Monetization of New Applications

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ABSTRACT

When personal computers and afterwards mobile phones have completely changed our approach to work and to everyday life, the appearance of desktop and mobile applications have done the same in a very short period. Applications are now an important part of everyday modern life. A huge number of the world's population owns a mobile device on which millions of applications are available. Whether they are free to download or not, all applications can earn money through monetization. Monetization is the process where a product or service is converted into money. App monetization can be achieved in many ways and every new app on the market must carefully choose an adequate monetization strategy. For the purposes of this study, fifty applications have been selected out of which the authors selected and analysed nine applications which they considered to be the most representative. The authors reached and presented in the paper several conclusions about the monetization models of successful and unsuccessful applications. They have also acquired important knowledge about the advantages and disadvantages of individual models and gained an understanding of how monetization strategies change in accordance with the life cycle of the applications themselves.

Key words: *Monetization, Application, Digitization, Internet.*

1. Introduction

The development of new technologies always introduces new opportunities for progress and brings changes to all human activities that need to be adapted to them. Modern life is characterized by rapid changes caused by the emergence of the Internet, mobile technology, and digitization. Digitization has significantly changed the way of life and introduced a revolution in all spheres of human life. Digitization has also had a great impact on the business world. It enabled the automation of industrial processes and increased productivity. The ability to access a large amount of data has improved the decision-making process. The opening of new markets and the increase in the number of potential customers opened new earning opportunities. Communication has become faster and simpler than ever before, because with the introduction of mobile technology, the exchange of information can take place in real time all over the world. From the first public call via mobile phone in 1985, to the first ever sent

SMS message in 1992 and modern smartphones, mobile telephony has completely changed the world we live in in less than forty years. (Križanović, 2020)

Very soon after calls and SMS messages, in 1997 the first applications appeared on mobile phones. Ten years later, the first application stores appeared, which had only about five hundred applications available. Today, millions of applications can be found in application stores, and all trends point to the further development of this market. As with the creation of most new products or services, the creation of new applications is an enterprise with an uncertain outcome. Although there are many factors that are impossible to influence, knowing the market can greatly reduce this uncertainty. Planning is a prerequisite for the success of any business, so even when creating a new application, every step in its development must be carefully planned before it is released on the market.

There are many expert and research articles that provide comprehensive survey of monetization and explain individual cases of monetization in detail, but given the specificity of the topic - all surveys and research quickly become out of date considering the high intensity of changes in the market application. Among the most prominent studies is the study of Ailie K. Y. Tang (2016) that analyses applications as promotional tools in mobile advertising and digital marketing. Dinesh Elanga (2018), on the other hand describes the functioning of app monetization with an emphasis on the Internet of Things market. Gil Appel, Barak Libai, Eitan Muller and Ron Shachar (2019) offer a short overview of application monetization based on the data from 2018. Aniebiet Inyang Ntui (2021) explains the positive and negative consequences of individual monetizations based on a six-month study of monetizations. Young-Jin Lee (2021) reveals that developers of mobile applications change their monetization strategies over time (from paid to free applications and vice versa), and finally, Julian Runge, Jonathan Levav and Harikesh S. Nair (2022) offer a description of a Freemium model for generating monetization.

When observing the global market from the perspective of monetization of Croatian applications, it can be concluded that there are no relevant studies that would answer the question in which direction potential application developers should go. Therefore, the goal of this paper was to investigate ways of monetizing applications at a global level in order to provide information to Croatian app developers and help them decide which form of monetization to choose.

2. Monetization

In the context of state finances, monetization means "converting state debt from a form of financing through debt securities into money, thereby increasing the money supply (enciklopedija.hr)". Monetization can also mean "the use of cash surrogates in function of turnover and payment (enciklopedija.hr)". When talking about app monetization, the following definition applies monetization is "the conversion of less liquid or non-monetary assets into money (enciklopedija.hr)". Today, monetization primarily refers to "the process of turning something that does not bring profit into cash." (Ganti, 2022)

For an application to become part of a business activity, it can only do so by generating income, which is realized through monetization. "If a product does not have built-in monetization mechanisms, then it is usually:

- An experimental product within a well-funded larger company that can afford monetary losses.
- A start-up company that is backed by an entrepreneur that has yet to be monetized in any way and that has the necessary funds for maintenance and shows potential for growth.
- A side project that is worked on for fun and that may never become a serious business." (Holmes, 2022).

Although today it is most often used when generating profits from Internet applications or other digital sources, monetization is not a new concept. Television and radio are the media that used monetization by advertising to generate income long before the advent of the Internet. And even earlier, print media (newspapers and magazines) started monetizing through advertising. In many cases, monetization seeks innovative methods of generating income from new sources. Monetization can also be realized through these two special forms (Kenton, 2022):

- **Commodification**: A special form of monetization by which a profit is made through the privatization of a previously public good is called commodification. An example of commodification is the transfer of public road usage fees to private hands.

- **Liquidation**: A form of monetization where financial resources are obtained by selling inventory or assets. Finances can be obtained in this way in a short period of time. It is most often used by companies that end their business through bankruptcy or change of business model.

Sometimes there will be a built-in model of monetization from the very beginning of the company, while in other cases it will be necessary to reach some level of security in the business that will be monetized later. Too much focus on the monetization process in the early stages of business development can actually stall progress.

The concept of monetization has become especially important in the modern digital economy. The emergence and rapid development of the Internet and the growing number of users of personal computers and mobile phones also led to the creation of new monetization models. Generating profits is possible today in ways that did not exist at all not so long ago.

Digital media are all media that publish or offer their media content via the Internet or via digital networks and devices. The content they publish can be displayed in different formats. Content can reach the user in the form of text, audio, video, animation, graphics, or a combination of several digital forms. Digital content can be accessed through several types of devices – mobile phones, televisions, personal computers, tablets, game consoles, etc. Even media that were created before the advent of digitization (daily newspapers, magazines, radio, television, books, etc.) had to adapt to changes are still unthinkable today without some digital version. Daily newspapers and magazines are far less present in printed editions and much more in online editions or mobile applications.

The biggest difference between traditional and digital media is their interactivity. While traditional media provided only one-way communication, today's digital media achieve two-way communication. (Ferenčić, 2012) Digital media, apart from the format in which they appear, can also be distinguished by the type of content they display. Types of content in digital media can be blogs, social networks, ads, video games and books in electronic form (e-books), etc. (Goldberg, 2019) Digitization brought another type of change that the media had to adapt to. Today, more and more media content can be accessed completely free of charge, so digital

media owners are forced to look for alternative sources of income. The main way digital media generates revenue today is monetization. Monetization of digital media can be defined as turning digital content into a source of income.

Monetization of websites is considered to be the conversion of its content into money. There are several ways to make money online. The total number of ways to monetize a website varies depending on the author, and the most frequently mentioned are earnings through advertising, sale of space to advertisers, donations, sale of products and services, sponsored content, courses, and training, charging for access to content and sale of the website.

A podcast is an audio recording that is uploaded to a user's device or viewed online. The principle of operation is similar to radio transmission, but with one important difference – podcast content can be listened to at any time. (Fedewa, 2022) The content of a podcast can be various: analysis of sports events, political topics, video games, technology, etc. "Podcasts today are a special kind of entertainment and are actually a modern type of talk show". (Fedewa, 2022) The specificity of podcast monetization is that there is no visual but only audio content, but it can also be turned into earnings. A podcast can be monetized in these ways: sponsorship, product sales, donations, or sharing content on YouTube.

3. Applications

The term "application" used to be most widely used in two situations: as a synonym for the term "implementation" or "use" and as a term meaning "the application of one object or material to another (jezikoslovac.com)". With the advent of computers, in addition to these two, there is also a third meaning of this term: "an application is a computer program created to perform a task or a dedicated program (jezikoslovac.com)". Computer applications are a relatively new term, so the related definitions are diverse. The most commonly used definition of the term "application" reads: "An application is a self-contained package of software that allows a user to perform specific tasks on a mobile device or personal computer."

Whatever the purpose of an application, its content has the possibility of monetization. Before even starting to think about the income from an application, it is necessary to deal with the application itself. Creating the app itself is the first but most important step in creating potential value. To identify the best way to monetize a new application, it is first necessary to establish all its advantages and disadvantages. A thorough understanding of the business goals to be achieved with the new app will determine the business strategy and approach to app monetization.

All types of applications can be divided into two basic groups: mobile applications and desktop applications. The biggest advantage of desktop applications over mobile applications is that they are accessed from a larger screen and have more memory available to work with. The second division of applications is based on the criteria of categories in Google Play and the App Store, where applications are classified into 32 and 24 categories, respectively. According to numerous authors, this large number of categories can be reduced to six basic ones (Blog. duckma, 2022): "Lifestyle" applications, useful applications, social network applications, games and entertainment applications, productive mobile applications and news and information applications.

3.1. Creating applications

Before creating a monetization strategy, it is necessary to complete the first step in the process, which is the creation of an application. Creating an application is a process that can be time-consuming and tiring, but also rewarding. When creating a new application, it is first necessary to have a design concept. The concept of creating an app involves developing potential ideas for the app, while answering these questions:

- Who are the potential users of the application?
- What is the purpose of the application?
- What are the most important features of the application?

After the preparation of the concept, the application design follows, which includes creating a user interface and finding graphic solutions. Designing an application is an important step in its creation, because a better design guarantees a more pleasant user experience and, accordingly, a more successful application.

The next step is to develop the application. In this step, application functions are created by programming in the default programming language. There are numerous more or less well-known tools and programs for application development. The choice of the program in which the application will be created depends on the platform for which it will be intended, but also on many other technical details. The programming languages most often used to create mobile applications are: C, C#, Java, Python, Swift, Kotlin, Ruby, etc. During this step, care should be taken that the application works without errors and performs all the tasks intended. Once the app is developed, it is time to release it to the market. This is done on one of the platforms that further distribute the applications (Google Play Store or Apple App Store).

3.2. Marketing and distribution of applications

A newly developed app can be superbly designed, easy to use, useful and fun. The ways of its monetization can also be of high quality, reliable and adequate. All the steps in the development of the application can be done flawlessly, but if the potential users of the application do not know about it, there will be no monetization of the application. Only when new app creators do a little more research on their industry, they will find that monetizing them requires more than just a mobile website. Attracting the attention of smartphone users is perhaps the most important step in monetizing new applications. So, the question arises: how to spread the word about the existence of a new application? (Patel, 2023).
There are several ways to advertise mobile applications, but for any type of marketing, the basic prerequisite must first be met, which is that the application that goes live must be something that users need. To successfully attract users, it is necessary to apply the correct marketing strategy. "Broadly speaking, a marketing strategy can be defined as a formalized set of actions needed to promote a mobile application using special channels." (Dogtiev, 2023). Marketing strategy is the basis of the success of any business. Choosing an adequate marketing strategy attracts consumers, increases sales and builds the strength of the company's brand. The life cycle of any application can be divided into three stages:

- before being launched on the market
- the very moment of launching on the market
- after being launched on the market.

Once the application is created, it needs to be marketed. In addition to the two largest and best-known platforms for the distribution and sale of applications – Google Play and Apple's App Store, there are also many other more or less well-known distribution platforms. Each distribution platform offers different benefits and therefore it is useful to deploy the new application on as many platforms as possible. Part of the process before deploying an app on any of the platforms consists of mostly the same steps. With some application distributors, there is no official data on the number of available applications, while with others, deviations are possible depending on the data source.
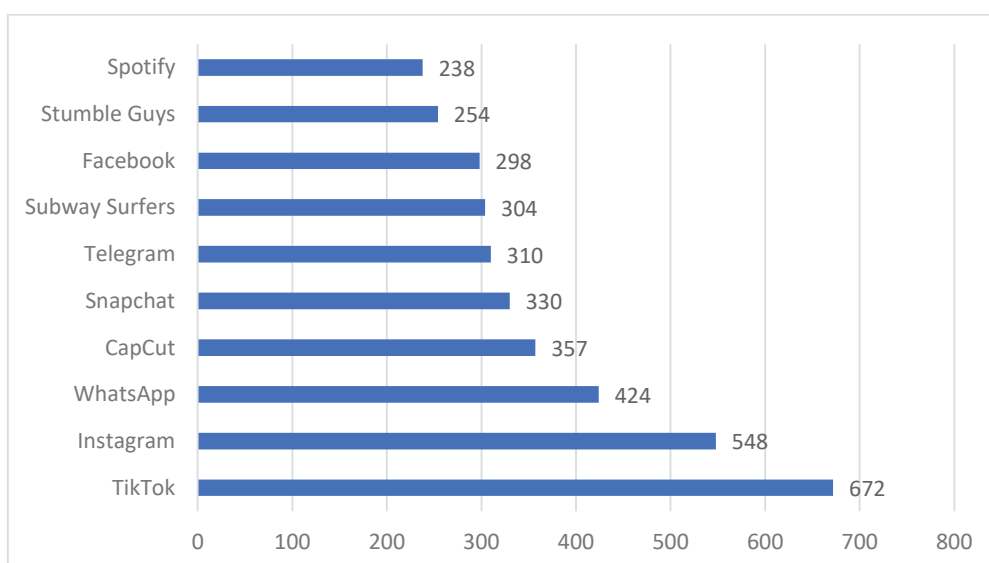
The following charts show data on the trend of app downloads over the past seven years and an analysis of the most popular mobile apps used in 2022.

Chart 1: Number of mobile app downloads worldwide from 2017 to 2023 in billions
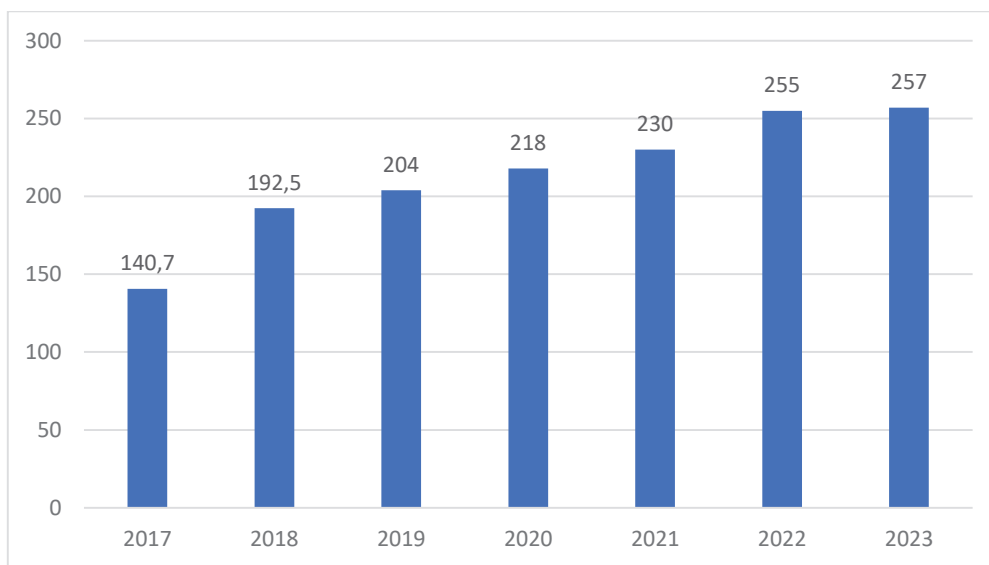
Source: Statista.com (accessed on 24/03/2024)

Chart 2: Leading mobile applications in the world in 2022 by number of downloads in millions

Source: Statista.com (accessed on 24/03/2024)

It is evident from the previous charts that the application market has been constantly growing since 2017, however in the last few years the trend of application downloads has slowed down, and the most popular applications are still the applications intended for social communication (TikTok, Instagram and WhatsApp).

4. Method of research

In order to make the research results as relevant and comprehensive as possible, the authors analysed 50 applications that are regularly used in everyday activities and whose monetization is relevant for drawing useful conclusions that could potentially be applied in future monetization in the Republic of Croatia. The authors created a list of 50 applications that can be classified in five fields: social networks, games and entertainment, news and information, lifestyle, and applications for creating content, services and goods (Productive applications) (see Table 1). Out of 50 applications the authors chose and gave a more detailed description and analysis of the most relevant monetization models from each field. The survey has revealed that nine applications listed in the column *Analysed applications* in Table 1 are the most relevant examples of good or bad practice for future monetization in the Republic of Croatia.

Table 1: List of analysed applications classified by the field of activity

N.	Field of activity	Analysed application						
1.	Services and Goods (Productive applications)	Yplan	ClickUp	Calendly	Slack	Loom		
		Ideri	Shift	Habitica	Zapier	Toggl		
2.	Lifestyle	Swetcoin	Calm	FaceApp	KineMaster	Webtoon		
		Strava	FitOn	Burn.Fit	Jefit	Daily Workouts-Fitness Coach		
		Tinder	Bumble	Hinge	Happn	Raya	Match	
3.	News and Information	AccuWeather	Weather	MyRadar	Windy	Weather Live		
		The Guardian	BBC News	Reuters	The New York Times	The Washington Post	Al Jaazera English	
4.	Games and Entertainment	PokemonGo	MonopolyGo	Roblox	Brawl Stars	Candy Crash Saga	Clash of Clans	Coin Master
5.	Social Networks	WhatsApp	FacebookMessanger	Facebook	Viber	Instagram	Snapchat	

Source: Authors

5. App monetization

Due to the increasing popularity of mobile applications, being a direct consequence of the growing number of mobile phone users, the interest in making money through applications is also rising. The application can be monetized in numerous ways and it is only a matter of which of the available monetization models will be chosen. It is crucial to integrate the monetization of a new app right from the moment the app goes live. The selected model can always be abandoned, replaced with another one or another one can be added to it. Changing the way of monetization is a common practice in the application market because many factors can change

over time from the moment the application is put on the market. Many rankings of the best applications can be found on the Internet, so on one of them we can see that five of the ten best applications are free (top10.com, 2023). All non-free apps use a one-time download payment model. With some free applications, there is an option to pay for the *ad-free* version.
The mentioned models of app monetization are not the only ways to monetize it. Monetization can also occur by some less used methods that still cannot be counted in monetization models (e.g. selling an application or using software to increase profits).

Of the total number of app monetization models, some of them are adequate for all types of apps, while the remaining ones are applicable only to certain types. Each model has its own advantages and disadvantages, as well as the types of applications for which it is best suited – for example, some models are suitable for new applications, others for existing applications or for applications with a large user base, etc. The most well-known app monetization models are (businessodapps.com, 2022):

a)   Monetization through advertising

The time that mobile phone users spend browsing the Internet or using applications on their smartphone is increasing. Some of this time can be used to serve ads to users. Advertisers therefore try to place their advertisements in a targeted manner, so that mobile phone users see advertisements on the screen that they might find interesting. Monetization through in-app advertising is one of the more popular methods of app monetization. Statistics show that 37% of applications worldwide use some form of advertising (Statista.com, 2022).
There are three ways by which in-app ads can generate profit (Patel, 2023):
- **CPM** (*Cost per thousand impressions*): Payment is made after 1000 users view the advertisement in the application
- **CPC** (*Cost per click*): Payment is made every time someone clicks on an advertisement
- **CPA** (*per action*): Payment is made every time someone clicks on an advertisement and performs the requested action.

b)   Paid download of files

The oldest and most direct app monetization model is paid file downloads. With a one-time payment, the user gets full access to all the benefits of the application. Earnings with this model are immediate, but that's why there are drawbacks that make this model less and less used. "The problem with this monetization model is that it's hard to convince someone to pay for something they haven't had a chance to try. Also, it is worth knowing that both Apple and Google take 30% of each charge" (Patel, 2023). If this monetization model is chosen, it is necessary to carefully assess how much each download of the application will be charged.

c)   In-app purchases

In this model, applications are free, but additional benefits are paid for. Under this model of monetization, we include the so-called "freemium[1]" applications. In-app purchases are most often used in video games. The game is free to use, however extra levels of some video game, extra lives or extra game currency are charged. In order for this model to achieve the desired effect, it is necessary for users to get used to the application and only then consider the

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[1] The term "freemium" was created as a combination of the term "free" and "premium". It indicates a business model in which basic content is free, and additional content is charged. (Segal, 2022).

possibility of paying for additional benefits. For the success of this model, it is necessary to find a balance between too little and too much content in the free part of the application.

d)   Subscription

The subscription model is used for applications that potential users will use for a long period of time. In order to get the maximum profit from subscriptions, there is a frequent case of a *free trial* period in which potential subscribers could know exactly what they will get with the subscription. This method of monetization is most often found in entertainment and news applications. The balance between available content and subscription-based content is key to the success of this monetization model. However, before introducing any form of subscription, you should be aware that the vast majority of users do not want to pay anything, so the biggest risk when introducing a subscription is the possibility of losing already acquired users. Before introducing a subscription, it is necessary to know the answers to the following questions (Holmes, 2022):

- Are users willing to pay for subscription-based services and can they afford it?
- Is the offer valuable enough that the user would be willing to pay for it every month?
- Is the offer sufficiently different from others on the market to prevent users from switching to someone else for a similar or lower price?

The advantages of a subscription are that it results in a more stable income and subscribers are likely to use the app longer than other users. The disadvantages of subscription are that the content of the application must be updated regularly and switching from a monetization model to a subscription can result in losing users.

e)   Sponsorship program

This method of monetization is generally not suitable for new applications because it is difficult to expect that their potential will be recognized from the very beginning. Once the user base grows, some brands may become interested in sponsoring. By using a sponsored app, business entities have the opportunity to expand the market and app owners to increase earnings. The biggest advantage of this model is that it interferes with the user experience the least of all models.

f)   Sale of goods

Any mobile application can generate additional profit by selling goods on the Internet. Anything can be sold: toys, shoes and clothes, tools, etc. Selling does not have to be the primary activity of the app owner, but it can be used as an opportunity for additional earnings. "To encourage app owners to adopt this strategy, Amazon launched a service called "Merch by Amazon" that allows publishers to promote their products on Amazon's pages." (Patel, 2021).

g)   Collection and sale of data

Applications connected to the Internet collect large amounts of user data. User data mainly include the user's email address, personal preferences and memberships in social networks. Researchers in various fields are always interested in all kinds of user data, which means that app owners can sell these data to researchers and increase profits. With this model, profit can be made in two ways: the data can be sold to a company or the owner of the application can use

it. The first disadvantage of this app monetization model is that it raises the issue of data security and confidentiality. Another problem is that customers can develop a feeling of distrust towards the company. The advantage of this model is getting to know the user, because knowledge about user preferences can be used for a more adequate selection of advertisements. (Patel, 2021) An additional advantage of this model is that this is one of the few monetization models that does not disturb the user experience.

h)   Transaction fees

Collecting transaction fees through the app is a simple and effective way to monetize it. In order for this model to be applied, there must be an option to purchase products or services in the application itself, which is mainly achieved through advertisements. Profit is made in a way that every time someone makes a purchase through the application, its owner receives a pre-agreed fee. The advantages of this model are that it does not affect the user experience when using the application and does not harm the user's credibility. When introducing transaction fees, care should be taken that they are not too high, but not too low either.

6. Empirical research

For the purposes of this research, fifty applications have been selected with an emphasis on nine of them that the authors consider to be the most representative for analysis (WhatsApp, Pokemon Go, The Guardian, Accu Weather, Tinder, Strava, Ideri, Sweatcoin and Yplan) and their monetization models have been examined in detail. The applications have been selected by representing all application categories in order to make the results as objective as possible. All selected apps are available through online app stores. Data on the monetization models of the applications inspected have been collected from various websites, and the research results indicate the most popular ways of app monetization among the selected ones and what model corresponds to which type of application. Below is a description of the nine most popular selected applications and their monetization models, based on which the final conclusions were reached.

- **WhatsApp**

WhatsApp application was created in 2009 by Brian Acton and Jan Koum. WhatsApp is designed as an alternative to expensive SMS services. "This application is free to use and install. It can be installed on all platforms - iPhone and Android smartphones as well as Mac and Windows PC operating systems. It allows users to make calls and exchange text, photo, audio and video messages with other users around the world, regardless of the type of recipient's device.
Initially, the use of WhatsApp was charged as follows: $1 for downloading the application and $1 per year for its use (Page, 2022). At the peak of the use of this model, WhatsApp had about 700 million users, so it can be estimated that the earnings were about 700 million US dollars a year. In 2016, the company Meta announced a change in this collection strategy because they believed that this method of monetization was limited and that they would not be able to generate significant income for a long period of time. Very soon after this announcement, a new announcement arrived - the subscription period has come to an end and WhatsApp has become completely free to use. WhatsApp announced this news on its official blog on 18 January 2016. Part of the announcement read as follows: "Of course, people are now wondering how we plan to maintain the existence of WhatsApp without subscriptions and whether this announcement

means that we are introducing advertisements. The answer is no. Starting this year, we will test tools that will enable communication with business entities and organizations (Blog.whatsapp, 2016)". In other words, WhatsApp stopped charging private users and introduced charging companies and organizations.

WhatsApp actually makes up a very small part of Facebook's total revenue, and today almost all of that revenue is generated by charging business users for services through the WhatsApp for Business application. WhatsApp is an example of how an app monetization method can change as other factors change - in this case, the change was most affected by the total number of app users. In the beginning, WhatsApp was free, so very quickly it switched to the principle of charging for use with an annual subscription, and ultimately it abolished any charging for private users and made money only from companies that use its services.

- **Pokemon Go**

Since video games for mobile phones are one of the most used types of applications, an example of the monetization of some of them was analysed for the purposes of this paper. One of the most popular mobile applications today is the Pokemon Go game. It was created in 1996 and since then it has turned into a global phenomenon. The application is the property of the company Niantic. Today, there are Pokemon movies, playing cards and video games, the most famous of which is Pokemon Go.

"Pokemon Go is a free mobile app that combines gaming with the real world. The game uses user geolocation and mapping technology to create an "augmented reality" where players can catch Pokemon in real locations. "Today, Pokemon Go generates revenue from various sources: selling digital goods, advertising, organizing events and selling hardware. The game itself works on the "freemium" principle.

- **The Guardian**

The Guardian is a British daily newspaper founded in 1821. After several years of losses until 2011, they turned to online publishing, and there were plans to become the first British daily newspaper to be completely online (Sabbagh, 2011). The Guardian launched its first mobile app in 2009. It was an iOS mobile app, and two years later an Android app was launched. Like many other newspapers, The Guardian faced financial difficulties in 2016, which forced the management to lay off 400 employees. (Davies, 2018) The first step in getting the newspaper out of the crisis was to ask for one-time and annual donations from readers. Donors, depending on the amount of the donation, got access to special contents and benefits. Benefits included an annual subscription, tickets to special events, free access to mobile applications, etc. The newspaper's management, motivated by the statistical data that 80% of online media readers will never pay a subscription fee, no matter how much it is, decided not to introduce any form of payment for reading its online media content. Instead, they introduced membership fees and soon reached a million members. The example of monetization of The Guardian newspaper is not a classic example of monetization of mobile applications, because the actions of the newspaper's management do not only apply to the mobile application, but to the company's overall operations. This example was chosen because it shows how in difficult periods, by making the right decisions, content monetization can be maintained and even improved.

- **AccuWeather**

The specificity of weather forecasting applications does not leave them much room for manoeuvre when choosing a monetization model, and although there are some additional

contents that can be monetized, placing advertisements is the main way of generating profit. The company AccuWeather was founded in 1962 in the USA. In 2021, the company's website was in the top 50 most visited worldwide. Today, they are ranked as the third best weather app. AccuWeather can be singled out for two specific attempts to increase profits. The first way AccuWeather tried to improve the monetization of its ads was by installing a program that would bypass the ad blocking programs on the devices of app users[2]. In order to achieve this, they decided to cooperate with the company Blockthrough. The program that Blockthrough installed on the AccuWeather app would detect whether the user is using an adblocker or not. If it does, then it would check if the Acceptable Ads option is turned on. During the period of using this program, AccuWeather doubled its revenue from advertising. Another way to improve financial conditions was attempted by AccuWeather in a somewhat controversial way. User location is a private information and can only be shared with the user's permission. "AccuWeather was caught sending user location data to data monetization companies, even when the user location sharing permission was turned off". (Whittaker, 2017)

- **Tinder**

Tinder is the world's most famous online dating app. Tinder owes its success mostly to its creativity. "In 2013, Tinder revolutionized online dating by introducing a simple selection system. Tinder uses two monetization models to make money from its app: subscription and in-app purchases (buying features that increase the user's chance of finding a suitable partner). The Tinder app is a great example of how creative solutions, more than any other aspect of app development, are responsible for successful monetization.

- **Strava**

The application called "Strava" is a free application for cyclists, runners and swimmers, which is used for monitoring sports activities, physical fitness, kilometres passed and processing statistical data on the user's sports activities. Although Strava can be used to record results in all sports activities, most users are cyclists and runners. In 2022, Strava had more than 100 million users, and in the same year, more than 90 million photos were shared through the application. In 2021, the Strava app reported revenue of 167 million US dollars, and in 2022, it generated profits using three different monetization models: **subscription, sponsored challenges** (Strava sets challenges sponsored by different companies) and **information sales** (information is sold mainly to sports equipment manufacturers and services in order to design future products and services).

- **Ideri**

Ideri is a German company that produces and sells software. There are several products in the form of applications that this company offers in its range - Ideri note, Ideri move, Ideri pace and Ideri packaging suite. All applications are available to install and use on all mobile and desktop platforms. The basic contents of all the mentioned Ideri applications are free, and monetization of the applications is achieved in two ways: by subscription or by a package that contains subscription and maintenance. Ideri's management has recently been leaning towards a subscription option instead of a package that includes sales and maintenance. The reason for this is that the subscription model is estimated to be more profitable for both the company and

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[2] About 43% of mobile device users have an ad blocking program installed, which is a big problem for applications whose only profit sometimes comes from advertising.

the customer. The customer would ultimately spend more through the subscription but would not have large costs at the beginning of using the application. For customers who already have one of the applications, a rule has been introduced that after two and a half years of using the package that includes sales and maintenance, they switch to a subscription. Ideri is an example of how you can always find a better app monetization model than the existing one and how switching to a new model does not have to be a drastic move but a gradual adjustment.

- **Sweatcoin**

This app measures the number of steps a user takes in a day, either running or walking. In 2022, Sweatcoin had over 110 million users and cooperated with over 600 partners. What makes the Sweatcoin application different from the other applications covered in this paper is that, in addition to being free, it rewards the user for using it. For every thousand steps taken, the user will earn one Sweatcoin. When the customer collects enough Sweatcoins, he can spend them on buying products available through the app, donate them, use them to get discounts in partner stores, bid on products offered at the auction, convert them into cryptocurrency or convert them into SWEAT tokens. Although no concrete money is obtained, through earned Sweatcoins, every user can achieve financial profit through shopping. If the application is completely free, and also rewards users, the question arises: How is it possible that it generates any profit at all? The Sweatcoin app is monetized in these four ways: **subscription, cryptocurrency, advertisements** (integrated video advertising messages), partnership (**partner brands**).
To put it simply, the principle of monetization of the Sweatcoin application is as follows: By rewarding users, they stood out from similar applications and increased the number of users, so the consequence was an increase in the number of companies with which they will cooperate. In a sea of free apps, Sweatcoin has gone one step further by paying users.

- **Yplan**

The case of the Yplan application shows that monetization can sometimes be unsuccessful. The Yplan app is designed as an events app based in London. It appeared in 2012 and quickly became one of the most popular ticket booking apps in London. "Already at an early stage, about 30% of iPhone owners in London had the application on their mobile device" (Sawers, 2015). The quick success encouraged the owners to expand - a year later the same application was launched in New York and San Francisco. The application worked on the following principle: you could search for local events by day of event, by type (e.g. film, music, comedy, etc.) or by a combination of day and type of event (Sawers, 2012). The founders had a vision to create a company worth a billion US dollars.
The rapid growth and promising future attracted investors, so Yplan raised about 40 million US dollars. However, already a year later, the initial enthusiasm stopped, new funds did not arrive, and losses began to pile up. In just one year, the application made a loss of about 21 million US dollars. Soon the company was sold for only 2 million US dollars (Sawers, 2016), and its poor performance today serves as a warning to creators of new applications.

Below is a presentation of all the analysed applications with regard to the category to which they belong.

**Chart 3:** Division of applications by category
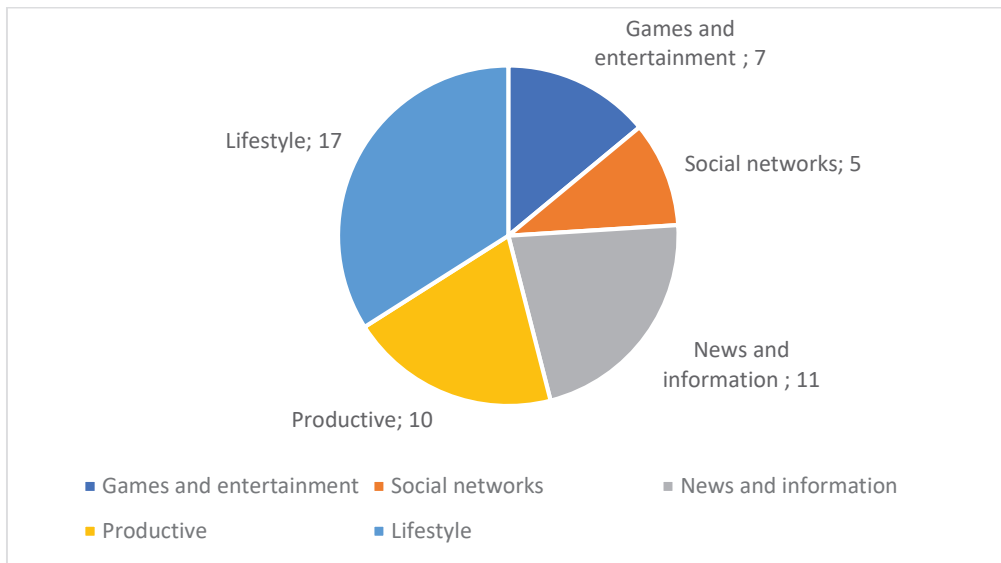
Source: Authors

Out of a total of fifty analysed applications, most of them (17) belong to the category Lifestyle, News and information (11), Productive (10), Games and entertainment (7), and the least (5) to Social networks.

The selected applications differed in the monetization models used, which is shown in the following chart.

Chart 4: Distribution of applications by monetization model
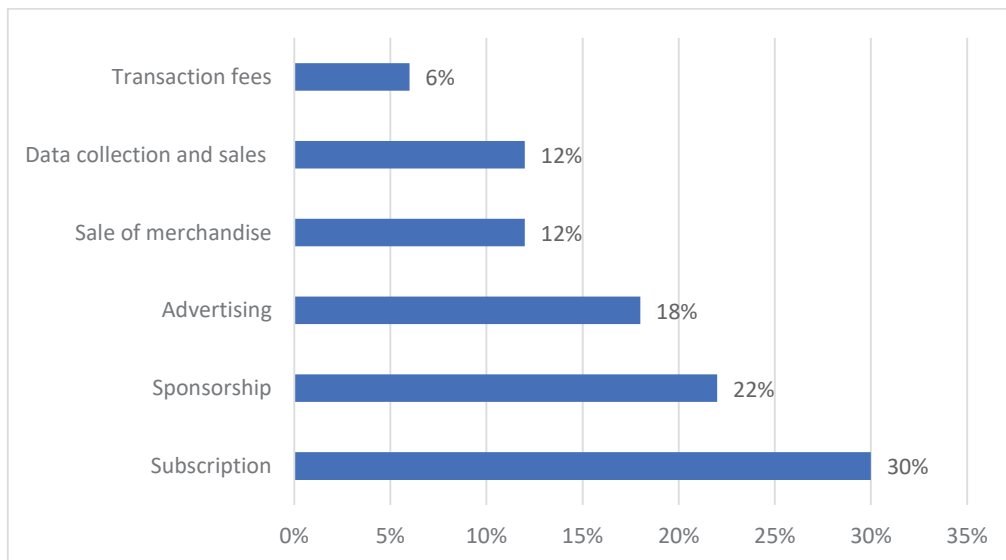
Source: Authors

The graph shows that most applications base their monetization on subscription, then on sponsorship and advertising, and the least rely on data sales and transaction fees.
The surveyed applications also differed in the number of monetization models they use or once used and then discarded, which is shown in the following chart.

Chart 5: Number of used monetization models by application
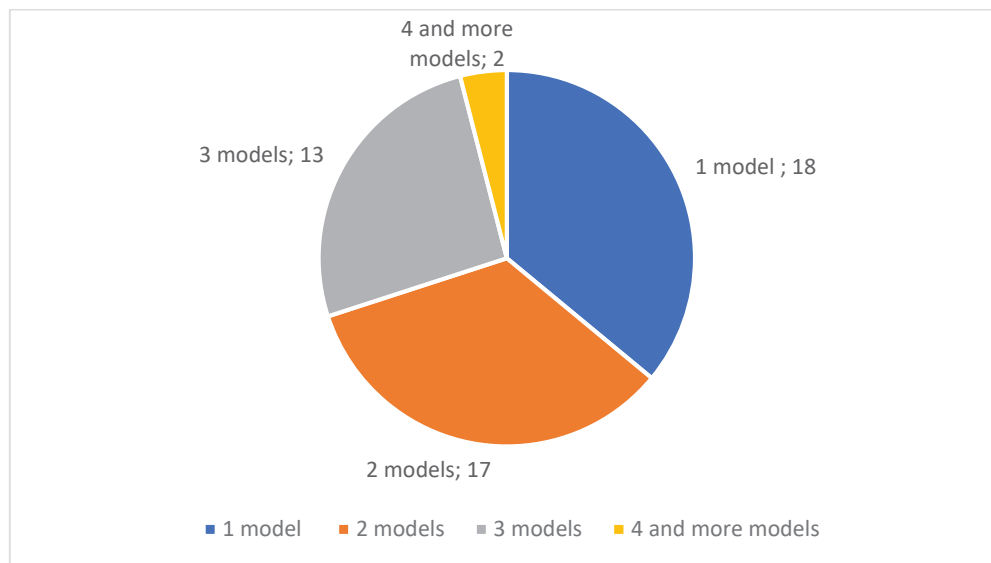
Source: Authors

It is evident from the chart that most applications use one model or a combination of two monetization models for monetization, and only some applications opt for three or more models.

7. Conclusion

App monetization is the process of making the app generate profit. Creating a new app is only the first step in monetizing it. In order for monetization to occur at all, it is necessary to choose an adequate monetization model, and in some cases several of them. Monetization of applications can be done in several ways. The most commonly used are in-app purchases, advertising, subscription and sponsorship programs. Each of these methods has its advantages and disadvantages and it is not possible to determine which of them is the best, because each application has its own special characteristics. It should be noted that not every monetization model is suitable for every stage of the application life cycle.

The research has shown that all application monetization differs from each other and that the monetization itself adapts to the life stage of the individual application. In this paper, 50 very popular applications from the fields of social networks, games and entertainment, lifestyle, news and information, and the creation of new content, services and products have been analysed, and the conclusion is that each monetized application had a different monetization strategy that mainly consisted of using several different monetization models. It has also been shown that a timely change of the monetization model is an important part of the strategy, and many practical examples indicate the possibility of choosing the wrong model, which leads to financial losses. Examples of monetization have shown that many applications that have become the most popular among applications of their kind, have achieved this because of one reason, and that is creativity. Apps like Tinder, Pokemon Go and WhatsApp appeared in an app market where there were already similar apps, but they offered innovative solutions that set them apart from the competition. Users quickly recognized this, which resulted in a rapid growth in their popularity, and thus in generating profits. Anyone who wants to market their app with the goal of monetizing it has a wide variety of strategies and profit-making models at

their disposal. The question of choosing the right model is the key to the success of monetizing any new application.

Through the analysis of various models of monetization at a global level, this study contributes to understanding of advantages and disadvantages of certain forms of monetization that could be applied in the Republic of Croatia. During the research authors have encountered various limitations like the existence of numerous web pages where the best or the most popular applications are ranked. Therefore, the selection of analysed applications may not have been completely unbiased. Taking into account the obtained results, the advantages and disadvantages of diverse models of app monetization this study has opened a possibility for Croatian researchers to deal with the topic in more detail, respecting the global trends on the one hand, and considering the economic and new technology context in the Republic of Croatia on the other.

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