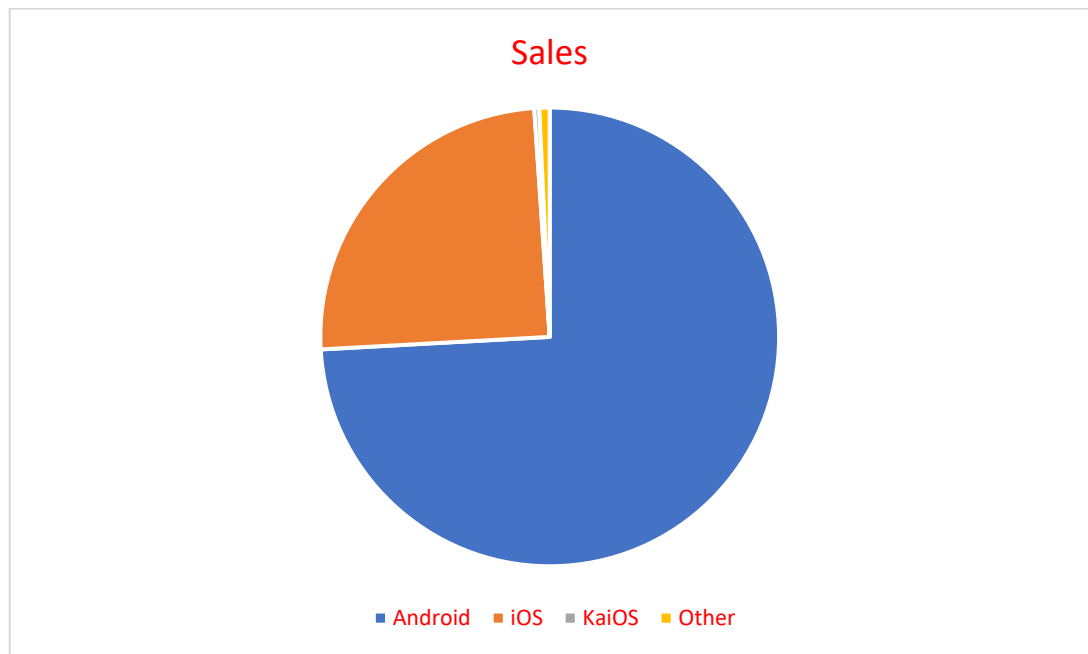
Fig. 15 Sales distribution according to platforms. Data by (O'Dea, 2020a)

Protalinski (2019) mentions that Android which belongs to Google, became the first platform to surpass milestone of 2.5 billion active users monthly. At the same time Popper (2017) states that, other seven Google products were able to separately host 1 billion active users monthly: Chrome browser, Google Play, Gmail, Google maps, Google search, YouTube.

Android operational system is one of the most popular platforms for mobile phones. Android is based on Linux core and its flexible settings very smoothly integrate with handy developmental tools, which makes it an ideal platform for new application creation. There are free and paid Android tool kits that any person can download or acquire, respectively. Android market serves as the main source of such tool kits for android-based devices. This market has an enormous assortment of more than 300,000 programs.

The key tasks, based on my experience and knowledge, which should be fulfilled first in case a developer is developing an android-smartphone application:

- Instant notifications about any important news and updates.
- Providing customers with additional benefits while using developed application.
- Creation of client acquisition strategy to increasing user base in the future.
- Increasing loyalty and brand recognition via promo advertisements in the competitors' application and advertisement space.

- Ensure that selling products/services via in-app purchases will bring profit to a developer.

3.4.1 Justification of Mobile Application Developer Kit

There are a lot of different developer kits and engines to make a mobile application, with the following three as most popular according to Schuetz 2018.

- Corona SDK
- Unreal Engine
- Unity

A. Corona SDK

Corona SDK represents a cross-platform engine for game development on iOS and Android OS. Application programming interface (API) allows to make games and will allow one to implement sophisticated functionalities using API on the Lua base. Besides that, ones can monetize Corona SDK with the help of Corona Ads addition. Development with the Corona engine is quite easy thank to testing in real time.

Corona includes various design features, including Corona Editor, Sublime Text plugin and many more. Coronalabs (2017) developed composer graphical user interface (GUI), accessible on OS X. This provides developers with graphical environment, where one can create game levels, interact with each other and add other plugins to enhance functionality and experience by using Corona's physics engine.(By Schuetz, 2018).

B. Unreal Engine

Unreal Engine 4 (UE4) allows even a small group of developers to create projects with the highest quality, with strong instruments, including visual scripting Blueprint, with open source code and with constantly growing community.

There is a free version of the UE4, however in order to upgrade to a professional version (Pro-version) one will need to pay a very high price.

Unreal engine uses C++ and allows to develop games both for Android and iOS. The free engine version contains a powerful editor, that incorporate partial elements of professional editors. Mastering UE4 will provide a great benefit and support the development process, primarily because some editors can replace even entire developmental tools.

Among mentioned advantages, this engine contains several others, for example, outstanding visualizations, an abundance of different rendering options (lighting, shaders) through which can find some of the most modern shaders, which accompany the engine. Overall, Unreal Engine offers the best mechanism of rendering on the market with a simple pathway to create visually outstanding scenarios. Engine evaluation by (Schuetz, 2018; N-iX, 2018).

C. Unity

Unity is considered the most popular gaming engine in the developer society right now. Free version can be used to create 2D and 3D games. It covers 24 platforms: mobile devices, virtual reality (VR), desktop, consoles, web-platforms and many others. (Schuetz, 2018)

Engine supports 3 programming languages: C#, JavaScript (modified), and Boo (Python dialect). Unity has very simple Drag&Drop interface, which can be adjusted quite easily. It consists of different windows and tabs, which make it easy to debug the game in the editor. Unity project can be separated into the stages (levels) – standalone files, containing whole gaming worlds with collection of objects, settings, and scripts. (Schuetz, 2018; N-iX, 2018).

	Corona SDK	Unreal Engine	Unity
Supported Language	Lua	C++, modules	C#, JavaScript (modified), Boo (Python dialect)
Platforms	Cross-platform iOS and Android	iOS and Android	Mobile devices, VR, desktop, consoles, web-platforms
Free version	Yes	Yes	Yes
Interface rating	3/5	4/5	4/5

Fig. 16 Comparison of engines. (Schuetz, 2018; N-iX, 2018)

3.4.2 Choosing Libraries and Plugins for Development

Several plugins exist for monetization of a mobile application, evaluation of some of these plugins will provide a better understanding of the best ones to use.

A. Unity IAP

Desu0x (2017) states that until recently in Unity 4 adding in-app purchases (IAP) was quite problematic. It was possible to implement it in two ways: either a) to use any kind of IAP plugin;

or b) to program one's own mechanism of in-app purchase for every platform separately. In first case there were several such plugins, for example: Soomla OpenIAB, Prime and some more. Some of those plugins are not free of charge and the prices for them may be quite high: up to $70 USD, while the others were free of charge, while not covering development for iOS platform, like OpenIAB.

Adding in-app purchases algorithm, with the help of newly added Unity 5 Unity IAP, made it significantly easier. This plugin is free, it has a lot of instructions, guides, examples, also it is being supported by leading platforms:

1. Amazon apps.

2. Google Play.

3. iOS App Store.

4. Mac App Store.

5. Samsung GALAXY Apps.

6. Tizen Store.

7. Windows Store.

All these advantages and platforms make this plugin very popular among inexperienced and intermediate developers.

B. In-App

A plugin called "In-App" developed by PlatoEvolved (2014) for different engine adds purchases and in game store mechanics inside any game in merely minutes.

Everythingdeveloper needs to sell, should be coded, and if necessary, can be added, deleted and amended at any time. As an example, the plugin is being supplied with a testing scene, which includes simple and working prototype of a future shop.   The cost of this plugin is only $20 USD, which is lower compared to other analogous plugins.

There is a strong community base of developers and computer programmers who use Unity engine. Based on shared experience and extensive feedback, a guide is available on how to properly code using this engine, which helps understanding how implementation and coding parts work and supports unexperienced developers. Video guide how to setup the plugin by PlatoEvolved (2012).

C. Plugin for In-App Purchases for Android Unity

A plugin named "Android In-App Purchase Plugin" was developed by SkyVu (2011) Pictures, and it adds a possibility to purchase in-game with the help of Android-billing via Unity.

This plugin allows developers to set up a number of user interface elements, while receiving customer's identification number for remote web-server access. However, this plugin is more expensive and costs around $45 USD.

D. In-App Billing

A plugin named "In-App Billing" created by Prime31 (2018), allows to create not only classical build-in-app purchases, but also to purchase downloadable content, setup characteristics and anything what developer would choose to monetize. Plugin "In-App Billing" allows to purchase products with only a couple rows of code using standard billing Google Play method. Fig. 17 represents comparison of all the discussed plugins.

One of the benefits of this particular plugin is that it can be used within Unity environment setting, meaning that in order to use a plugin, it is not necessary to leave Unity environment, but this convenience comes with a high price tag – the plugin costs around $65 USD. There is a profound free of charge video guide that is available for anyone to watch and study how the plugin operates and how its features can be incorporated in developers' product. Video guide by Delaroy Studios (2017).

Plugins/Criteria	Unity IAP	In-App	Android In-App Purchase Plugin	Android In-App Billing Plugin
Price	Free	$20	$45	$65
Size	1.9 Mb	405 Kb	404.1 Kb	224.1 Kb
User review	4/5	4/5	2/5	4/5
Documentation	Yes	Yes	Yes	Yes

Fig. 17 – Plugin comparison and evaluation. (Desu0x, 2017; Prime31, 2018; SkyVu, 2011; PlatoEvolved, 2014.).

Brief Installation Guide for Unity IAP

A menu of available services with a turn off function that can improve developer experience. Some of the available functions can be enabled or disabled, subject to various needs of the developers, while providing functionality to import necessary files. Setup steps in Fig. 18; Fig. 19.
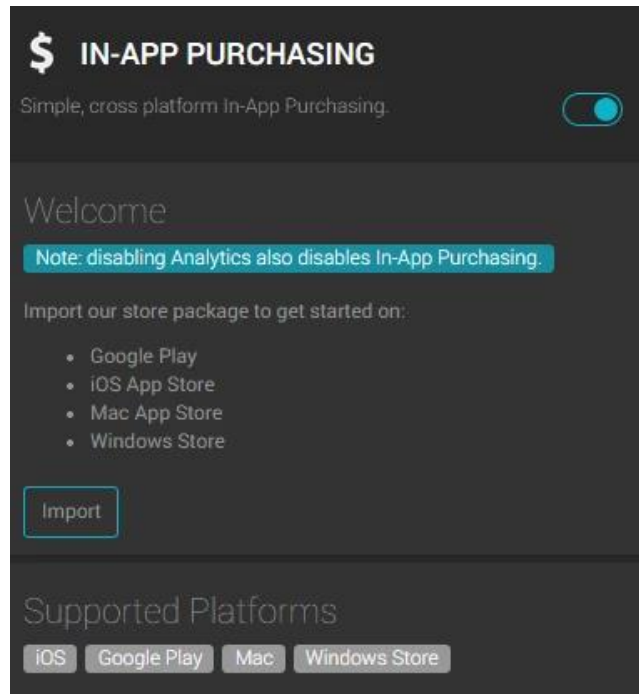
[Fig. 18] Plugin setup and import menu. (Unity, 2020a).

After a sucessful process of import, the plugin is ready to be used.
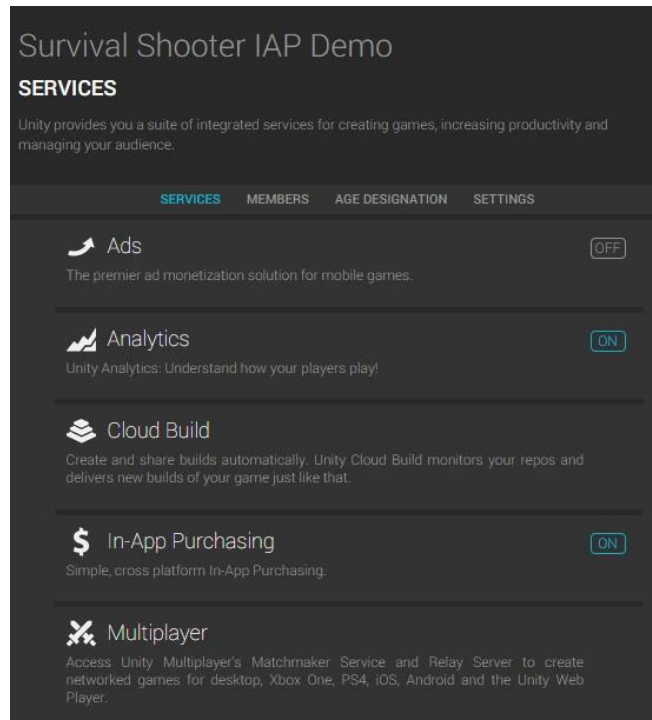
[Fig. 19] Welcome menu after successful installation. (Unity, 2020a).

Conclusion

All in all, analyzing these engines, one can conclude, that they share a lot of similar traits while the major difference is that different engines use different programming language.

As the most versatile game programming engine, it is easy to conclude that the Unity Engine has more functionality, higher rating, many ways to implement monetization, large number of guides and documentation, many built-ins and added plugins, both free and paid. Moreover, it provides basic playground and sandbox for developers to perfect development skills. Its advantages are summarized below:

- Understandable, intuitive and very handy interface.
- Familiar languages of programming.
- Free version that allows the beginners to learn and advanced developers or studios to polish their skills and knowledge.
- Free and built-in possibilities to monetize applications.

4. Case Study

The case study provides deeper research on the topic. In the thesis, the research is based upon the mobile game "Might and Magic: Era of Chaos" and its developer the Ubisoft company.

4.1 Ubisoft Company

Ubisoft is one of the world biggest game developers and publishers. It owns a lot of big game franchises, such as Assassin's Creed, Tom Clancy's, Far Cry, Might and Magic, Prince of Persia series and many others.

Founded in France by five Guillemot brothers in 1986, with their headquarters in Renn, Brittany, the company since then grew to become a market leader in the game development. The active growth came in the late 90s of 20th century. Between years 1996-2000 they established a lot of development studios across the globe, including Shanghai (China), Annecy (France), Montreal (Canada), Casablanca (Morocco), Barcelona (Spain), and Milan (Italy). Currently, Ubisoft manages 26 active studios, across 18 countries, with more than 13,740 employees. (Giantbomb, n.d.)

Section down below contains data which were gathered from Ubisoft annual reports from years 2017-2019. (Ubisoft, 2017; Ubisoft, 2018; Ubisoft, 2019b)

According to Ubisoft (2020b), Ubisoft was able to establish a big fanbase across all the platforms, agregating a lot of followers on different social media pages: including 5.7 million followers on Ubisoft Facebook (Ubisoft, 2020c), and 7.5 million followers on Ubisoft Twitter (2020e).

Ubisoft has experinced rapid growth for past years according to their annual report Fig. 20.
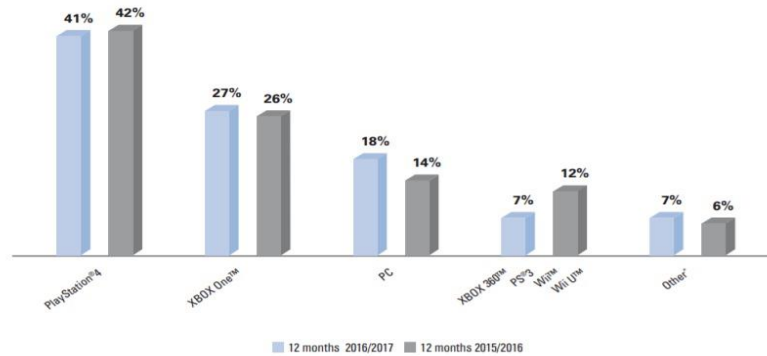
Net bookings
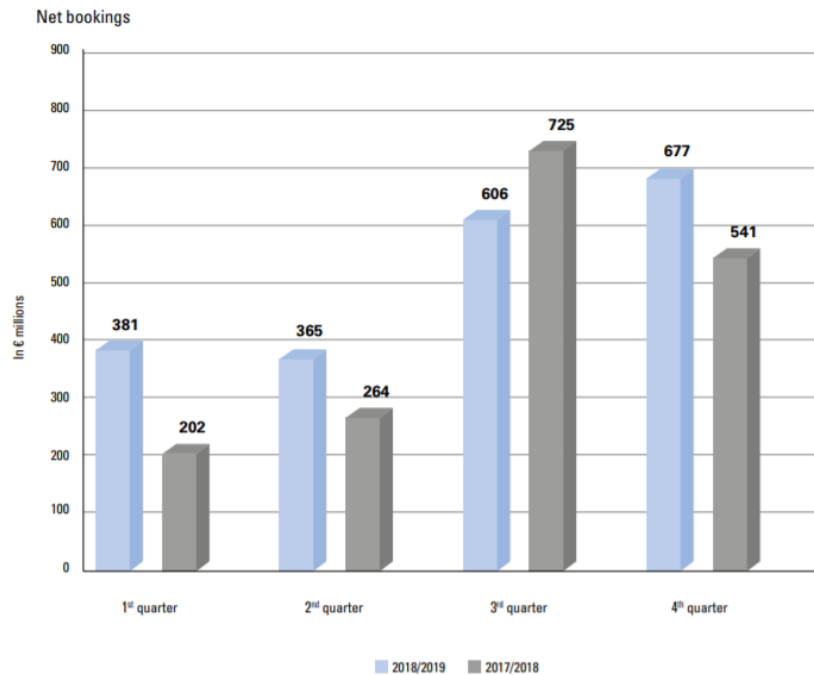
[Fig. 20] Bar chart of annual earnings by quarters. Y axis net gain in millions, X axis quarters of years 2018/2019 against 2018/2018. (Ubisoft. 2019b).

Ubisoft (2020a) has a lot of games in production pipeline. These games include among others, Watch dogs Legion, Gods & Monsters, Skull & Bones, The Settlers and some others. Such release pipeline ensures continuous and steady revenue growth in the year to come, through preorders of the games that are yet to be released.

Ubisoft created a subsidiary called "Ubisoft mobile" to operate on application and mobile development scenes, which started to expand to the mobile market in 2012. Some of the earliest mobile adapted game franchises of the company received high awards, for example "Rayman Jungle Run" was awarded as the best game of 2012 by AppStore, "Trials Frontier" and "Valiant Hearts: The Great War" were described as TOP games of AppStore 2014 selection. Ubisoft Mobil was tagged as a top developer on Google Play in and it is maintaining this status it up to date (Ubisoft Mobile, 2012).
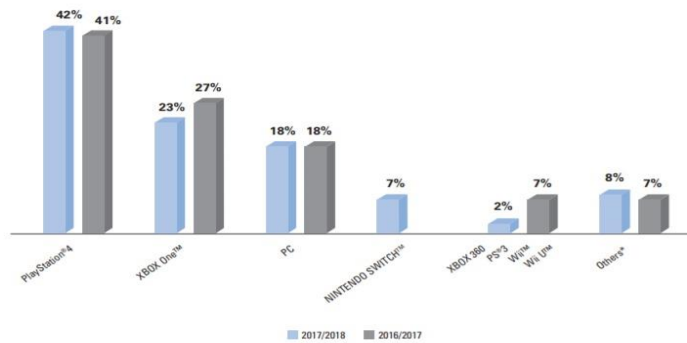
According to Ubisoft's annual reports Fig. 21 – share of mobile games among all the platforms that the company work on began to swiftly grow and generated sales turned mobile gaming to one of the key priorities. This resulted in a significant growth in costs, allocated towards mobile gaming development.
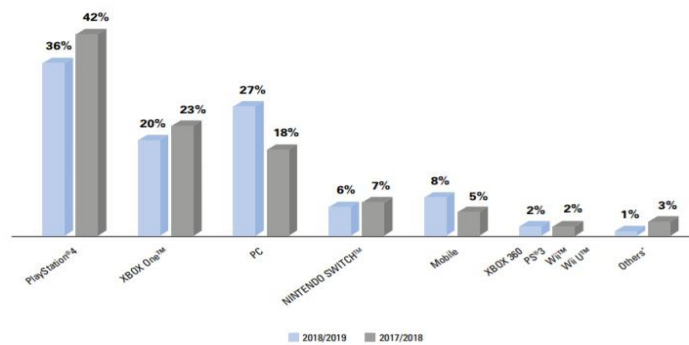
1.2 Sales by platform

1.2 Sales by platform

Sales by platform (Net bookings)

[Fig. 21] Comparison of 3 annual sales by platform reports from Ubisoft. (Data by Ubisoft, 2017; Ubisoft, 2018; Ubisoft, 2019b).

The latest releases of mobile games follow the same freemium pattern, with some addition of different monetization strategies. One of the most standing out cases, which can illustrate the current market condition is "Might and Magic: Era of Chaos" (hereinafter referred to as "M&M:EoC"). (Ubisoft, 2020d).

4.2 Might and Magic: Era of Chaos Case

Conducting a research based on the data provided by Evelyn (2020), it is possible to interpret data and conclude that this game achieved a huge success and became a prominent revenue generator for the developer. After a small stress-beta test during October and November, by the end of November 2019, the game was released worldwide. Game received an overall positive review, that highlighted its notable features, such as nice graphics, very deep settings, big selection of iconic units and heroes, and others. The spike in downloads can be observed in the Fig. 23.

Revenue throughout the whole period of the game existence can be seen in the Fig. 22, the release part was accompanied by huge surge in revenue, people were purchasing an in game currency from the game store to increase the VIP benefits, to move ahead in the storyline and to take leading positions in rankings (Evelyn, 2020).
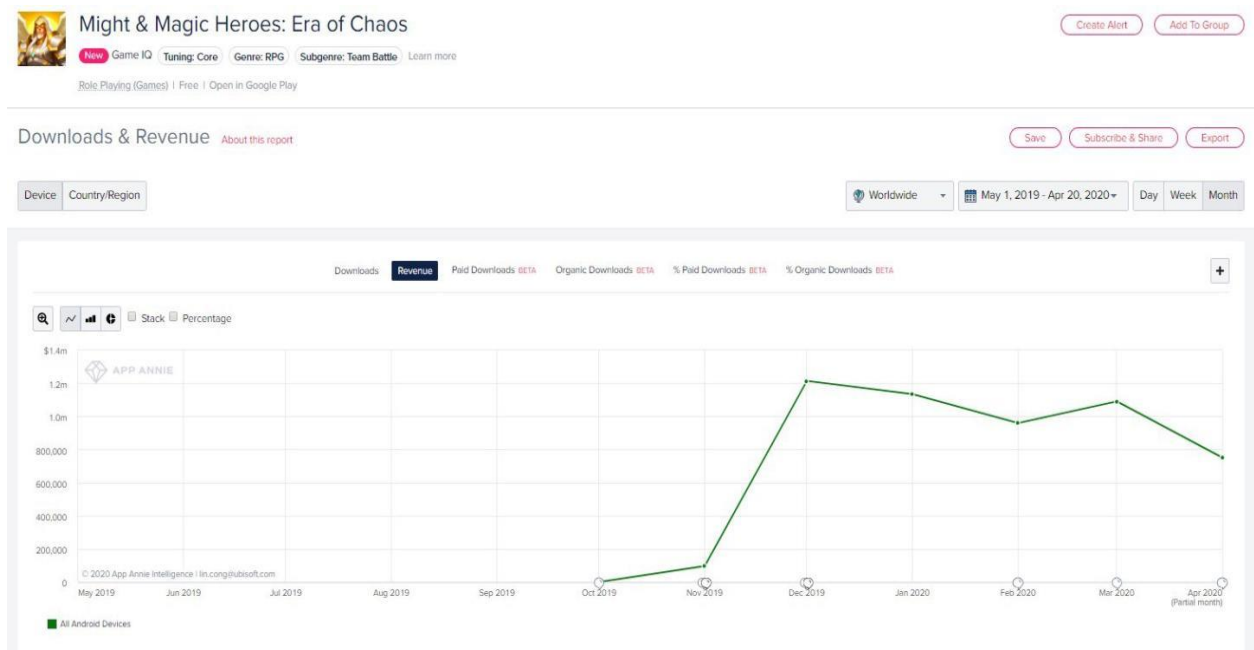
[Fig. 22] Revenue for M&M: EoC. Y axis revenue in $ USD, X axis period of game active timeline by months from: October 2019 - March 2020.
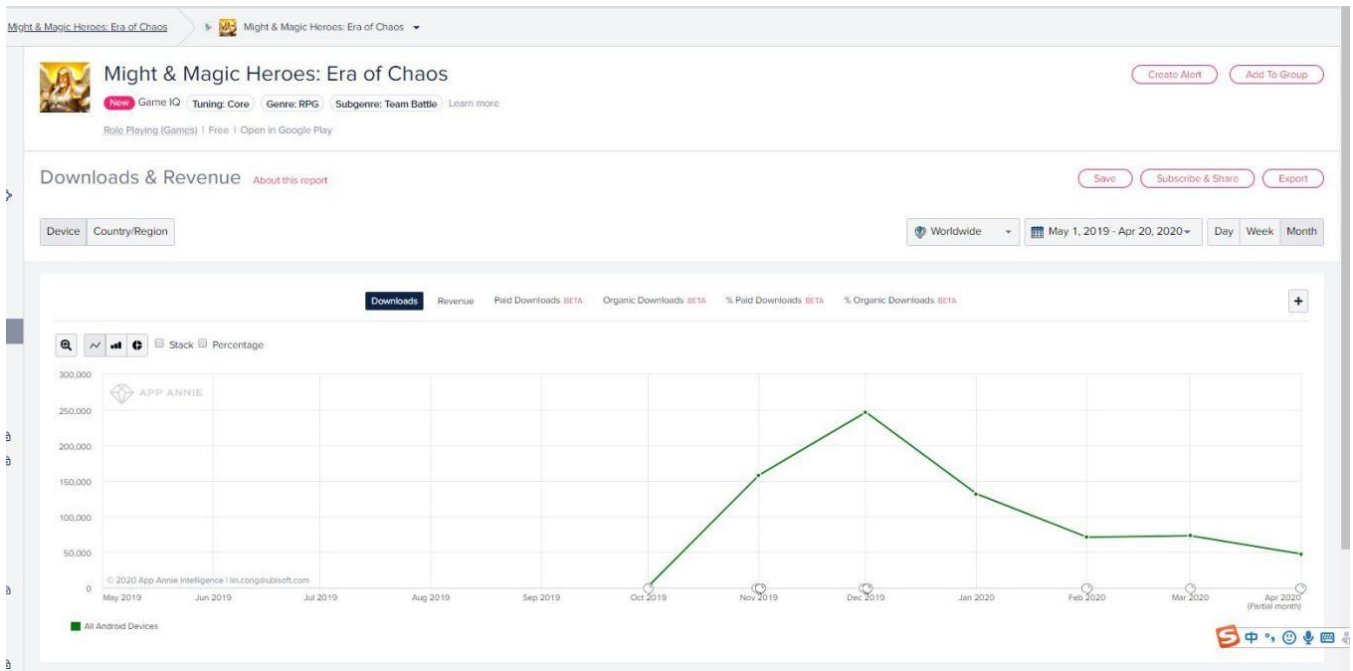
[Fig. 23] Y axis represents downloads during the whole active period Worldwide except China, X axis period of game active timeline. Data by (Evelyn, 2020).

The gameplay incorporated some of the original Heroes series features, which can be observed in Fig. 24. If a customer is familiar with the setting and lore, they will be able to recognize familiar units.

[Fig. 24] Unit selection tab separated by class of units. From game M&M: EoC. (Ubisoft Mobile Games, 2019).

However, the game has undergone severe changes to be adapted for mobile interfaces and gameplay. As every mobile game it is focused on grinding (constant repetitive process of the same

activity for a long period of time), to upgrade the players' heroes and units. Since grinding time was limited by the developer, upgrading the same units, locations and heroes feels as if gameplay is repetitive.

Although a player can control his or her army only in the tactical placement phase which simplifies the process. Battlefield and unit placement are provided in Fig. 25. Nevertheless, this placement will eventually decide the fate of the match, making the in-depth strategy less sophisticated than it was in the original games.

[Fig. 25] Battlefield with unit selection and Hero placement. From game M&M: EoC. (Ubisoft Mobile Games, 2019).

The graphical part of the design was done to allow as many users with older mobile devices as possible to experience the game, main menu can be seen on the Fig. 26, the animations were not demanding, but still relatively pleasant to observe, the combat follows the same rules of minimalistic graphic.

[Fig. 26] Main screen from game M&M: EoC. (Ubisoft Mobile Games, 2019).

Players should understand that modern ways of developing mobile games are different, using freemium model comes at a big price, such as very hard monetization in almost all the aspects of the game.

Monetization in M&M: EoC

The game utilizes one of the most popular monetization mechanisms – freemium, starting from purchasing special in game currency, proceeding with common generated resources that can be obtained through direct payment, continuing with rare heroes who are added into the gameplay as "faction leader, incredibly powerful", ending with some small cosmetic decorations and non-gameplay updates, for example buying new hero skins and profile features.

1. **Gem/valuable currency**

Gems can be purchased through the in-game store, and the prices follow the same pattern no matter when a player plays. First purchase will give an opportunity to purchase a double quantity of the gems, and once obtained, it will be replaced with a discounted amount based on % of the certain package, both examples are presented in the Fig. 27.

[Fig. 27] In-game store with double gems offer and discounted % based offer. Game M&M:EoC. (Ubisoft Mobile Games, 2019).

Gems are being used to purchase almost all internal content of the game, for example they are also needed for units recruiting, buying artefacts, special in-game shop packs and the like.

2. Real money purchases

From time to time developer places special bundles, which can be bought with the real money or gems. Usually price in gems comes at a higher rate compared to the real money price, incentivizing a player to benefit from using real money rather than spending gems for this purchase. Comparison is showed in Fig. 28. Those mentioned packs and bundles come at different price rates, containing a wide range of different items and resources.

[Fig. 28] Offer of packs in-game shop. Game M&M:EoC. (Ubisoft Mobile Games, 2019).

3. VIP System

This system has specifically gained popularity among Chinaese players and was tailored for them mostly. While it seems that the system was not amended or adapted to a regular world's consumer behaviour, nonetheless it managed to gain some traction among all types of game users. The system calculates the real money spent and gems purchased and each level of VIP status progression awards players with special benefits, like daily gifts with premium in-game currency. Moreover, it simultanously gives them an access to a so-called "Privelege Package" which is an offer with higher discounts available to be purchased only once. Such a package helps to lower the difficulty barrier of gameplay by providing players with certain premium items and game artefacts. Last available VIP level for the current game version, level 15, requires cumulative purchases that spent more than 300,000 gems, which means a player should perform at least 47 purchases of 6,480 gems each, which is an equivalent of $100 USD spent for each purchase of that magnitude. Last VIP level is illustrated in Fig. 29. It means that to attain VIP 15 Privilige one should spend at least $4,700 USD in total. The Chinese version was extended by 3 more levels, resulting in VIP 18, which comes for cumulative purchases of 1,000,000 gems equal to $15,500 USD.

[Fig. 29] VIP 15 Package. Game M&M:EoC. (Ubisoft Mobile Games, 2019).

According to data about daily revenues provided in Fig. 26 by Evelyn (2020) and the monetization strategy implemented by Ubisoft, every special event which requires real money spending starts on Wednesday and continues for an average length of four days. The actual term depends whether it is accompanied by a holiday or not. In the former case some additional special conditions like problem or a bug with event, decision of a top management of the company may decide that extension can be applied.

- Event range between April 8 to April 12 inclusive. On April 8 Ubisoft Mobile has released a significant update which includes description of future content, and a new faction (a whole "family" of new heroes and units). An Easter event was a very successful one. Perhaps part of this success can be attributed to a bug in game code, which provided people, participating in it, with more resources then it should. More and more players managed to find out about it every day. Those who used this loophole could continue to benefit from it, so that developers decided not to fix it and use it as an incentive to participate more. Such a bug lasted for 5 days. Revenue gain is supported by Fig. 30, 31.

- Event range between April 15 to April 18 inclusive. This event introduced a rare new hero, a faction leader who comes once per monthly rotation of events. Pricing for this event deal is $100 USD. Revenue gain is illustrated in Fig. 30, 31.
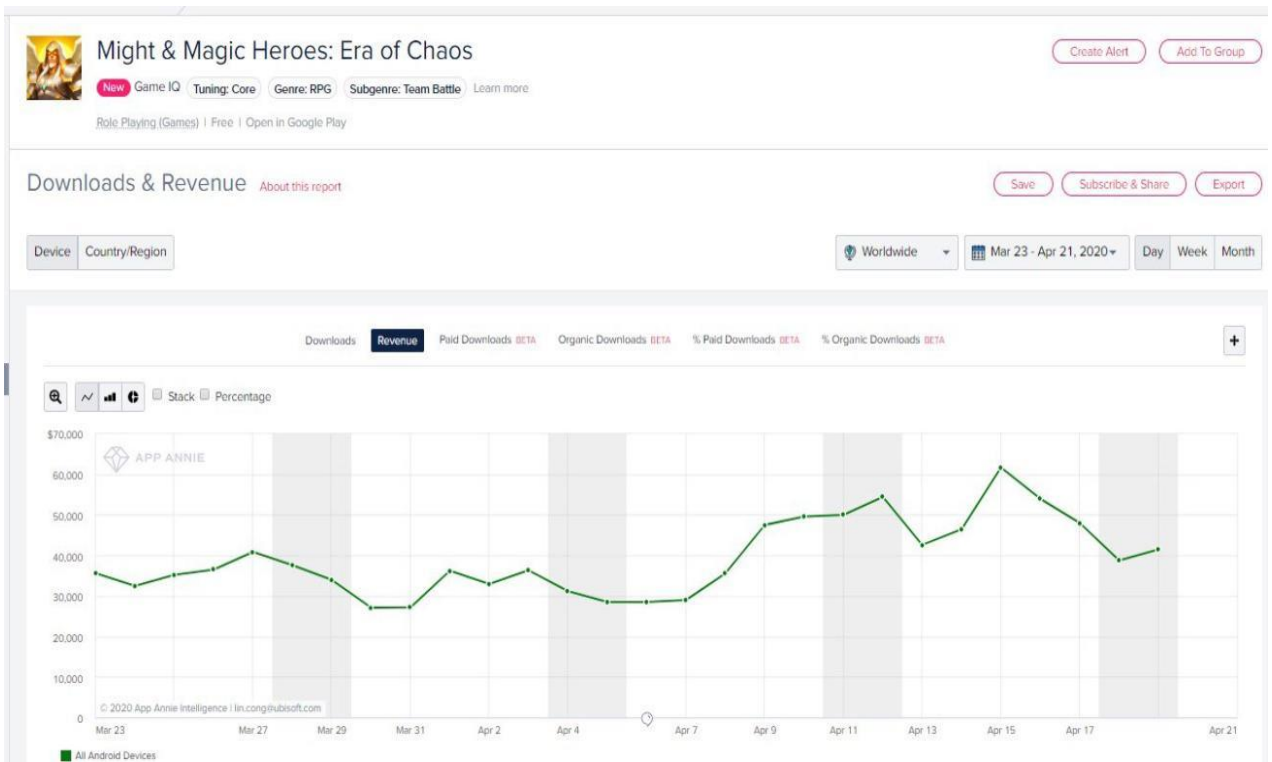
[Fig. 30] Representation of the events according to the latest days. Possible to see the usual Wednesday cycle of the Event schedule, period when a new update was installed, and when a new type of Easter event was applied. Y axis represents revenue in $ USD, X axis represents days. (Evelyn, 2020).
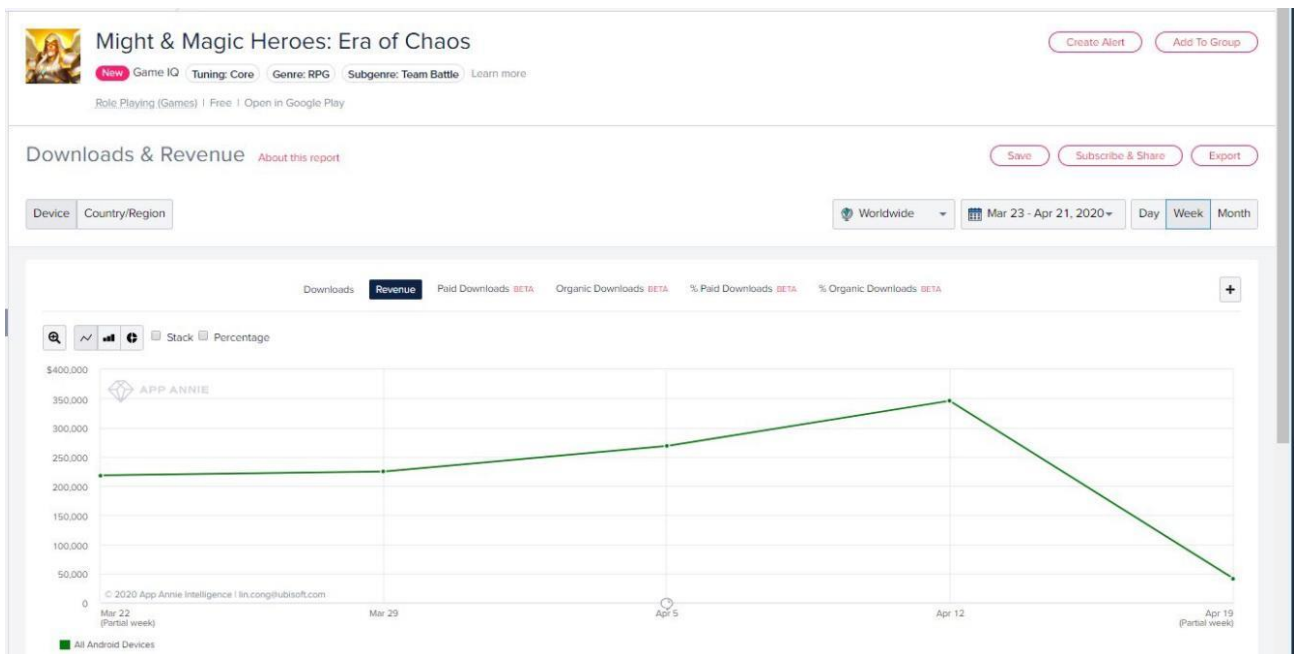

[Fig. 31] Representation of the revenue increase by weeks (excluding week 20.04.2020-27.04.2020) A stable growth is observable, during the Events' weeks according to the events release schedule. Y axis represents revenue in $ USD, X axis represents dates with step of 1 week (Evelyn, 2020).
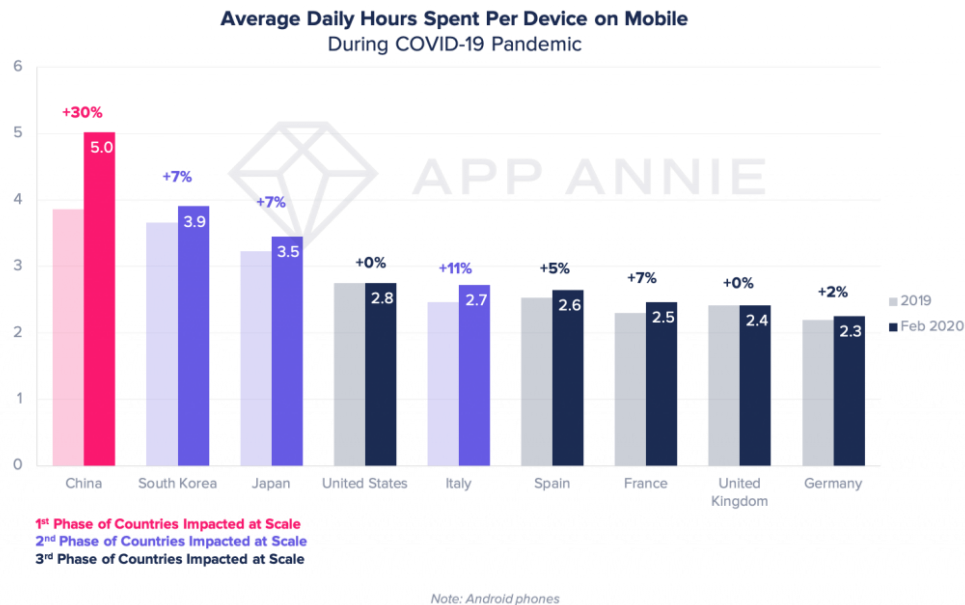
4.3 Results

After analyzing all the information, it is possible to conclude that active loyal customer base got used to the release schedule of new events on Wednesday. However, as a proper strategy to maximize revenue streams, it seems possible to implement continuous refresh of available deals with unexpected bonuses, though with smaller significance, but with meaningful impact. Providing players from China who use the VIP system with additional bonuses and valuables, will give a certain incentive to spend more and grow past VIP 15 barrier. Such attention from the game developer will make it more meaningful for loyal clients to buy and purchase different offerings, even expensive ones. According to case scenario when a loophole gave players an opportunity to buy more items with less spending, gives a good indication that the players are very price sensitive. The price reduction from time to time and discounts of 20-25% hidden as loopholes during special events or anniversaries will affect the overall revenue. Though average spending per person can drop after a while and satisfaction rate will subsequently drop as well, the overall spending might grow, due to constant inflow of new players, as it happened in practice during a "bug" period of the Easter Event.

Considering the latest situation in the world, now it will be possible to expect an increase in revenue due to COVID-2019 situation. Quarantine and self-isolation became mandatory in almost all the countries, meaning that people must spend more time at home and will have more free time in their possession to spare. People now have more time to play and use applications, which leads to a bigger spending. Spending for the latest years are provided in Fig. 32.
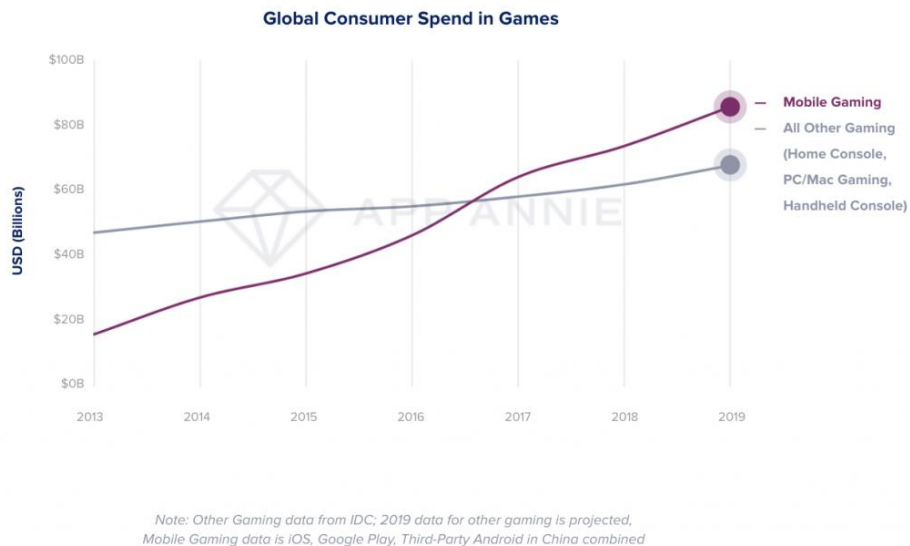

[Fig. 32] Global consumer spending in games, by platform. (Sydow, 2020).

According to the latest research of COVID-2019 situation by Rolfe (2020), it is expected to see an increased growth in average usage of smartphones. By looking at February data which already showed the spike for certain countries, it is evident that there is a certain predictable growth even in countries which were not even locked on quarantine yet. The February data can be observed in Fig. 33.

Average Daily Hours Spent Per Device on Mobile
During COVID-19 Pandemic

1st Phase of Countries Impacted at Scale
2nd Phase of Countries Impacted at Scale
3rd Phase of Countries Impacted at Scale

Note: Android phones

[Fig. 33] Impact on hours spent on mobile during the COVID-2019 virus outbreak. (Rolfe, 2020).

Every country is managing their respective lockdown periods differently. For example, according to Rolfe, (2020), during the most active period of virus spread, South Korea showed a significant growth of downloads, meaning that the average downloads of year 2019, monthly average of January 2020 (which had a lunar New Year on January 25, meaning that students were at home), are lower compared to the weekly average of February 2020, which is possible to see in Fig. 34.

Average Weekly Downloads in Games
iOS and Google Play, South Korea
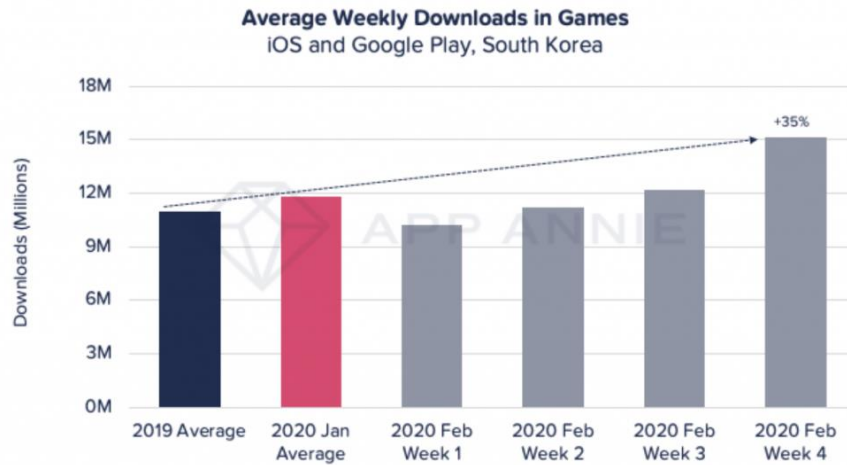
[Fig. 34] Average increase in South Korea, compared to last year average. (Rolfe, 2020).

Smartphones became an integral part of our life and they have entered different aspects of it, or even substituted significant portions of our spare time and activities. They help us to work, travel, read, make pictures and obviously they play a significant role in our entrainment. Mobile phones have entangled us, we are using them for practically everything, being able to connect to other people and gather as much information as needed via games, chats, applications and other services which are integral part of human lives now, no matter whether specific user works, educates, or spends time playing games.

5 Conclusion

Considering all the information provided and researched, it is possible to conclude that mobile industry is one of the biggest growing industries during COVID-2019 outbreak. Most of the people are staying at home, with a lot of free time and quite naturally, they tend to spend their time using their phones, downloading games, trying new applications.

Zoom as a live conference hosting application, gained a huge popularity during COVID-2019 pandemic outbreak. Despite problem in security, Zoom is gaining more and more recognition and popularity. (BBC, 2020) Similar paralell can be expected and is seen in the gaming and entertaining industry.Does it mean it will have a long-lasting impact on a gaming and development industry and any new types for monetization will emerge? According to the obtained data, it is possible to assume that time for creativity and testing is now, but not all of the tests will be successful. People are still getting used to new monetization ways, every country has its own mindset and characteristic traits of people who populate it, which may affect decision making in certain markets. New methods of monetization can provide more accurate data, thanks to a higher customers involvement and sucessful targeting marketing. The approach of accumulating loyal customers is still a necessity and one of the main criteria for future success and new monetization ways. Nonetheless, it is a win-win situation for developers as well, because it results in more users and more spending naturally, which subsequently means more development work is required, more revenue streams can be accumulated, and more ways to test monetization possibilities and gather data about it from new customers will be available. It is possible to assume that the growth in overall gaming and application utilization rate will be experienced for a long period of time after COVID-2019 outbreak. Therefore, for those who seek to enter the market, this current situation creates a perfect sandbox to test their applications and their monetization strategies, trying to reach more diverse customers and eventually to have a better chance to survive in a very competitive and constantly developing market.

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Document for registration BACHELOR THESIS

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Work topic in English: Mobile Monetization and its Practical Use in the Current Development Environment.

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Theses guidelines:

The aim of the thesis is to evaluate the monetization market and its tendencies, technologies used to implement some of those and to show it with a real-world examples of actual games and applications.
Outline:
1. Introduction
2. Monetization in mobile applications and corresponding field
3. Development and monetization tools
4. Case study
5. Conclusion

Recommended resources:

King, D. L. and Delfabbro, P. H. (2018) Predatory monetization schemes in video games (e.g. loot boxes) and internet gaming disorder, *Addiction*, 113(11), pp. 1967-1969. doi: 10.1111/add.14286.
King, D. L. and Delfabbro, P. H. (2019) Video Game Monetization (e.g., Loot Boxes): a Blueprint for Practical Social Responsibility Measures., *International Journal of Mental Health & Addiction*, 17(1), pp. 166-179. doi: 10.1007/s11469-018-0009-3.
Walker, R. (2015) *From Big Data to Big Profits : Success with Data and Analytics*. Oxford: Oxford University Press. Available at: http://search.ebscohost.com/login.aspx?direct=true&db=nlebk&AN=996360&lang=cs&site=ehost-live

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