

Czech University of Life Sciences Prague

Faculty of Economics and Management

Department of Information Technologies



Diploma Thesis

**Proposal of a business mobile application for shop-assistants in the
Russian Federation**

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CZECH UNIVERSITY OF LIFE SCIENCES PRAGUE

Faculty of Economics and Management

DIPLOMA THESIS ASSIGNMENT

Iuliia Filatova

Economics and Management

Thesis title

Proposal of a business mobile application for shop assistants in Russian Federation

Objectives of thesis

The main aim of the thesis is to analyse the current market of mobile applications for businesses in Russian Federation.

The partial objectives of the thesis are such as:

- to investigate the main organizational, economic and marketing features of mobile application development;
- to make an overview of the current market of business mobile applications and trends in mobile application development;
- to make a market research for a new business mobile application for shop assistants;
- to evaluate the proposal and formulate conclusions.

Methodology

Methodology of the thesis is based on literature review. The literature review will assist with analysis and proposal of a new application for shop assistants in Russian Federation. The practical part is focused on development of market analysis and business plan for the given application. The proposal will be evaluated from both financial and market perspective by using tools such as SWOT, PESTLE and ROI. The final conclusions will be formulated based on the theoretical knowledge and results of the analysis.

The proposed extent of the thesis

60-80 pages

Keywords

Mobile application, Russian Federation, market research, proposal, SWOT.

Recommended information sources

App Developers in Russia [online] Available at: <https://www.appfutura.com/app-developers/russia>
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Newton, Paul. What is PESTLE Analysis? 1st ed, 26 p. ISBN: 978-87-403-0834-1

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Declaration

I declare that I have worked on my diploma thesis titled “Proposal of a business mobile application for shop-assistants in Russian Federation” by myself and I have used only the sources mentioned at the end of the thesis. As the author of the diploma thesis, I declare that the thesis does not break copyrights of any their person.

Iuliia Filatova

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Proposal of a business mobile application for shop-assistants in the Russian Federation

Abstract

This thesis focuses on analysis the Russian mobile market and proposal of a business mobile application in this country that would be used as a helpful tool for shop-assistants in customer service due to which the shop could increase their sales proceeds.

The market research is based on the official data from the statistical sources (Statista, J'son & Partners Consulting), which helped to evaluated and analyzed the mobile application market and its prospects in Russia. It revealed that the Russian mobile market is young comparing with other countries but it shows the stable dynamics of growth that says about good perspectives for investors. The work of the business mobile application for shop-assistants is based on functions QR-code and augmented reality.

Keywords: business mobile application, market research, shop-assistants, Russian Federation, marketing mix, SWOT, PEST, financial plan.

Návrh podnikové mobilní aplikace pro prodejce v Ruské federaci

Abstraktní

Tato diplomová práce se zaměřuje na analýzu ruského mobilního trhu a návrh podnikové mobilní aplikace v této zemi, který by byl použit jako užitečný nástroj pro prodejce v zákaznickém servisu, díky němuž by obchod mohl zvýšit výnosy z prodeje.

Průzkum trhu vychází z oficiálních údajů ze statistických zdrojů (Statista, J'son & Partners Consulting), které pomohly vyhodnotit a analyzovat trh s mobilními aplikacemi a jejich vyhlídky v Rusku. Ukázalo se, že ruský mobilní trh je mladý ve srovnání s jinými zeměmi, ale ukazuje stabilní dynamiku růstu, která říká o dobrých perspektivách pro investory. Práce podnikové mobilní aplikace pro prodejce je založena na funkcích QR kódu a rozšířené reality.

Klíčová slova: obchodní mobilní aplikace, průzkum trhu, obchodníci, Ruská federace, marketingový mix, SWOT, PEST, finanční plán.

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4 Introduction

In modern conditions it is difficult to imagine the person without mobile phone, the tablet computer, the smart phone or any other portable multimedia device. People have got used that it is always near at hand, and it is not only the means of communication, but this device has also many useful functions, such as calculator, organizer, converter, calendar and many others.

As mobile sales grow around the world, and also there is an increased demand for different mobile applications. Each self-respecting company aims to have, at least, one mobile application and specialized programs by means of which it is possible, for example, to manage databases, or to control a status of the product in the market at any moment.

Development of application in Android, iOS and Windows is a sign that a company is in a trend. It is not always convenient for users to surf in cumbersome websites so it is needed an easy-to-use and available alternative.

In 2016 the market of mobile applications continued growing and developing. Comparing with 2015 the world downloads increased by 15% and spending time in mobile applications grew in 25% so developers gained more than 40% of profit in e-shops Google Play and iOS App Store (New Retail, 2017).

Unfortunately, today there are no specific standard building tools of mobile applications. Each vendor tries to make an operating system in the device unique and memorable to the user, and as a result there are compatibility issues between different applications in different operating systems.

The relevance of the diploma thesis is conditioned by amount of mobile applications' users in Android, iOS and Windows Phone operation systems, the number of which is growing every day. People understand that they get access to unlimited information with the help of smartphone. In this way the market of mobile applications can be estimated as perspective sphere, in which large amount of people work.

This thesis named "Proposal of a business mobile application for shop-assistant in the Russian Federation" focuses on possible development and market analysis of a business mobile application which would help shop-assistants to reduce time on customer service and increase sales in a shop. The author decided to provide unique functions of the proposed mobile application that would be useful for sellers of shops and serve as an educational tool for new shop-assistants.

2 Thesis objective and methodology

2.1 Aims and objectives

The main aim of the diploma thesis is to analyze the current market of mobile application for businesses in the Russian Federation, its perspectives for future and propose useful mobile application for shop-assistants in Russia and make recommendations.

To achieve this aim it is needed to solve the following objectives:

1) to investigate the main organizational, economic and marketing features of mobile application development. This allows scrutinizing the literature relevant to the topic and also defining terms: mobile application, shop-assistant, proposal, SWOT-analysis, PEST-analysis, effectiveness, smart phones and so on;

2) to make an overview of the current market of business mobile applications and trends in mobile application development. Where it is necessary to make statistical analysis of mobile application market in Russia, to analyze functions, platforms and technologies of mobile application and also to make an overview of the current trends in mobile application development in Russia;

3) to make a market research for a new business mobile application for shop assistants; Here it should be made a market research of a new mobile application for shop-assistants, PEST and SWOT analysis's of business mobile application and also evaluated economic effectiveness of creation mobile application;

4) to evaluate the proposal and formulate conclusion. Analyzing the period of development business mobile application, drawing Gantt chart for launching such application and proposing recommendations of a business mobile application for shop-assistants in Russia help to achieve this objective and finally the purpose of the thesis.

2.2 Methodology

The secondary data will be collected from J'son&Partners Consulting Company and Statista which help to make the market research of mobile applications in Russia covering the last 8 years (2009-2016) and to track tendencies and its prospects of development. The author will use economic analysis (horizontal and vertical comparing the same type of data in the units and in the time series) to this overview and forecasting to predict trends in some years. The scope of research will include such indicators as share of paid and free business applications, sales of mobile devices,

average annual growth rate of mobile applications market, demographic characteristics of the business application users' on mobile devices.

And the primary data will be collected by the author. Such data will include a list of shops' categories for which a mobile application can be useful, a list of companies developing business mobile applications in Russia, a list of mobile applications, their descriptions, functions, price and also different operating systems on which these mobile applications are written. Methods of analysis and comparison will be used to find the best platform for writing mobile applications and useful functions in mobile applications for shop-assistants. Also SWOT and PEST analysis will be applied to make an evaluation of proposal of business mobile application perspectives. After that the author will draw Gantt chart for launching a project using GanttProject program in order to show the period of the mobile application's development. Financial analysis will be used for evaluation of the economic effectiveness of the developing mobile application for shop-assistants in the Russian Federation which is based on the Bachelor thesis of Dutova and Smirnova.

Final conclusions will be constructed with a synthesis of theoretical knowledge and practical outcomes.

2.3 Research questions

In the diploma thesis, the following research questions are aroused such as:

- 1) In which way is Russian mobile application market developing?
- 2) How can a mobile application be useful for shop-assistants and owners of brick-and-mortar shops in the Russian market?
- 3) What functions are necessary in mobile applications for shop-assistants?
- 4) What key factors influence development of mobile applications?
- 5) Is it worth to invest in a business mobile application for shop-assistants in the Russian Federation?
- 6) What is the growth of Russian mobile application market?

3 Literature review

In the theoretical part it is scrutinized the literature relevant to a mobile application, determined the definition of a mobile application, conducted the analysis of functions, technologies and platforms of a mobile application, market research of the world mobile applications and made the comparison of the popular mobile applications' stores and platforms. And it is considered the marketing tools which help to examine advantages and disadvantages of the Russian market and the proposed mobile application in order to provide the best solution in developing the project.

3.1 Theoretical issues of mobile applications

More and more people are online via mobile devices. According to data of the International Telecommunication Union (ITU), there are more than 5 billion mobile subscribers (about 80% of world's population) online (ITU, 2017). This new type of Internet access has prompted a huge number of smartphone owners to purchase goods and services through the phone. With the advent of smartphone, multi-functional mobile devices, many features became available to users in addition to the basic function of communication: training, earning money and entertainment. This is made possible by mobile applications.

Mobile applications are the internet applications developed especially for start on smartphone, tablets and other mobile devices. These are the self-sufficient programs used for increase in the existing functionality of the corporate website, presented in the simplified and more user-friendly form (the so-called "website in a pocket") (Business Consult, 2017). Mobile applications help to solve different application-oriented problems: from mobile cartography and reception of e-mail before highly specialized functions. They are called facilitates life of users of mobile devices and also to diversify it.

The features, commitment of a certain OS or ability to pay for mobile applications are characteristics of the mobile applications market of each region.

The market of applications is divided into the following segments:

- content applications,
- business applications,
- mobile games,
- mobile social networks.

There is a row of business models on monetization of mobile applications. Each model has advantages, as well as shortcomings.

Some modern companies have appeared and have won the market exactly thanks to existence of mobile applications. Among them there is the international network of a taxi service called Uber. The vast majority of clients of this company use only a mobile application for the order of the taxi and implementation of payments.

3.1.1 History of mobile applications

The history of mobile applications has begun at the end of the 20th century. Then it submitted mini-versions of games (for example, the “Snake” known for all in phones of Nokia), editors of music for the mobile phone, calculators, calendars, etc. Buyers wanted to receive more interesting functions and games. But producers of mobile phones had neither a motivation, nor resources for development of all those statements which clients wanted to receive. The organization of Internet access became a solution.

But at the beginning this idea has not gained big development in connection with a low covering and speed of the mobile Internet and also its high cost for users. The situation has considerably improved with WAP introduction (the Wireless Applied Protocol), the new standard of data transmission on the Internet. But Small screens of phones have not allowed to use completely websites and to look for information on the Internet (Genadinik, 2014).

At the beginning of the new millennium there was an accelerated evolution of the market of mobile contents. Gradually the quality of batteries considerably improved, and emergence of operating systems for smartphones (the Windows Mobile, Symbian operating system, RIM, Android, iOS) have opened more opportunities for creativity for developers.

The market of mobile phones becomes more fragmented. Penetration on the market of smartphones on the basis of various operating systems varies depending on the region, demographic and cultural features of users. Instead of choosing only one platform, producers of mobile phones and mobile operators were stimulated to sell phones on the basis of various platforms to compete in the markets of the different countries.

Mobile developers need freedom in creation of strong mobile applications without any restrictions. At last, producers of mobile phones need the stable, safe and available platform for support of devices.

Today around the world there are about 20 million software developers. By 2020 their number will have grown to 25 million. Now India, China and Russia show rapid growth of

application developers' number in comparison with the USA which recently was a leader in this index (Business Consult, 2017).

3.1.2 Boom of mobile applications

1. Since 2007 “boom” of mass production and use of Smartphone have begun. It has provoked in literal sense explosion in the sphere of application creation on the basis of mobile technologies. Experts with Wall Street call this phenomenon Economy of Applications (Saldarriaga, 2012).

The boom of mobile applications started in July, 2008 when the Apple Company has presented App Store. Now it has come to the end, Recode writes. In 2016 loadings of 15 top applications have dropped on average by 20 percent in the USA, according to the research Nomura which is based on the data from a tracker of applications of SensorTower (Geu, 2017).

Mobile applications have achieved such wide popularity partly because of the availability. Any owner of the Smartphone without problems will be able to find the necessary application thanks to such platforms as AppStore and Google Play. The huge choice and availability of one pressing on the button shop do such platforms very attractive place. In addition to AppStore and Google Play there are also less popular platforms such as Windows Store, Amazon AppStore and Ovi Shop.

3.1.3 Business mobile applications

Mobile business applications – type of mobile applications which are focused on corporate use (J'son&Partners, 2015).

Mobile business applications have the functionality of use focused on business challenges of the company. These applications often are analogs or additions of the corporate software (CRM, ERP, and communicative OS). They can extend as through app stores (Apple Apps Store, Google Play), and directly in mobile devices of employees from producers. Users of mobile applications are a staff of the company. Applications can extend on the SaaS model or on the module of the Custom SOFTWARE (Churchill, 2016).

Types of business applications

The applications capable to assist the user of the smartphone or tablet in work, study, business development belong to the category “business”, i.e. are understood as business applications a certain type of the utility which simplify various office work: communicative business applications (organization of the working day, management of meetings; projects,

entering of adjustments into documents by means of mobile applications of Adobe Reader, Word, Power Point, Excel, etc.); CRM (systems on management of relationship with clients); ERP (planning of resources of the enterprise); BPM (Control system of projects); Electronic document management system; Business Intelligence system (business of the analyst); Case Management system (administration); Business rules management system (control system of business rules); ECM (management of corporate content); manufacturing execution systems – MES (Churchill, 2016).

Business applications are divided into applications which are available to buyers in app stores, for example, communicative applications or more difficult types: CRM, BI, ERP and also on applications which extend only in the company and which are calculated on achievement of the specific purposes (Genadinik, 2014).

Mobile applications in the market of B2C look for ways how to attract and entertain the missing audience. For these people the main thing – emotions and new feelings therefore mobile applications are directed to satisfy of exacting taste.

For the market of B2B and its business it will be important to audience to obtain relevant and significant information, than something amusing. The business audience has no time, first of all it likes and appreciates convenience; therefore the main effort when developing a mobile application has to be directed to creation of decisions which will make life of these people better, quicker and more simply (Churchill, 2016).

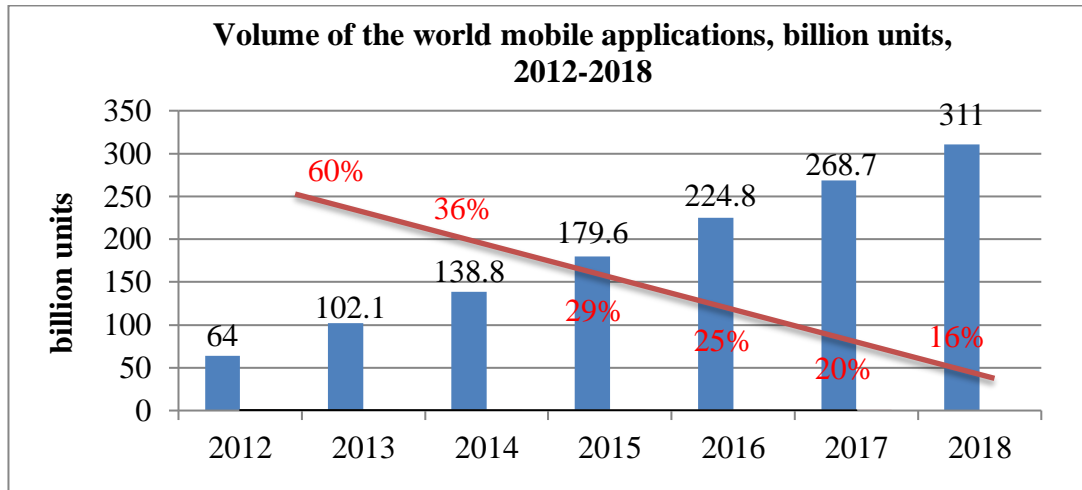
3.1.4 Analysis of the world mobile application market

The market of mobile applications shows growth in all macro regions. It should be noted that prompt growth rates – the size of the market of mobile applications in the world has increased by 25 times during 2009-2012 – are caused by the expansive nature of the market (Miroshnichenko, 2017).

The market of mobile applications shows one of the highest growth rates for the market of intellectual products. The market is attractive to investors in spite of the fact that the main companies of this branch have already rather strengthened the positions in the market of mobile applications, and only such large players as Microsoft are able to afford to enter infrastructure of this market (J'son&Partners, 2015).

In the Figure 1 it is presented the volume of the world mobile application in billion units and percentage of growth dynamics from 2012-2018.

Figure 1 – Volume of the world mobile applications, bln units, 2012-2018



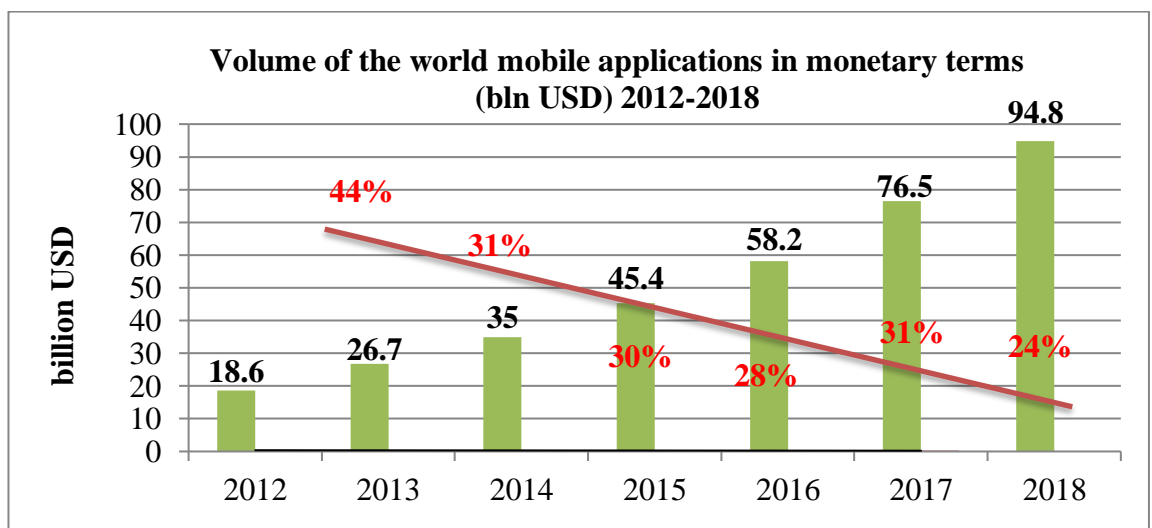
Source: J'son & Partners Consulting, own processing

The author predicts growth of size of the mobile applications market together with development of roar of mobile technologies in 2017-2018 by 268.7 and 311 bln. units that will make 20% and 16 % of the growth dynamics.

In Figure 2 it is presented the volume of the world mobile applications in monetary terms and percentage of dynamics growth from 2012-2018.

From 2012-2016 the revenue of the world mobile applications was 58.2 bln. USD, that made 28% of dynamics growth. For 2017-2018 the author has made forecasting so the volume of the world mobile applications will grow by 76.5 and 94.8 bln USD that dynamics growth will be on 31% and 24% more than the previous year (Figure 2).

Figure 2 – Volume of the world mobile applications in monetary terms (bln. USD), 2012-2018



Source: J'son & Partners Consulting, own processing

To show the explosive growth of the market and scales of its influence, it is worth reminding about the mobile game Angry Birds which could achieve huge coverage of audience

and has created the full-fledged media brand comparable to film industry brands, having created initially a brand on mobile phones.

Following the results of 2016, the number of downloads of mobile applications has grown by 15% in comparison with 2015. At the same time, users began to spend for 25% more time in applications. Such growth of popularity has brought to publishers 40% more income in comparison with last year (New Retail, 2017).

In the world market of mobile applications it is possible to note development of the countries, earlier being outsiders of the market: India, Indonesia, Brazil and Mexico. In 2016, China has come out on top income in shops of mobile applications. Last year it was marked by a large number of global transactions in which also leaders of the market participated.

The most part of revenues of shops of mobile applications still fall on games. The second direction which actively developed is shopping. Time spent by users in the application of this type has grown in a year by 30%, first of all, at the expense of the USA. Thanks to development of Internet networks and penetration of the Internet the popularity of applications of stream video has considerably increased; here growth incomes was observed both due to increase in number of users, and due to their involvement.

As of 2015, the share of the mobile Internet was about 58% of traffic of all RuNet (Liveinternet, 2015). This indicator constantly grows that is connected with relative depreciation of mobile devices and also with depreciation of the mobile Internet.

As for the market of mobile devices (smartphone, tablets, etc.), according to J'son & Partners (2015), the sales volume of mobile phones and smartphone in the first quarter 2016 has decreased by 2% in comparison with the first quarter 2015 12% comparing with the first quarter 2014. J'son & Partners (2015), firstly explain such fall with saturation of the market of smartphone. However, it is not the only reason: negative economic factors of which it was talked above also have very great influence on the market. In particular, consumers became more rare to update the outdated phones and smartphone (J'son&Partners, 2015).

At the same time, however, in the general structure of the market of mobile phones and smartphone, the share of the last in 2016 has grown by 2% that is connected with the increasing transition of the population to multi-function printers. Nevertheless, the share of smartphone in the total amount of the market in Russia is still lower, than in the developed countries: 70% in Russia against 78% on average in the world.

3.1.5 Basic drivers in Russian market

In the course of planning, development, introduction and advance on the mobile application market it is necessary to consider such factor as the market driver. These are the reformative factors influencing a condition of the market upon its transition from one state to another (Gerasimov, 2014). In other words, the driver of the market is the reason of change of its state.

Increase in number of customers

In the market of mobile development in 2015, there was a transition from the market of the offer to the market of demand. Many customers began to pay attention to a mobile segment, as to a segment of mass communication.

Growth of mobile consumption

Sales of smartphone, tablets grow, the consumed mobile traffic grows.

Growth of mobile advertising

Budgets of mobile advertising naturally grow with the growth of quantity of mobile applications and their competition for the user.

Stimulation of this market comes from the owners of platforms Google, Apple and Microsoft, and creation of more favorable conditions of cooperation that stimulate developers on the local markets by holding competitions. The purpose of owners of platforms is the maximum quantity of applications for the platform and receiving more concrete service for user (Silaeva, 2014).

Growth of the market is provided by such factors as the growing number of mobile devices, fast development of networks 4G and the general shift of consumer and communication habits towards mobility (for example, mobile shopping, development of mobile bank service and mobile payment service providers, the growing popularity of location-based services, distribution of mobile social networks and mobile messengers).

3.1.6 Choice of mobile application format

It is obvious that the first what it is worth thinking of, the purpose for the sake of which the mobile system is created for interaction with clients and range of tasks which are planned to be solved with its help. Both the architecture of mobile system, its functionality, emergence of a mobile application, and approaches to ensuring information security and many other things will strongly depend on the choice of the purposes and tasks.

It is also necessary to define precisely a target audience for whom the mobile system is created. Without all features hardly mobile system will give that effect on which its corporate clients have counted.

Of course, determination of the mobile system's purpose for work with clients and its audience is a prerogative of corporate clients. Most likely, departments of marketing, sales, service support or the departments which are responsible for loyalty of clients can act as them. (McGrane, 2012).

3.1.7 Market research in the Internet

In case of collecting primary information on target audience Internet polls act as the main methods of data collection. The most widespread method of their carrying out is questioning. The questionnaire represents a set of questions on which answers of respondents, that is the persons selected for questioning have to be received. Because this tool differs in big flexibility and universality, it is the most widespread means of collecting primary data (Mariampolski, 2001).

Depending on priorities of business customers, the level of study of various aspects of mobile system for certain will be various. However, the number of questions will hardly manage to be bypassed completely.

Being engaged in such serious business as development of mobile applications, also to have to consider the fact of prevalence of these or those operating systems on the basis of which they work.

The technical embodiment of the idea begins after detection of the major tasks. There are several technologies of application creation, each of which differs in the operation speed, adaptation under a certain platform, etc. The popularity of the platform causes also its choice. In this case all works can be performed in a short time, having picked up experts not only for creation, but also for service. The same factor defines also convenience of use, clearness, simplicity and also periodicity of updates of the platform. The design, speed of operation and interaction with other OS of mobile devices add the general requirements.

3.1.8 Review of the current mobile platforms

Today creation of mobile applications became one of the most profitable types of business (Business Consult, 2017). The reason for that is simple: mobile devices are becoming more and more popular and people spend the majority of their time in the Internet. As a result, a large amount of entrepreneurs has to move their business in online and to develop absolutely new for them platform. Three firms – Apple, Google and Microsoft – are three “legislators of a mode” as in a pattern of mobile devices as in a pattern of applications (Genadinik, 2014).

In this regard creation of mobile applications which will be able successfully to work under Windows is well documented and does not present special difficulties. Many tablet computers and smartphone use this popular operating system. The principal advantage of such applications is their universality. Application for the mobile device is normal or it is launched also on normal computers and notebooks, or has the “high” version for not sensor devices. The principal minus of such applications is rather poor performance recognized even by the company Microsoft from the point of view of a graphics and a sound.

The iOS operating system is one of the closed “ecosystems” which thought as self-sufficient and completely independent of any external sources (Pelet, 2017).

For a long time it is marked that creation of mobile applications under Android became one of the means for all who wished to declare itself as soon as possible in the market of mobile devices and applications for them. Android devices are spread quite widely: under them tablets and smartphone from the most different vendors, and both the largest world companies and small firms which sell the production in separately the taken countries work. The principal advantage of such applications is a speed and universality. The regular updates appearing for Android OS do possible use all of new technologies. At the same time their instability is considered the principal minus of such applications. Unfortunately, at the moment few applications for Android are free of bugs and “security loop holes” in a security arrangement (Burnette, 2015).

Considering the current trends and analyzing the modern IT market, production of different vendors, it is possible to tell with confidence that the most smartphones are constructed on the Android operating system (HTC Sensation, the well-known Samsung Galaxy S, Sony Ericsson Xperia, Motorola Droid). Unlike iPhone and Windows Phone, it has the open code owing to what it can be set on different phone models (Samsung Galaxy S, HTC Sensation, Sony EricssonXperia, and Motorola Droid). The principal advantage of phones and tablets on the basis of Android is an opportunity to install a set of applications of both information, and entertaining character (Pelet, 2017).

The Android Market is today the high-loaded Internet resource on which applications for phones and tablets on the basis of Android are provided. The Android Market resource is one of those which are used most often. All tools are divided on separate subjects that it was simpler to person to orient in production diversity.

There are several methods to create an application on Android. It can be developed from scratch; it is possible to order an application from studio or to create one by, using ready designs. The first two methods are time and means demanding whereas the third assumes existence of special software (Burnette, 2015). AppGlobal is engaged in distribution of it (Silaeva, 2014). Responses of their clients demonstrate that the company offers licenses to the special designer who

allows facilitating and accelerating significantly development process of application for business. Thanks to platform opportunities, everyone can open own business devoted to application creation.

Success of a mobile application is in demand for those, or other services. Today creation of mobile E-commerce shops will be the most logical step. It is simpler and more convenient to the user as for search of necessary goods. And it means that the number of clients and sales will be instantaneous increased (Geu, 2015).

In general, it is necessary to tell that, despite an economic situation in the country, the market of mobile development continues to grow. It is worth marking that the kernel of the leading developer companies was already created – they actively work at the market since 2008 and already have a wide range of successfully realized projects in a portfolio. In addition to “custom” development in the market there are separate companies which are focused on an own product: services of a/b-testing, analytics, automated exchanges of a traffic purchase.

3.1.9 Android & iOS comparison

For choosing the operating system it is necessary to analyze advantages and disadvantages of Android and iOS platforms which take the majority of the mobile operating system market as in the world as in Russia (Table 1).

In the table 1 it is presented the mobile operating market share both in worldwide and in Russia in 2018 (Table 1).

Table 1 – Mobile operating system market share, 2018

OS	Worldwide share	Russian share
Android	74.39%	67.83%
iOS	19.64%	29.64%
Unknown	3.03%	0.55%
Windows	0.61%	1.21%
Series 40	0.50%	0.20%
Samsung	0.35%	0.18%

Source: Statcounter, (2018), own computation

As it is shown in the table 1, Android is the platform, most widespread in the world (74.39%) for smartphones now, and for the Russian Federation it is not an exception (67.83%), and is used by many different mobile phone manufacturers. The share of iOS is also one of the leading operating systems in worldwide (19.64%) and Russia (29.64%), but it cannot be compared with Android. Such small percentage can be described that iOS is used only on devices of Apple, such as iPhone. As for others operating systems, they do not enjoy such high popularity among people because there are a small amount of products with these OS (Table 1).

There are varieties of objective and subjective characteristics which can be used for comparison mobile operating systems. However, in general the fundamental essential differences iOS from Android can be presented in following features.

1. Interface

Android has more benefit as the icons and widgets can be installed quicker and easily. In iOS all widgets are in the special menu (settings) that is less convenient than in Android.

2. Multitask

Both operating systems have large amount of applications. But Android has opportunity for more multitasks; it is possible to manage different applications as at the desktops (Burnette, 2015). While iOS closes the previous application opening ones, that renders the negative effect on functionality of the system.

3. Personalization and customization

This works enough well in both operating systems. However, the specialized firmware is more stable in iOS than in Android.

4. Virus

iOS is absolutely closed system, hard moving modifications so do not have viruses. While viruses in Android is common situation which is easily solved by setting up protective software checking all applets during installation (Noah, 2017).

5. Settings

At devices with Android OS it is used standard settings for connections which simplify communication with other devices. iOS is used only company switching interfaces and buying different others can be expensive (Noah, 2017).

6. Support of the most different formats

Most of users were disappointed in mobile production of Apple only because of a row of the restrictions introduced by the company. Android gives an opportunity for supporting a large number of formats that, certainly, will play a big role in increase an army of admirers of this operating system (Burnette, 2015).

7. Personal data storage

Storage of the majority of personal data can be organized on the Internet that will save users from frequent synchronization of the mobile device with the computer. It, in turn, can be useful in case of loss of the device or local data from it.

8. Charging system

Regardless of that how it is good hardware in a device, the smartphone or other device with OS Android is necessary to recharge quite often. It is connected with the fact that the system does not save on the hardware resources provided to it. Partially the shortcoming can be corrected by

energy saving control, shutdown of unnecessary functions, but only partially (Burnette, 2015). While iOS guarantees a long time of autonomous work even at the high level of load of the device.

Despite all the shortcomings, the Android operating system was and will be demanded in the market of mobile devices. The wide range of devices under management the Android covers all price segments – both the budgetary models, and a premium class, allowing practically everyone to get the device with an operating system from Google.

Proceeding from the listed comparison of the Android and iOS platforms, it is possible to draw a conclusion that the most optimum platform for development of a mobile application in the ratio the price/efficiency is Android.

3.1.10 The main players of mobile applications market

It is possible to carry to the main players of the mobile applications market:

So-called mobile first of the company for which the mobile application is a business model basis: sale of tickets, delivery of food, booking of hotels and tickets and so on; here it is also possible to carry games and some paid or conditionally free applications

Representatives of electronic trading: for whom the mobile application is an additional sales channel; considering growth of mobile traffic and it's falling on stationary devices, use of mobile applications perspective (Appfutura, 2016).

Traditional business for which mobile applications can be used mostly as a loyalty program component; an application task in this case – to inform on novelties, news, to receive feedback, that is to become, in fact, a direct communication channel.

3.1.11 Trends in developing mobile applications

1) The augmented and virtual reality (AR/VR) will continue development

Emergence of Pokemon Go stimulated interest in AR and VR technologies. VR devices are constantly improved too: Samsung Gear VR, Google Cardboard and Oculus Rift.

According to the research Statista (2016), AR/VR technologies have quite high potential; the industry will reach a value of \$80 billion a year (\$35 billion software and \$45 billion hardware) by 2025 (Richter, 2016).

Unfortunately, the majority of applications with the augmented/virtual reality do not bring special benefit to people and money to customers/developers yet. The technology and ways of its application have not found each other yet.

Most likely, in the future AR and VR will actively develop and there will be a lot more new projects. Integration of an interactive into the image in the nearest future can cardinaly change approach to communication (Tchernogorov, 2016). But it is required some time that businessmen have learned to earn and bring real benefit.

2) The machine learning will be applied in business

In the last year it was a growth of popularity of entertaining applications with use of neural networks: MSQRD, Prisma, Mlvch, Fabby, FindFace. Recently Google has released the experimental game “Quick, Draw!” which has shown possibilities of neural network and has stirred interest in use of technology. However, the capacity of this sphere is much more and more important, than just cheerful applications for processing of a photo and video (Merzlikin, 2011).

But it is important to note that use of technology assumes constant research and improvement of an algorithm. It means uncertainty on terms and cost of development to which it is necessary to be ready if machine learning is introduced in the projects.

3) Payment in mobile applications will become simpler

Google Wallet and Pay Apple have given a good impetus in development of mobile commerce.

According to forecasts of Business Insider, by 2020 sales by means of the systems of mobile payments will make 266 billion dollars (Business Insider, 2016).

All advanced online stores will update the applications soon, having added features for Pay Apple and Google Wallet that will lead to increase in sales.

4) Micro-applications will continue to go the own way

It is seen a trend of division of large multipurpose services into narrowly targeted solutions of one task not the first year. For example: Foursquare and Swarm, Facebook and Messenger. Instagram released the whole pack of applications for editing a photo and video: Hyperlapse, Layout, and Boomerang. VK tested live-broadcastings on the website and recently long ago instead of introducing in the current application, started separate – VK Live (Ovechkin, 2016).

5) The companies will optimize internal processes by means of applications

During the last few years big corporations began to use mobile applications not only as the additional channel of sales/increase in loyalty, but also as a way of optimization or automation of internal processes. Applications for couriers, logisticians, merchandisers, HR managers, heads and others – all this has already existed. In the future developments for internal needs will become even more.

According to a research of Adobe, (from more than 1500 respondents of the companies) 77% of business owners see prospects in corporate applications and 56% are going to increase investments into them next year.

6) IoT-technologies will be introduced everywhere

Researchers of Gartner have published the report of Hype Cycle 2016 (Gartner, 2016) which shows a cycle of a maturity of technologies and shows that “the Internet of things” in the expiring year was only in anticipation of the peak of the popularity.

And though analysts continue to argue on whether the state and society is ready to universal use of the attached devices, the largest companies stake on “the Internet of things”.

In 2016 Rostelecom took the lead of development of the sphere, the leading mobile operators promise implementation of the high speed 5G-Internet that it was easier for machines to interact with each other, and Apple actively advances HomeKit on the presentations (Tchernogorov, 2016).

It is obvious that mobile applications become the central interface for interaction of the person with any “smart” systems. They are necessary for monitoring, the analysis and observation.

3.1.12 Implementation of mobile applications for shop-assistants in M.Video stores

The seller with the tablet is not news any more. Technosila one of the first has armed consultants with such devices. After it M.Video has announced “mobilization” of sellers. In the summer 2017, the company has reported about the project of transferring the consultants to mobile devices. The project has been realized in partnership with Microsoft which has helped to provide more than 5 000 sellers in 200 shops across all Russia with tablets on Windows 10 for mobile sales and consultation of buyers.

On each mobile device the special application integrated with all IT systems of the retailer including the loyalty program is installed. It means that now sellers can at the shelf with the equipment directly identify the client, help with the choice, visually compare several models, specify the goods rest in a warehouse, find necessary color or design, to pick up accessories and services, online compare the price with conditions of competitors and to make the most favorable cost proposal taking into account all operating actions and bonus points of the client.

The application also allows to compare online the prices at competitors and to offer clients the most favorable purchase by means of the Guarantee of the Best Price program.

According to reports of M.Video, the pilot project in 30 shops has proved efficiency of mobile technologies – on average sales have grown to 5%, in some points the difference has reached two-digit indicators, the number of regular customers in these shops has increased by 30% (Sysoykina, 2017).

The company expects to pay back 70 million rubles (costs of the equipment, software development and training of sellers) invested in the project within the first year of introduction.

Similar decisions are created by the developers companies for various segments of retail.

3.1.13 Instruments of subscribers monitoring for mobile application

Among instruments of subscribers monitoring for mobile applications it is possible to select the following.

1.YouScan

YouScan is the first and leading system for professional monitoring of Russian-speaking social media. YouScan traces references of your brands, products, competitors in blogs, forums, social networks (Facebook, VKontakte), Twitter and even in YouTube, and represents results of monitoring in the convenient analytical interface with functions of team operation (Varakin, 2012).

2.BuzzLook

BuzzLook is a Russian-speaking service of social media monitoring of: Facebook, VKontakte, Livejournal, Flickr, YouTube and Twitter. This system of social media monitoring allows: to watch reputation of your brand; to study activity of competitors in network; to answer questions of your clients in their environment (social networks); to collect offers from your clients; to support your on-line community; to work with objections in network; to investigate the markets; it is better to advance your product (Hayden, 2014).

3. Google Analytics

Google Analytics allows analyzing influence of mobile technologies on your business. If you develop mobile applications, you can use SDK for iOS and Android to obtain data on their use.

4. Yandex. Metrics

The counter is also installed in an application code, but it is visible, i.e. not only the one who has access to the account can check summary records, but also the ordinary visitor. For this purpose it is necessary to click the located icon on the page. Reports have broad coverage of indicators (visits, returns, the number of unique users, etc.) (Varakin, 2012).

Thus, thanks to these systems it is possible to reveal a number of shortcomings of functioning and implementation of the application, including discrepancy of a mobile application to the purposes of services promotion.

3.1.14 Software development lifecycle of mobile application: methods and stages for development

The organization of mobile application development is one of administrative tasks, received the standard name Project Management, represents art of the management and coordination of human and material resources throughout life cycle of the project by application of modern methods and technology of management for achievement of the results on structure and amount of works, cost, time, quality and satisfaction of participants of the project defined in the project (Jeffrey, 2016).

For success of the project it is necessary to make the project plan, to carry out its analysis regarding feasibility in the existing conditions and to control results of the plan implementation in each stage. In the project plan it is fixed works, necessary time, and result at each stage and the required resources. For an illustration of the project plan prepare the network schedule (the sequence of works) of the project and the resource histogram (the need for various resources in each time point).

Management of a mobile application project has some features. Mobile applications have small size in view comparing with “desktop” and web applications. Management has small budget and the small term of development (strict requirements to terms, it is impossible to be late even per day). The project often is not documented. The analysis of requirements, design and coding of prototypes are often carried out at the same time, and often earlier, than the contract with the customer has appeared. The customer can seldom formulate requirements or refers on the rival application. Requirements can be changed in the course of development. It is usual if one manager operates 2-4 projects at the same time. And in general, the project is more risky (Churchill, 2016).

Features of applications: the device has the mass of sensors from which events can unexpectedly influence work of the program; there is a mass of devices’ models and versions of OS, testing on many models is necessary or to list in the contract which models are supported (Churchill, 2016).

In this regard it is necessary to adjust fast and easy process of management requirements, frequent (at least once a week) coordination of the current project with the customer, to organize a code in such way that it would be possible to change, trace versions of a code easily.

The flexible methodology of the software development is focused on use of iterative approach at which the software product is created gradually, the small steps including realization of a certain set of requirements. At the same time it is supposed that requirements can change. The teams using flexible methodologies are formed of universal developers who carry out various tasks in the course of creation of the software product (Thakur, 2016).

When using flexible methodologies minimization of risks is carried out by the data of development to a series of the short cycles called by iterations lasting 2 – 3 weeks. Iteration represents a set of the tasks planned for performance during a certain period of time. It is created

the efficient option of a program system in which the most priority requirements of the customer are implemented. All tasks necessary for creation of the efficient software are carried out: planning, analysis of requirements, design, coding, testing and documenting. Though separate iteration is, as a rule, insufficient for release of the new version of a product, it is meant that the current software product is ready to release at the end of each cycle. Upon termination the team carries out reevaluation of requirements' priorities to the software product and introduces amendments in system development.

Agile is the combined option of iterative and spiral models of life cycle: step-by-step development and existence of ready fragments working OS, taken from iterative model + the predominating roles of a human factor and the analysis of possible risks are taken from spiral model (Corral, 2013).

Agile allows adapting processes to unstable needs of the mobile area. Agile provides flexibility for understanding of the market, structuring a product and its release in short terms.

The whole family of methodologies is based on these principles:

- Extreme programming
- Scrum
- Lean Software Development
- Test Driven Development
- Feature Driven Development, etc (Corral, 2013).

Scrum and XP are more demanded in the developing of the mobile application.

Scrum is one of agile-techniques in which creation of a product happens in the form of a series of iterations of the fixed duration. The technique places emphasis on high-quality control of process of development, on management of tasks in a command development environment. Every time when a new feature or updating is completed, testing is carried out (Corral, 2013). Thanks to testing during development, possible bugs are fixed in time that as a result leads to much stable product. As a result, it is created the decision most of which precisely conforms to requirements of the customer and is demanded by the market.

The Agile-technique of XP (Extreme Programming) is focused on the engineering party of development of a product. It is system approach to programming. While Scrum pays more attention to management and release, XP is concentrated on production process. XP includes the practicing significantly improving quality of the final product (Corral, 2013).

These methodologies are most popular today. The main credo of Agile can be formulated as “Flexibility, communication and result”. This methodology adheres to the following principles. People and interaction is more important than processes and tools. The working program is more important than exhaustive documentation. Cooperation with the customer is more important than

formal arrangements of the contract. Readiness for changes is more important than following to the initial plan (Churchill, 2016).

Restrictions of Agile methodology:

- fixed Price projects. It is impossible to estimate adequately the project if late collecting requirements is declared;
- the projects of software development performing critical works. The standardized templates and processes are important for such projects as they allow to create OS in advance stipulated qualities;
- projects in absolutely new area. Without knowing specifics of subject domain at all, it is necessary to begin the project with the deep analysis, collecting requirements, prototyping, fixations of architecture, etc. It contradicts the principles of Agile methodology;
- the projects of the big size and complexity having the long term of development and deployment (Half, 2017).

Agile is so widespread because the majority of projects satisfy these restrictions.

It is considered key stages of a mobile application creation.

1) Drawing up a technical task

The specification or the technical documentation is stipulating a set of requirements to system and approved both by the customer/user, and the performer/producer of system. Such specification may also contain system requirements and requirements to testing.

2) A design of UI/UX

User Experience Design includes various UX components: information architecture, interaction design, graphic design and content. At this stage all works which have been described in the specification are implemented. The graphic card of interaction between screens is created (Thakur, 2016). The design is created on the basis of client's wishes and is aimed at target audience. The design of 1-3 pages which lays all foundation of the application is initially studied.

3) Development

Experts from a static state transfer the application to interactive model. It can be achieved by means of imposition. The finished option of work goes to the client in order to estimate a result of work and express the opinion (Inukollu, 2014).

Completion occupies about a half of all time which has been spent earlier. It is necessary to tell that editing the application is inevitable. In the course of its creation it is impossible to predict all possible defects which can arise at the time of the application using.

4) Testing

At different stages of application development internal testing is mandatory both on simulators, and on real devices. The testing purpose – to be convinced that interaction of

application with the hardware and software platform of smartphones and tablets will be such as it was supposed at a prototyping stage (AIM Consulting, 2014).

5) Creation of the prerelease version

The working application version should be received in a result of tests series and completions of application. This version should also be added to app store: Apple App Store, Google Play, and app store of Windows Phone (depending on for what platform development is carried) or any similar service for distribution of applications (Shaun, 2016).

3.1.15 Comparison of Google play& Appstore

Appstore and Google Play markets appeared in 2008. Google Play (the previous name Android Market) – app store from the Google company and allows owners of devices with Android operating system to install and buy different applications. Appstore – app store for devices with iOS from the Apple company.

On Google Play and Appstore it is possible to find applications on the following subjects: business, widgets, live wall-paper, health and sport, tools, books and reference books, comics, medicine, music and audio, multimedia and video, news and magazines, lifestyle, transport, finance, photo, education, weather, purchases, travel, work, entertainments, communication, social, sport.

In 2017 variety of applications at Google Play were 3.5 mln USD, but in AppStore – 2.2 mln USD. According to the Table 1, the Google Play has 70% more amount of downloads, than App Store. At the same time App Store is 70% more profitable than Google Play (Table 2). Over 90% of application revenue is driven by free applications (money is made through in-app purchases, advertising and premium features).

Table 2 – Google Play & Appstore in numbers 2017

Name of category	Google Play	Appstore
Number of available apps	3.5mln USD	2.2mln USD
Number of downloads	75 billion units	25 billion units
Average app price	3.34 \$ USD	1.46 \$USD
Annual revenue	21 billions USD	40 billion USD
Fee	Only once \$25 USD	\$99/year
Share of free/ paid apps	93.99% 6.01%	87.72% 12.28%
Popular category of apps	Games – 10.62%	Games – 25.02%

Source: Statista (2017a) (2017b), own computation

To distribute applications, developers have to pay a one-time \$25 registration for a Google Play Developer Console Account, while for Appstore – \$99 per year. However, average price for an application at Google Play is expensively on \$1.88 than at Appstore. So the share of paid application is bigger at Appstore (12.28%). The average price of the application in the category Business is \$8.04 for iPad and \$3.62 for iPhone. While the average cost of applications is \$3.29 and \$1.86 respectively. Thus, developers of business applications count on solvent audience as in app stores the average price of applications of the category Business – one of the highest among the prices of other categories' applications.

It is considered that Apple itself is guilty of similar combination of circumstances. The company has too strict requirements to developers and to start the application in Google Play eventually becomes much more simply and quicker. It is possible to draw a conclusion that Apple is more anxious with quality of applications, than their quantity. It is connected first of all with the fact that Google places big emphasis on developing countries which are on the first places by the number of inhabitants (China, India, and Indonesia). Exactly thanks to the number of citizens of these countries it was also succeeded to achieve such result. Apple, the turn, is considered the company not for the poor therefore also the prices in App Store are higher, and buy there more often because can just afford it.

The same concerns also developers. It is the most favorable to write the program under iOS, Apple pays developers much more to increase quality not only the products, but also services.

3.2 Theoretical issues of market analysis

3.2.1 Market research

The research of the market is one of the directions of marketing researches. The research of the market assumes clarification of its state and tendencies of development that can help to reveal shortcomings of the current situation in the market and to prompt opportunities and ways of its improvement (Kotler, 2014). Without the data acquired during the researches it is impossible to make, analyze and compare correctly information necessary for decision-making connected with activity in the market: sharing of sales, the market choice, forecasting and planning of market activity.

When carrying out market research, methods of data collection can be classified on 2 groups: quantitative and qualitative.

Quantitative research is usually identified with holding various polls based on using the structured questions of the closed type which the larger number of respondents answers.

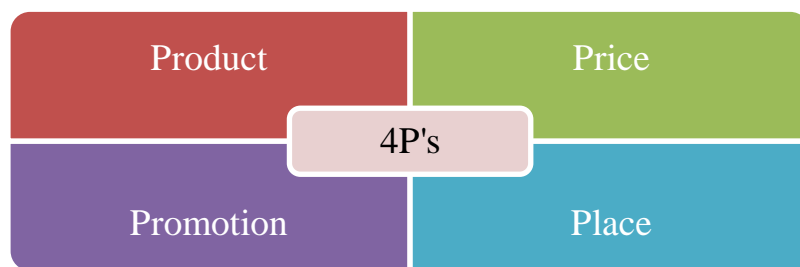
Characteristics of such method are: accurately certain format of the collected data and sources of their receiving, processing of collected data is carried out by means of ordered procedures (Gerasimov, 2014).

Qualitative research includes collecting the analysis and interpretation given by observation of what people do and tell. Observation and conclusion have qualitative character and are carried out in not standardized form (Mariampolski, (2001). This method will be used in the practical part of the author.

3.2.2 Marketing Mix

Marketing mix is a basic element of any business strategy. The model is simple and universal in use, and represents a certain check sheet for productive development of a company product in the market.

Picture 1 – Graphical representation of marketing mix



Source: powerbranding.ru

The forefather of 4P's model was Jerry McCarthy who introduced the concept of tactical tools mix and presented the findings of James Culliton and Neil Borden. Initially the marketing mix included only 4 basic elements: product, price, place of sale and advance of goods. Such marketing mix is called basic model 4P's: product, price, place and promotion. Subsequently this model became complicated and has as a result passed into a complex of marketing 5P's and 7P's (Holden, 2017).

3.2.2.1 Product

The product represents what the company offers the market and the consumer. Both physical goods and services can be a product. The successful product is always under construction on understanding and satisfaction of important requirements of the target market.

The product is either notable or intangible service which, apparently, satisfies specific need or demand of clients. All products correspond to logical life cycle of a product. It is a key to understanding of those problems which the product tries to solve. The advantages offered by a

product and all its functions have to be understood, and it is necessary to study unique selling proposition of a product. Besides, potential buyers of a product have to be identified and understood (Chernev, 2014).

3.2.2.2 Price

The price is an important element of marketing mix; it is responsible for final profit on sale of goods. The price is defined on the basis of the perceived goods value by the consumer, prime costs of a product, and the prices of competitors and desirable rate of return. The price covers the actual sum which the user has to pay for a product (Holden, 2017). The product price directly influences sales. It is connected with the fact that the perceived cost of a product depends on the client, but not on objective accounting of the offered product. If the product is estimated above or below its perceived value, it will not be on sale. If there is a positive consumer value, then the product can be successfully estimated above its objective monetary cost. To the contrary, if the product matters a little in the opinion of the consumer, then for its sale underestimation can be required. Plans of distribution, costs of a chain value added and a margin and how competitors estimate the competing product can also influence the price (Chernev, 2014).

3.2.2.3 Place

The place of sale provides availability of a product to the target market and means that the goods of the company have to be present at the market at the right place and in the right time. Distribution is a key element of placement. The strategy of placement will help to estimate what channel most is suitable for a product. How the user gets access to a product, it also has to supplement other strategy of a product.

For physical goods distribution channels can be the following: hypermarkets, supermarkets, grocery stores at the house, the markets, specialized shops; wholesale sellers or retail dealers; electronic commerce; direct sales or network marketing; sales according to the catalog, etc (Holden, 2017).

3.2.2.4 Promotion

Marketing communication strategy and methods are under advance headings. They can include advertizing, advertizing campaigns, special offers and public relations. Irrespective of the used channel, it has to be suitable for a product, the price and the end user whom it addresses

(Holden, 2017). It is important to distinguish marketing and promotion. Promotion is only communication aspect of all marketing function.

3.2.3 Situational analysis

Situation analysis is called assessment of probable changes in the company work, taking into account influence of external conditions which are not controlled by the management of the organization. It is an extensive research of the company work from the production point of view and commerce and also external factors in a concrete time interval. This type of the analysis allows estimating changes in the market, to describe results of firm activity and to develop the correct strategy on the future (Clarke, 2017).

Using of such analysis helps the company to respond quickly on market changes, increase in level of the competition, dynamics of the prices, and decline in quality of production or deterioration in other criteria of production.

Basis of a method is the concrete situation, but not dynamics of certain factors from the outside or in the enterprise. In other words, it is a complex of the circumstances exerting now impact on the company. Applying such way, the administration of firm is capable to create several strategies, depending on market development, due to what reaction to any changes will be adequate, and company management in different circumstances will bring positive results (Clarke, 2017).

Situation analysis is carried out both for creation of new strategic receptions, and for improvement of what there is already. Such analysis needs to be made constantly authentically to know the level of competitiveness of firm, to have an idea of resources and threats of competitors and also to estimate all categories of consumers. So, data on all market subjects are analyzed by the specified way: manufacturers, suppliers, clients, production.

3.2.3.1 PEST

PEST analysis is a simple and convenient method for the analysis of a external environment of the enterprise. The technique of PEST analysis is often used for assessment of key market tendencies of branch, and results of PEST analysis can be used for definition of the list of threats and opportunities by drawing up SWOT analysis of the company. PEST analysis is the instrument of long-term strategic planning and is formed for 3-5 years ahead, with annual updating of data (Newton, 2013).

PEST analysis is an abbreviation of the following indicators of branch: political (P), economic (E), socio-cultural (S) and technological (T).

Political

Political – factors of a political and legal environment of the company. In the analysis of the politician – a legal environment of branch, the market or the country it is recommended to answer questions of rather key changes in area of political stability and legal regulation.

Government regulations and legal factors are assessed in terms of their ability to affect the business environment and trade markets. The main issues addressed in this section include political stability, tax guidelines, trade regulations, safety regulations, and employment laws (PESTLE analysis, 2013).

Economical

Economical – factors of an economic condition of the market. Through this factor, businesses examine the economic issues that are bound to have an impact on the company. During the analysis of this group of factors it is necessary to determine 6 key parameters characterizing state of the country economy or the market on which the company functions: dynamics of economy development, change of exchange rates and capital costs, change of unemployment rate, change of the inflation rate, change of the located income per capita, tendencies in the business cycle followed in the country.

Socio - cultural

Socio-cultural – factors of a social and cultural condition of the market. With the social factor, a business can analyze the socio-economic environment of its market via elements like customer demographics, cultural limitations, lifestyle attitude, and education. With these, a business can understand how consumer needs are shaped and what brings them to the market for a purchase. During the analysis of this group of factors it is necessary to describe 5 key parameters: change of a demographic state, level of the population education, features of mentality, change of social groups of the population, change of tastes and preferences of audience, the settled myths and prejudices (Newton, 2013).

Technological

Technological – the factors characterizing technological progress in branch. How technology can either positively or negatively impact the introduction of a product or service into a marketplace is assessed here. These factors include technological advancements, lifecycle of technologies, the role of the Internet, and the spending on technology research by the government (PESTLE Analysis, 2013).

During the analysis of technology factors it is necessary to pay attention to 4 parameters: possible changes in the key technologies used in the market (innovations in the equipment,

materials, in business models and methods of business), influence the Internet and mobile technologies on market development, innovations in the information technologies allowing competing more effectively in the market.

3.2.3.2 SWOT

SWOT analysis is one of the most effective tools in a strategic management. The essence SWOT analysis consists in the analysis of internal and external factors of the company, assessment of risks and competitiveness of goods in branch (Probert, 2015).

Advantages of SWOT analysis are that it allows rather simply, in the correct section to look at position of the company, goods or service in branch and therefore is the most popular tool in risk management and adoption of administrative decisions.

The action plan with the indication of terms of performance, priority of performance and necessary resources on realization is result of carrying out SWOT analysis.

Strengths

Strengths of goods or service – such internal characteristics of the company which provide competitive advantage in the market or more advantageous position in comparison with competitors, in other words those areas in which the goods of the company feel better and more steadily than competitors.

Value of strengths for the company in strategic planning: due to strengths the company can increase sales level, profits and a share in the market; strengths provide the advantageous provision of goods or service in comparison with competitors. Strengths need to be strengthened, improved, and used constantly in communication with the consumer of the market (Hill, 2014).

Weaknesses

Weaknesses or shortcomings of goods, service are such internal characteristics of the company which complicate business growth prevent goods to be in the lead on road, are noncompetitive in the market (Probert, 2015).

Value of weaknesses for the company in strategic planning: weaknesses of the company hamper the growth of sales and profit, pull the company back. Due to weaknesses the company can lose a market share in a long-term outlook and lose competitiveness. It is necessary to trace areas in which the company isn't rather strong, to improve them, to develop special programs for minimization of risks of influence of weaknesses on efficiency of the company.

Opportunities

Possibilities of the company are favorable factors of the external environment which can influence business growth in the future. Value of opportunities of the market for the company in

strategic planning: possibilities of the market represent business growth sources. An opportunity needs to analyze, estimate and develop the plan of measures on their use with attraction of strengths of the company.

Threats

Threats of the company – and lead negative factors of the external environment which can be weaken competitiveness of the company in the market in the future to decrease in sales and losses of the market share. Value of market threats for the company in strategic planning: threats mean possible risks of the company in the future (Hill, 2014). Each threat has to be estimated from the point of view of probability of emergence in the short-term period, from the point of view of possible losses for the company. Against each threat solutions for their minimization have to be proposed.

3.2.4 Market segmentation

Market segmentation – the strategy of producers and sellers of goods consisting in division of the market into separate parts (segments) on the basis of a type of the sold products, a territorial arrangement, and type of the buyers who are the most presented on this part of the market on social features. The strategy of market segmentation is directed to finding for the same product the uniform groups of consumers possessing some general characteristics which can be used for carrying out specific trade policy (Struhl, 2013).

Market segment – allocation of the consumers, products or the enterprises groups with general characteristics. Any uniform method of the market segmentation does not exist. Segmentation of the market on groups of buyers assumes that for each of segments separate goods and marketing complexes can be required.

3.2.4.1 Target marketing approaches

The strategy of target marketing means development of separate marketing actions for each segment of the market, studying of different target groups' needs and formation of a special offer for each target market, using various advertising messages and ways of products' promotion in each segment.

Using the strategy of target marketing, the company concentrates all the resources and efforts on certain quantity of segments, chooses such target audience which has specific needs, and tries to satisfy the requirements of the consumers, establishing higher price for it (Kotler, 2014).

There are several target marketing approaches.

Undifferentiated targeting

The company using the undifferentiated targeting generally accepts philosophy of the mass market. It considers the market as one large market without separate segments. The company uses one marketing mix for all market. The company assumes that individual clients have similar needs which can be satisfied with the general marketing world (Struhl, 2013).

Concentrated targeting

The concentrated targeting means narrow specialization of the company on the one concrete segment of a branch. Such segment usually has significant differences in consumption and purchase commission model than other segments.

Using the strategy of concentrated targeting allows the company to reach competitive advantage in branch due to development of the product which is most meeting needs of the main audience and to reach the high level of loyalty. The high loyalty protects from switching to competitors. Concentration efforts on one segment allow reaching high competitiveness of a product at the low budget for promotion and rather small costs of support and distribution of products (Hill, 2014).

Multi-segment targeting

The company following the multi-segment targeting serves two or more accurately certain segments and develops a separate marketing mix for each of them. Separate brands are developed for service of each segment (Struhl, 2013).

It is the most demanded target marketing approach as it is capable to generate sales volume, higher profit, a big share of the market and savings at the expense of scale in production and marketing. But this strategy includes higher design of a product, production, promotion, inventory, market researches and costs of management.

4 Analytical part

The analytical part of this thesis is based on practical knowledge gained from literature review and qualitative method market research, which was conducted by the author of this thesis. Some chapters make use of external studies as well. The aim of the analytical part is to interpret the results of market analysis and give answers to the research questions which show the situation in the Russian mobile market and describe the need of the proposed application. The partial aim is to propose a business mobile application for shop-assistants named “ScanSell”, describe its principle, functions, purpose and create a financial plan of the economic effectiveness of the application’s development.

4.1 Market overview of mobile application in the Russian market

The Russian mobile market is rather young, with a set of undeveloped segments. At the same time it shows stable dynamics of growth which is maintained by rapid distribution of the mobile Internet. Thus, for the developer there are many opportunities to occupy a profitable niche.

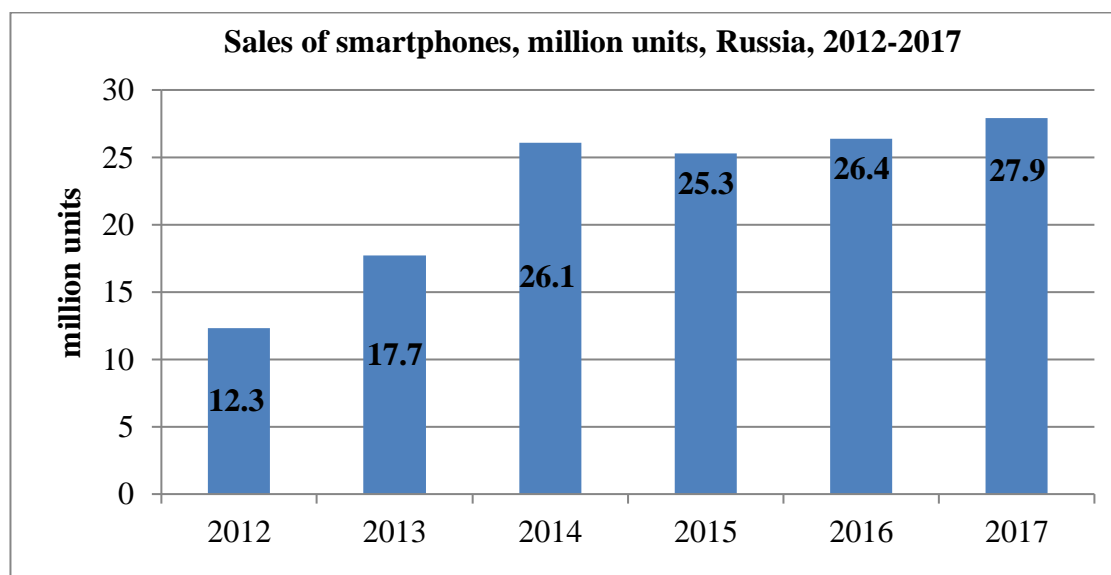
The market of mobile applications in the Russian Federation is in an origin stage now. It is possible to take for an example the western business model where very many travel companies have own program with the prices and the list of tours adapted for work on iOS or Android smartphone. The Statistics Portal shows that in 2017 Android has become a leader of the Russian smartphone mobile operating system market, with 69.85% of market share and its popularity steadily grows. Prospects of iOS in Russia are quite doubtful (26.48%), in particular because of the solution of Apple to increase iPhone cost in rubles by 70% in December, 2014. Windows Phone could not occupy a significant share of the market with 1.85% (Statistics, 2018).

On January 13, 2016 MTS and Euroset have reported about the first in the history of the Russian market of smartphone drop in sales. Revenue at the same time grows thanks to increase in prices for devices. In 2015 in Russia 25.3 million smartphones have been sold that is 8.4% less, than the previous year (Figure 3).

By estimates of J’son & Partners Consulting, total sales of smartphone in Russia in 2015 have made 25.3 million devices. And for the first time since 2009 they have shown negative dynamics: concerning results of 2014 smartphone sales were reduced by 3% (Figure 3).

Excessive demand for expensive electronics, including smartphones, in 2014 has been caused by devaluation of ruble.

Figure 3 – Sales of smartphones in Russia, mln units, 2012-2017



Source: J'son & Partners Consulting, MTS, own processing

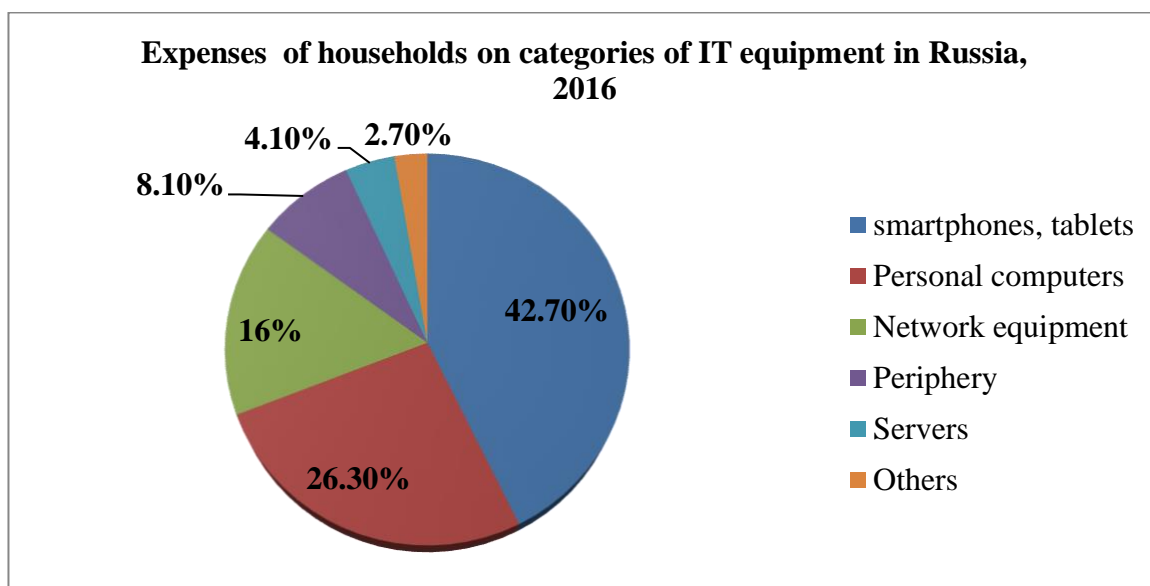
It is connected with the fact, that drop in oil prices, economic sanctions and the ruble depreciation, which has followed all this, have led to a price hike in shops. At the same time the main blow was incurred by sellers of digital and household appliances and also clothes, footwear and accessories which range almost completely consists of import production. However, retailers have quickly enough reacted to current situation and began to reconsider the price and assortment policy, trying to achieve decrease in expenses and to look for more flexible approaches to work with suppliers. The increase in sales of smartphones from 2012-2017 has an influence on the growth of mobile application in Russia, according to J'son&Partners company. As for 2017 according to MTS research (MTS, 2017), sales increased on 5.5% and made 27.9 mln units of smartphones in Russia (Figure 3). The main driver of the market growth in 2017 analysts of MTS called purchases of devices by installments and the credit which also promoted increase in the average price of the smartphone up to 13.6 thousand rubles (MTS, 2017).

Nearly 40% of visits are the share of mobile devices.

At the Figure 4 it is presented the expenses of households on categories of IT equipment in Russia for 2016 year (Figure 4). The categories include: smartphones and tablets, personal computers, network equipment, periphery, servers and other goods.

In Russia, as well as around the world, consumers more and more prefer to buy mobile devices (42.7%), than the personal computer (26.3%). Periphery and servers take not so high place among other categories and make approximately 4 and 8 percent of all expenses in IT equipments (Figure 4).

Figure 4 – Expenses of households on categories of IT equipment in Russia, 2016



Source: IDC, own computation

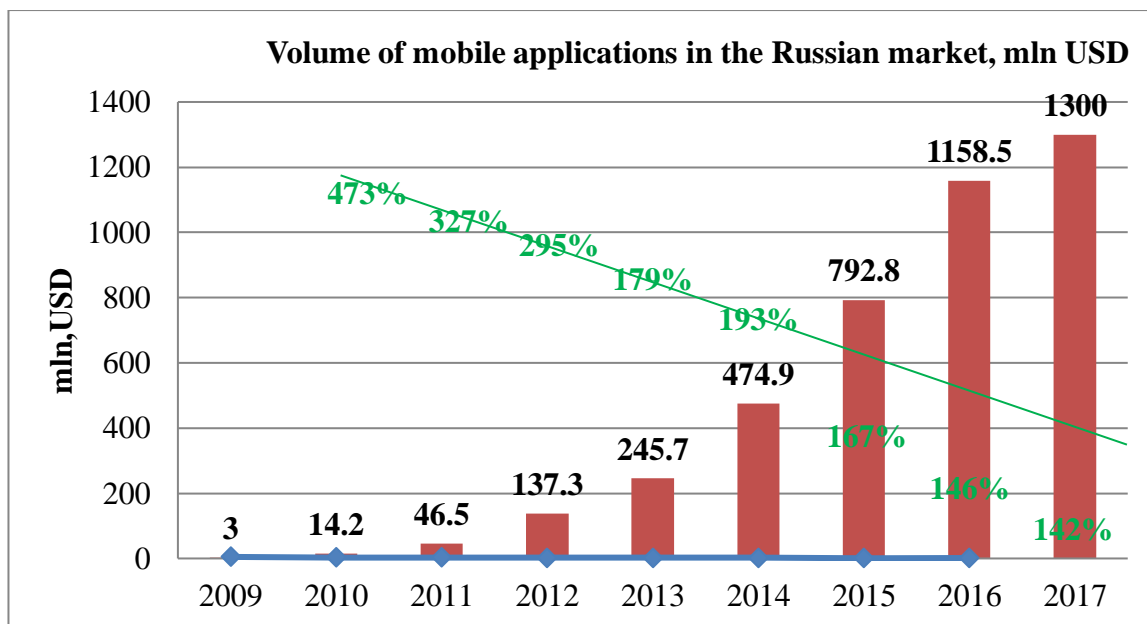
Sales of the personal computer in Russia are reduced the last two years while sales of smartphones steadily grow from the moment of emergence of these devices in the market (Maslenikov, 2017). Reduction of price and improvement of their functionality became the factors stimulating changes in the user preferences towards mobile devices. As well as around the world, rapid growth of number of new applications and services for mobile devices has played a big role in change of behavior of consumers in Russia. Availability of inexpensive broadband communication in the largest cities of the country was also of great importance. Distribution of mobile devices in the corporate environment goes not so impressive rates so far. Safety issues and rather small development of the environment of corporate mobile applications are the main reasons that sales of smartphones and tablets to business customers make extremely small share from total sales of these devices.

At the beginning of 2016 a number of smartphone producers have announced new increase in prices for production in Russia for 15-20%. According to J'son & Partners Consulting, in connection with continuation of growth devices cost and decrease in purchasing power of a tendency 2015, namely maintaining great demand on the budgetary smartphone, will take place. The size of the smartphone market will strongly depend on a further macroeconomic situation in the country and ruble exchange rate.

From the point of view of the offer, the market of mobile applications is strongly segmented on large developers who receive about 80% of all orders so they are strongly overloaded, and the small companies which receive a small share of orders.

According to the data J'son & Partners Consulting, for 2012 the market of mobile applications in a pattern made \$7.83 billion. And to 2016 it made \$65.79 billion (J'son&Partners, 2017).

Figure 5 – Volume of mobile applications in the Russian market, mln USD



Source: J'son & Partners Consulting, own processing

In the Figure 5 it is shown the volume of mobile applications in the Russian market and growth dynamics in percentages from 2009-2017. Also it is presented a forecast for 2017.

By 2017 the author predicted that volume of the mobile applications market in Russia will reach \$1300 million, having increased on 142% in comparison with 2016 (Figure 5).

So it is also showed the tendency of increasing mobile application in Russia, in spite that fact that mobile application is very young market. It will also grow in the future.

Growth of the Russian mobile applications market is provided by the following factors:

- the growing number of mobile devices,
- fast development of networks 4G,
- the general shift of consumer,
- communication habits towards mobility
- (for example, mobile shopping, development of mobile bank service and mobile payment service providers, the growing popularity of location-based services, distribution of mobile social networks and mobile messengers).

Among drivers of the mobile applications market' growth it is possible to select the following: increase in influence of mobile social networks, appearance of the new mobile Windows platform 8, growth of penetration of tablet computers, development of mobile payment service providers and mobile banking, reduction in cost of communication via mobile devices,

penetration of LTE and its positive influence on the market of mobile applications, electronic commerce as the driver of growth of mobile consuming.

Among barriers of growth of the mobile applications market the author marks the following: complexity of payment for emerging markets and small awareness of users on opportunities of mobile applications.

At the moment the mobile system of Russia is exposed to strong changes in result of recently entered principle of technological neutrality. It has allowed the bigger number of players to enter on the market of mobile telecommunications which has been monopolized earlier by operators' monopolists.

As a result of the growing competition the quality of services improves, and the prices fall gradually. Moreover, mobile operators are obliged to provide a covering in settlements with the number of the population of 1000 and more people to receive and keep the licenses. According to a recent research of eMarketer (2017), the level of mobile communication distribution, which was 80% in 2014, has grown by 6% in 2017 and the number of users of the mobile Internet in Russia has increased from 61.5 million in 2014 to 88.1 million in 2017 (eMarketer, 2017).

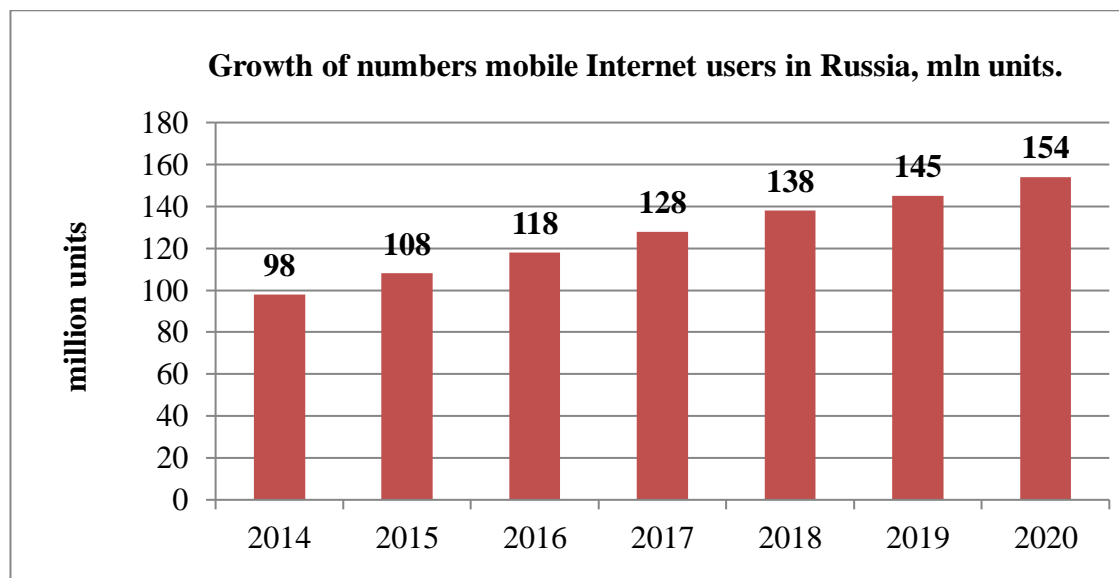
In Russia the rate of a gain of Internet users is only 2%. On the one hand, it is natural: as almost everyone has the access to the Internet whom fiber-optical communication lines have reached. On the other hand, even in the USA where its penetration seems even to more universal, the gain has made 4%. It is possible explained what audiences in Russia have still not reached the Internet are elderly people. At the same time if in the West pensioners – active audience, they travel much and buy, act as target audience of marketing campaigns – to take the American advertizing of the same iPhone 7 with participation of the pensioner. But in Russia pensioners cannot allow themselves such entertainments with pension in 10-15 thousand rubles.

Besides, statistically, five years ago the percent of users the Internet via mobile devices did not exceed 10%, and for the end of 2015 the share of users of mobile devices in the Internet has exceeded for 65% (Statistics, 2015). The general gain in a year makes 5%. Not so long ago the research which reports approve that fact that already in the nearest future and if to be exact, then by 2020 has been conducted, the covering of the mobile Internet will cover 90% of all globe (eMarketer, 2017). The notable jump of popularity of the mobile Internet, of course, can be connected with portability of devices for connection and development of mobile types of networks.

According to the same statistics, in process of growth of the mobile Internet also the number of various smartphones for which this Internet is under construction will grow. If to trust researches, then the number of smartphones will grow exactly by 50%. Partly it is connected with essential increase in availability of smartphones to most of the population.

By forecasting of the author, in 2018 the number of active subscribers of the mobile Internet (SIM cards) will reach 138 million that is 30% more in comparison with 2015. Besides, in the next three years traffic of access to the mobile Internet from mobile devices will grow by 2.6 times. At the same time the cost of mobile Internet will be constantly fall (Figure 6).

Figure 6 – Growth of numbers mobile Internet users in Russia, mln units



Source: Google, J'son&Partners, eMarketer, own processing

Certainly, the developed economic situation in the country has not avoided also the market of mobile developments. Many companies which are engaged in application creation have replaced activity, having begun to develop the software for the order. Startups, unfortunately, do not sustain the competition. Except financial problems, in Russia the shortage of points of access to the wireless Internet and weak level of its signal is still sharply felt. And if this problem is not so relevant for the large cities, then for the periphery (towns) remains very topical. While the Internet from mobile operators still continues to remain expensive.

Only those companies which considered development of a mobile application as an image step and did not plan to earn on mobility began to reduce budgets by a segment of the mobile applications, or did not understand how to make it. Other companies, on the contrary, have addressed remote channels of customer service and mobile enterprise-solutions.

It is possible to allocate two types of obstacles to growth of the mobile applications market in Russian – tactical and strategic. The general decrease in financing on various aspects of the companies' activity belongs to tactical. To strategic – absence at the business which is not connected with IT or the information sphere and also understanding why in general mobile applications are necessary and which benefit it is possible to derive from them. From a performer's of view, the factor interfering growth is the acute shortage of qualified personnel which is only

aggravated with the lack of fundamental training of such experts by higher educational institutions in the Russian Federation.

The gain of the general Internet audience in Russia for the last year has been provided, mainly, due to active growth of the mobile Internet. So, in a year the share of the exclusive mobile users who are not going on-line from desktop computers and laptops in Russia has grown by 90%. In general, among the Russians living both in the large cities, and in small villages, the number of people, using the Internet from mobile, makes 50 million. It is curious that for 10% of the population of the country in general, (14% of Internet users in the country; 11.8 million people), the mobile Internet is the only point of access to worldwide network. This allows drawing a conclusion about the prospect of entering the market of mobile devices and call into question expediency of applications programming for personal computers.

4.2 Market segmentation – target audience

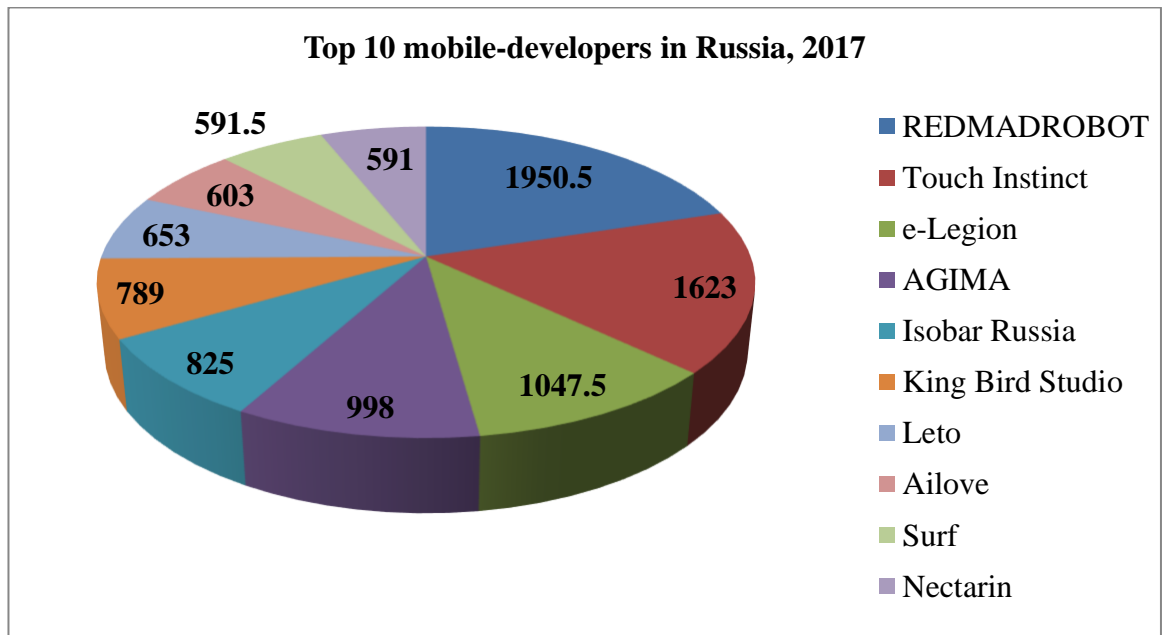
Now in App Store, Google Play Market and Windows Store shops it is most of all presented applications for entertainments: social networks, games, messengers, etc. While business applications are not enough. Their share in 2012 made about 3% of all size of the market of mobile applications, and by 2016 this indicator has grown absolutely slightly and reached 5.4% (J'son&Partners Consulting, 2015). Though here, really, is where to be developed. Society feels the need for applications of socially important spheres, such as medicine, education, power engineering specialist, housing and public utilities.

According to the author's research, at the moment there are not enough applications which would be integrated into business processes as an ecosystem element, but not as additional instruments of marketing and communications. It speaks about various tools, automation, assemblies of statistical data, mobile terminals for field staff, etc.

Today there are a lot of studios of mobile development in Russia. About 200 participate only in the rating of Ruward (Figure 7) (Ruward, 2017). Most studios of this rating are engaged not in pure mobile application development, but also in web application development, branding and advance, that is they are versatile which fosters the competition.

Moreover, there are also agencies which are concentrated on mobile decisions there are studios which develop mobile game applications (they as a rule work for themselves). Experience shows that it is rather heavy to be engaged in purely mobile development, thus versatile teams can win. They have more chances to attract and hold the client, and respectively and to earn. Narrow specialization in mobile development is a really difficult occupation (Figure 7).

Figure 7 – Top 10 mobile-developers in Russia, (points) 2017



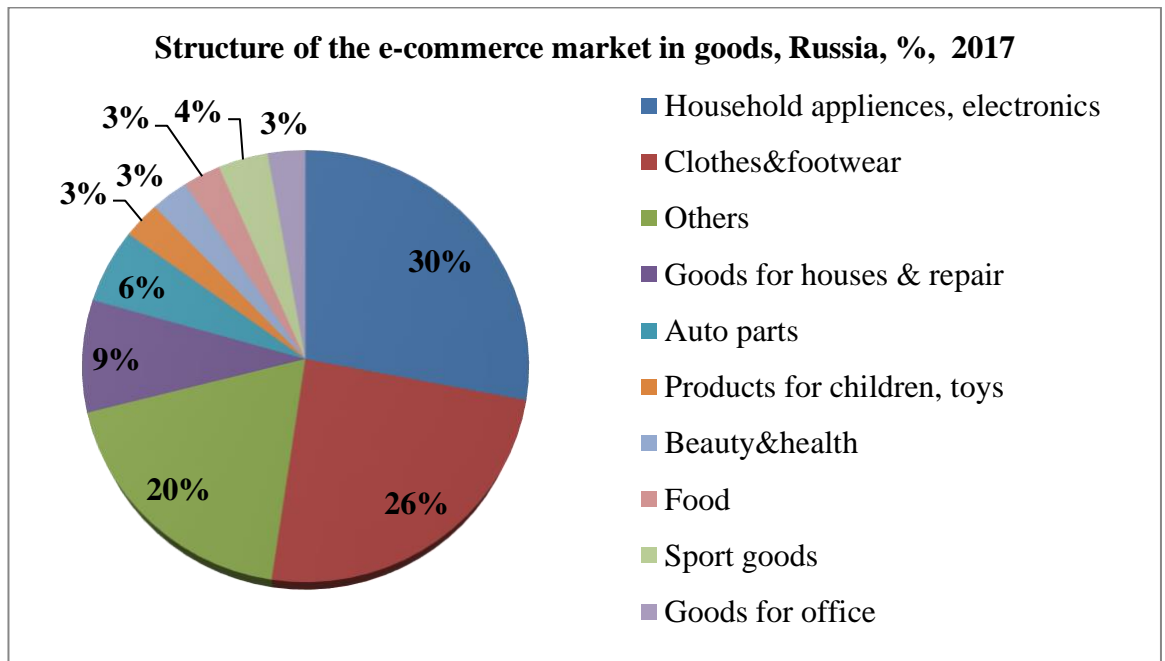
Source: (Ruward, 2017), own computation

At Figure 7 it is illustrated top 10 mobile-developers in Russia. The research was made by Ruward in 2017 in which were used filters as branches of a business and cities. The research showed the rating of the companies which were engaged in development, design, support and development of mobile applications. The rating serves as the reliable instrument of the choice of the optimum contractor on applications programming on various platforms (iOS, Android, Windows Phone, native formats and so forth) for a great number of customers in Russia and abroad. So the best result got the company REDMADROBOT (1950.5 points) which has been in the IT industry since 2008 when Apple App Store appeared in the market (Figure 7).

For the last a year and a half in Russia leaders of branch were recorded – it is the first step of a maturity of the market. The segment of mobile business development in Russia, as well as around the world, is in active growth, but so far concedes in a maturity to the technological leader of the USA and some European countries.

Thanks to increase of the numbers Internet users and the mobile Internet in the country, increases also electronic commerce which helps shops to sell more products. However, statistically more 50% of Russians do not make purchase online (Data Insight, 2017). Moreover, as it is seen in the figure 8 the percentage of purchased goods in online shops remains insignificant (Figure 8). In the figure 8 it is presented the research of Data Insight (2017) “Structure of the e-commerce market in goods in Russia”. This are based on continuous monitoring of number of orders in large and average online stores. They are verified with data on attendance of online stores and also the statistical data submitted on the website of shops.

Figure 8 – Structure of the e-commerce market in goods, Russia, %, 2017



Source: (Data Insight, 2017), own computation

Thus, the demand on goods in stores will remain unchanged among population in Russia, since despite development of online trade, more than 90% of purchases in a segment of household appliances and electronics, furniture, the sports equipment, building materials come to the end in shops – costumers come personally to communicate with the consultant and to look at goods in real time.

Despite high penetration of the Internet into the Russian Federation, increases in level of technological literacy, financial culture (use of non-cash means of payment), the most important problem of the Russian Internet trade is the mistrust to online stores and to quality offered production. It is connected, first of all with the fact that the risk of acquisition of illegal goods in the Russian Federation is rather high. In this regard in the near future traditional sales outlets will continue to enjoy great confidence of consumers. Considering this, the proposed mobile application will be the best offer for shops as it will simplify the work of shop-assistants.

4.3 Marketing Mix

Marketing by means of mobile applications represents a new, but high-growth communication channels which, in comparison with other channels, such as Internet, TV, outdoor advertising, and significantly cheaper today. At the same time mobile marketing has already reached that point of development after which it can freely compete with any other channel by the main criterion – audience volume.

Besides, the mobile audience is characterized as objectively advanced, certainly formed, technically developed and bright. To reach it – means to visit personal space of users. Because devices, than the mobile phone are closer, at modern people is not present. The last is the price obviously incommensurable to coverage of audience.

There are two main reasons for development of own business in the direction of the market of mobile applications.

First, already today from the shops offering applications and games more than one million developments have been redeemed. That is there is an opportunity to place a product or service on the AppStore, Android Market and Windows Marketplace resources. At the same time, people who have been interested in goods or were satisfied with quality of the rendered service also will recommend it to others.

The second reason is that application programming for mobile devices is a step forward in development and advancement for a firm. Moreover, if people are pleasant to the program, they will pay attention and to other services and products in an arsenal of the company. Plus to it is popularity. Making advertizing to a mobile application, further, it already in itself will become best of all to tell about activity of firm.

Today it is not important any more whether creating the application for Android or other platform, – users want available content for which it is not necessary to be spent. If the companies is important the attention of consumers, it is worth conceiving how to create the application free.

4.3.1 Product

The author of the thesis decided to call the proposed business mobile application for shop-assistants “ScanSell”. The name is easy to remember as it combines two words in itself that perfect describes the work and purpose of the mobile application. So “Scan” is because of using QR-codes and augmented reality for showing a product in the real view. “Sell” is for targeting on the shop-assistants which will use the application for quick selling of a shop’s products. “ScanSell” is aimed to simplify the work of shop-assistants and increase profit of a shop. So shop-assistants will be able to offer the same technologies and level of personalization to which buyers have already got used online. It is important that by means of a mobile application shop-assistants will not just help consumers with the choice, but and will make the most favorable proposal, clearly demonstrating all conditions of purchase. As a result, shops with mobile consultants will show higher sales in comparison with comparable usual shops.

Sales of types of goods will become more effective. If earlier the buyer had an opportunity to study only that range which has been laid out on the shelf then by means of the developed mobile

application any range of goods will be possible to show in the electronic catalog of goods on the tablet.

Such approach to sales will simplify interaction of a shop-assistant with consumers. The shop-assistant should not drive the costumers from shelves with goods to a stationary workplace any more. All information – selection of goods, comparison of similar models, verification of goods in a warehouse, responses, characteristics, photo, video, 3D model, colors, integration with shop, documentation, delivery period – will become available with this mobile application “ScanSell” here and now. The consumer together with the shop-assistant can compare the price of goods with the prices of competitors. In addition, the following features will be also possible: branding of price tags and information on goods; integration of the application with online store; access to statistics of use of the application by clients; the control system of the remains in a warehouse and other functions.

The mobile application “ScanSell” allows: providing optimum number of sellers and cashiers – in general on the hall; motivating the seller to render high-quality service; providing the consultant with all necessary information on goods, stock balance, etc., and, irrespective of department and category of goods; providing to the consultant all available information on preferences of the buyer. So such abilities of the proposed mobile application are able to reduce the shortcoming of shops that help not to lose consumers.

Also “ScanSell” can serve as an educational tool for new shop-assistants providing all necessary information about a shop and its products.

4.3.2 Price

As this proposed mobile application “ScanSell” is for private use of shops so it will undoubtedly be paid mobile application. The price for development of such application makes 644,774.59 rubles as it is calculated in 4.6.3. But the price of the mobile application for shops should be compared with the similar applications.

The competitor to this mobile application is a mobilization shop-assistants’ program of M.Video shops which is based on IT infrastructure on Windows 10 which is not a mobile application but only the operating system which is completely integrated with platforms of the retailer. This competitor has the similar functions but not all range of them as this mobile application “ScanSell”. The shortcomings of the competitor is that it does not use augmented reality, QR-codes, video and 3D model of the products, which allow showing products in real time; it has just pictures of the goods in color palette and their descriptions (Sysoykina, 2017), (Microsoft, 2017), (M.Video, 2018). In the mobile application “ScanSell” these shortcomings are

eliminated. As a result, this is the huge benefit of the proposed mobile application among the others business mobile applications in the market. So the price will differ for variety of functions (Table 3).

Table 3 – Price and functions of the mobile application

	Small	Medium	Enterprise
Subscription cost in a month	5000 rub.	15000 rub.	Contractual
Description of products' features	+	+	+
Gallery of images	+	+	+
Goods 3D model	+	+	+
Generation of price tags on a template with markers augmented reality in the PDF format for printouts in printing house (CMYK) or on the printer	+	+	+
The name and logo of the company on price tags and markers of augmented reality, opportunity loadings of own template		+	+
Change of the color scheme of buttons, pages descriptions of goods		+	+
3D – logo of the company when loading model of goods and a logo output on pages of goods description		+	+
Click to the external web page of goods from application		+	+
Viewing of a 3D model of goods with various coloring and materials		+	+
The distributed coalition loyalty program			+
Connection of your web service for display additional information			+
Video	+	+	+
Display existence and the remains of goods in shop in real time		+	+
Access for any users to the panel managements of the application		+	+
Display information about actions and discounts on goods in the application		+	+
Possibility of preliminary loading of models and information about goods for work in offline		+	+
Photo and video of 360 degrees		+	+
Fast comparison of goods according to features			+

Source: author

Thus, for the minimum amount of functions the price will be 5000 rubles. If a shop wants to get the all range of functions the price will be contractual.

4.3.3 Place

The proposed mobile application “ScanSell” is based on Android OS so it will be distributed through Google Play. Android OS is the most popular and convenient among population both in Russia and in the world, according to the chapter 3.1.9. And Google Play is much cheaper for launching a mobile application (only one-time \$25 registration for a Google Play Developer Console Account) and the number of available applications and downloads are more than in Apple Store, according to the chapter 3.1.15.

4.3.4 Promotion

The main tools for online advertising will include search engine optimization, such as Google Adwords, Advertising campaigns in Facebook, promotional articles on websites, forums and banner advertising. A fairly new, and effective form of promotion is also a product placement in Instagram and a YouTube video.

Among instruments of subscribers monitoring for the mobile application it would be better to use YouScan, which traces references of the product in social media, and Google Analytics for monitoring actions of the users. These tasks can improve the work of the project and estimate the preferences of consumers.

Naturally, it is important to set up a website and social networking profiles for a new product as well. To raise awareness among people who do not use social networks or visit Internet sites, it is planned to attend various information festivals, exhibitions and distribute promotional materials.

The way of communication with potential customers should be cleared, short and complete. This should be taken in mind, which the sales process does not end with downloading. It is designed to customize support, create instruction material and be ready for consumer feedback. All this can help to improve the application and build long-term relationships with customers.

4.4 Situational analysis

The situational analysis of the proposed mobile application was conducted in order to realistically explore both internal and external environment, challenges, opportunities and threats that would possibly affect author’s potential project.

4.4.1 PEST

The mobile industry and the mobile applications market are both at the arising stage. Everything in this industry is in network or mobile phones.

Political factors

One of the main current negative factors is political uncertainty. The continuing crisis in Ukraine strengthens negative moods, and further cooling of the relations between Russia and the West undermines investor confidence. Deepening of the Russian-Ukrainian conflict will increase geopolitical risks, and uncertainty can amplify at the expense of further sanctions and reciprocal actions of Russia. It will increase volatility of the market and will make the prospects of restoration even more elusive.

Another negative factor is that Roskomnadzor has blocked LinkedIn in 2016. LinkedIn is the largest business social network in the world which at the moment totals 467 million registered users. The ban is explained by the fact that the company has refused to execute the requirement about localization of bases with personal data of the Russian citizens in the territory of the Russian Federation, having confirmed thus the disinterest in work in the Russian market (Roskomnadzor, 2017). Because of blocking of LinkedIn ease of receiving finance, simple credits and attraction of investments, including foreign, in the Russian business was sharply reduced.

It should be noted that together with new negative factors there were also some factors contributing to the development of the Russian market.

In November, 2013 the Government of the Russian Federation has approved the Development strategy of branch of information technologies in the Russian Federation for 2014-2020 and on prospect till 2025. According to the accepted strategy as the key directions of development of branch are defined: development of personnel potential and education in branch; formation of scientific base on perspective researches in IT; support of small business in the field of IT; IT export development; expansion of use of IT in domestic economy; providing infrastructure due to further development of broadband Internet access (IDC, 2014).

New opportunities for development of the IT market in the country have arisen thanks to development of cooperation with China and also creation in 2014 of the Eurasian Economic Union (EEU). Besides the largest gas contract in the history of Russia, Russia and China have signed a number of the agreements mentioning bank, space, telecommunication, transport and other branches that will stimulate modernization of IT infrastructure. EEU has begun the work since 2015 and became the largest common market in the former Soviet Union with a capacity of GDP of 2.7 trillion dollars. The Russian suppliers of IT products and services will get access to broader market and will be able to participate in joint projects in union member countries.

It is also necessary to refer the planned adoption of law on storage and processing of personal data within the country. This change of the legislation considerably will increase the need for the systems of data storage of the companies working in Russia. An important positive factor are also plans for import substitution and development of domestic IT products, including processors that will entail also considerable expenses and on IT services, especially development of the custom software, IT consulting and system integration.

Positive factor was also so far the aspiration of foreign investors to make investments in a cloud computing in Russia. The leading international producers continue to invest in IT infrastructure for rendering cloud services in Russia. IBM has invested money in construction of three data-processing centers in Moscow and one in St. Petersburg. In April, 2014 SAP announced plans for investment of 20 million dollars into construction of data-processing centers in Russia for support of the cloud services (IDC, 2014).

Economic factors

A seriously limiting factor of development of all market is weak diversification of Russian economy. According to the forecast of the European Bank for Reconstruction and Development, at the existing rates of production of energy carriers of explored reserves of oil and gas of Russia will last only for the next 20 years (IDC, 2014). Development of new fields in Eastern Siberia and the Arctic will demand big investments which can be inaccessible because of the decreasing growth rates of economy and economic sanctions. Weak diversification of economy leads to excessive dependence of the country on the energy sector and fluctuation in prices of energy carriers.

It should be noted, that the surge in inflation and increase in prices for imported production also significantly slow down development of the market, forcing the Russian and foreign businessmen to refuse ruble investments. The high rate of inflation undermines confidence of consumers and negatively affects all market.

There is a big variety of economic features in Russia (inflation, recessions, and sanctions) that allows local competitors to have exclusive positions due to deeper acquaintance to these features. Respectively, the developed economic situation in the country, has not avoided also the market of mobile developments. Many companies which are engaged in application creation have replaced activity, having begun to develop OS under the order. Startups, unfortunately, do not sustain the competition. Except financial problems, in the country the shortage of points of access to the wireless Internet and weak level of the signal is still sharply felt. And if this problem is not so relevant for the large cities, then for the periphery remains very topical. While the Internet from mobile operators still continues to remain expensive.

At the moment the main factor affecting the market of mobile applications is sharp decrease in growth rates of national economy. It involves reduction of budgets of the large companies on such kinds of activity as marketing activity, PR. Many projects planned in 2014 have got laid off.

Furthermore, different welfare of Russian citizens and different solvent demand influence financial performance. Constantly changing exchange rates and their ratios can generate competitive advantage to competitors within the country or more informed transnational competitors.

Different costs of power, communications and others in Russia and continuous changes of these indicators complicate work and provide the context for emergence of products substitutes.

Transnational economic interactions (national payment service providers, merges, partnership), and development of e-commerce promote more successful financial turn for the good of the companies.

Nevertheless, despite such economic problems in Russia, the mobile industry grew with very fast speed for last year. It is considered that growth will even increase in the next several years because of various reasons, such as increase in sale of smartphones and more use of applications. Also demand unites in the industry. Comprehensive income in the mobile application industry in 2016 has made about \$65.79 billion which as it is expected, will grow. Growth depends on the market (clients) and technical progress. The companies use the Internet and mobile phones for marketing. They create pages of social networks, advertisements in territories and digital marketing campaigns to reach clients around the world.

According to the studio of mobile development “Begemot-begemot”, the average psychological threshold of admissible cost of design and execution of applications has significantly grown from 90 000 to 250 000 rubles, and it became rather simpler to sell design of the application for 500 000-700 000 rubles (Apps4all, 2016). The average psychological threshold on complex development has generally risen from 400 000 to 800 000 rubles.

Socio-cultural factors

The social environment also changes which promotes use of applications. There is a huge switching to the mobile applications based on games, purchasing and banking. Besides, the mobile phone becomes more functional and useful tool in the life of people, than any other device. The functionality of mobile phones is increased by applications because of which the market of applications will benefit as it is believed.

Also the different level of computer literacy in Russia is felt due to lack of support of the Russian high school and profile higher education institutions, and lack of opportunities for realization by young specialists of the gained knowledge, especially in regions.

The set of languages, different language groups, abundance of dialects, a variety of cultures, and the different relation to production reflect the aspiration of many clients to communicate with representatives of the country that gives advantage to intra country competitors.

The research conducted by Rosstat in 2016 in 45 regions of Russia has revealed that 70% of Russians do not know any foreign languages. 15% of Russians are fluent in English while only 5% know German or Spanish (Rosstat, 2016). The research of the international analytical company Common Sense Advisory conducted in 2014 in a number of the countries for which English is not state (including in Russia) has shown that 87% of the consumers who are not knowing English do not buy goods and do not use services of English-language websites (Common Sense Advisory, 2014).

In Russia the level of proficiency in language is yet not so high because of a sanctions regime and reduction of cultural and humanitarian communications with the countries of the Anglo-Saxon world. But in general the country in a trend: so, women in Russia, as well as in the world, speak English better than men. Reasons a little: in most the states they are more educated, with a bigger share of probability leave secondary school, but not professional establishment, and study at the university.

Technological factors

There are various technological reasons which promote use of the mobile phone and applications. The best technology for communication in a form 3G and 4G facilitates much more the high speed of the wireless Internet. It does use of mobile trade much easier and to available. Besides, with introduction of modern hardware as tablet, personal computers of applications sale will increase even more as it is expected. But some technical progress also happens which could change a way as which the industry works. Now applications – the dependent on OS. It creates the main problem for developers to develop applications for all platforms as it increases their effort. There are no attempts made to develop the platform, such as browser which can operate the same application for any OS. If such thing was developed, then the difference between operating systems for the mobile phone would decrease to a large extent. More and more companies will do mobile applications, considering it as the integral communication channel with partners and clients.

Also inquiries on types of the developed applications were replaced with increase in professional level of clients. For example, it is noticeable less requests for clones of successful services and applications. Instead demand for creation of unique tools for management of things of the Internet, corporate applications and other specialized difficult technological decisions grows.

At the same time unequal conditions of Internet access in the territory of Russia and development of this direction complicate forecasting creation of this network.

However, the rate of technologies development in the Russian Federation allows involvement of consumers and application developers.

To sum up, then the market surely and quickly moves forward, becoming noticeable on the world card, but before leadership is still far.

4.4.2 SWOT

This chapter evaluates the strength, weaknesses, opportunities and threats of the author's proposed mobile application.

Strength

- Saves time of the shop-assistants for customer support – the main benefit of the mobile application – quickly convinces buyers in their long-term decision-making and, respectively, increases marketability of goods and the profit of a shop.
- The unique software in the market of mobile applications; any applications do not offer similar features.
- Extraordinary – the mobile application not only increase profitability of a shop, but also reduces the place demanded on goods.
- Training – the mobile application can serve as a tutor for new shop-assistants, informing on production and the company.
- Useful features – uses the scanner of a code and alternative reality for the image of goods in real time in the form of a volumetric figure.
- Strong relationship with suppliers.

Weaknesses

- The new application – since the project launching business will lack image of a brand, trust of customers and have no loyal client base.
- A high initial investment is needed – 437135.31 rubles for the proposed mobile application.
- Necessary of constant completions – the application should be tailored almost for every client (shop).
- Impossible to use in all kinds of shops.
- Thousands of mobile application developers.
- Lack of focus on a single platform.
- Developers need to be in step with the times and quickly to relearn new technologies.

Opportunities

- Government's support in growing local market.
- Moving to online shopping.
- Potential in the growing of mobile devices – growth on demand of smartphones and tablets in Russia.

- In the future, the application perhaps can replace shop-assistants because of the free version, and cut down expenses on the salary of the shop-staff. Thus, respectively, it will be the only one of its kind in the mobile application market.

Threats

- Risk of a failure and being unprofitable.
- Economic conditions – fluctuation of labor cost, set of net income and other economic factors can negatively impact business as at the moment Russia is under the influence of the sanctions regime.

- Strong threats in the market of online-shops which can force out the real analogs and which are in demand and popularity worldwide.

- Entry of competitors – the application can be easily replicated.

4.5 Software development life cycle: requirements to system and drawing a technical task

The software development life cycle of the proposed mobile application is based on agile methodology and its structure for creating of the project, according to the chapter 3.1.14. The mobile project is often subject to internal or external uncertainty, such as indistinctly certain requirements or frequent change of needs of users therefore it will plan quite reasonably its life cycle, using any agile-technique, or as it often happens in practice, their combination, for instance Scrum and XP. But first of all, it will be described only the specification (technical task) for this mobile application and its functions because of the purpose and objectives of the thesis. Today various services became strongly relevant for most of people. However still there is no resource, allowing in real time not only to help, but also to provide full information support about the chosen objects.

The application shows necessary data about product for clients to make purchase using QR-codes and augmented reality.

It is presented the information system giving the following opportunities for shop-assistants within the thesis.

Boost consumption

The application increases a customer and conversion involvement based on clients' awareness-raising in the product.

Simplification of relationships with consumers

Consumers can get all necessary information about a product in an interactive way, read reviews, and see features, photos and so on. And it is all without help of an assistant.

Economy of shopping capacity

The application allows showing photos or a real model of a product in augmented reality. It gives opportunity to display huge number of goods at a little shopping capacity.

Enhancement of operating efficiency of an assistant

Trade personnel can effectively provide all necessary information advising a product.

The information system will carry out search in Russia, but also distribution is possible on the European market.

4.5.1 Description of the mobile application's functions

Functionality of the developed system is listed below.

- Description of products' features
- Gallery of images
- Goods 3D model
- Generation of price tags on a template with markers augmented reality in the PDF format for printouts in printing house (CMYK) or on the printer
 - The name and logo of the company on price tags and markers of augmented reality, opportunity loadings of own template
 - Change of the color scheme of buttons, pages descriptions of goods
 - 3D – logo of the company when loading model of goods and a logo output on pages of goods description
- Click to the external web page of goods from application
- Viewing of a 3D model of goods with various coloring and materials
- The distributed coalition loyalty program
- Connection of web service for display additional information
- Display existence and the remains of goods in shop in real time
- Access for any users to the panel managements of the application
- Display information about actions and discounts on goods in the application

- Possibility of preliminary loading of models and information about goods for work in offline
- Photo and video of 360 degrees
- Fast comparison of goods according to features

Further it will be considered development of structure of a mobile application, namely – creation of the specification.

4.5.2 Drawing the specification of the mobile application

The specification allows participants to understand their roles.

The performer can understand a task essence, to show to the customer “technical shape” of future product, program product or the automated system. The customer should realize that it is necessary for him/her and to demand the compliance of a product to all conditions stipulated in the specification. Both parties can present a ready-made product and execute check of a product. These steps help to avoid the mistakes connected with change of requirements (at all stages and stages of creation, except for tests).

Depending on expectations of the customer, there are three alternatives for the choice of a template of the specification. If the customer demands execution of documentation according to state standard, the choice is made towards the GOST 34.602-89. This standard extends to the automated systems for automation of different types of activity (management, design, a research, etc.), including their combinations, and establishes structure, contents and rules of execution of the document “Specification on Creation (Development and Modernization) of System”. *GOST 34.602-89. Information technology. Set of standards for automated systems. Technical directions for automated system making. Resolution of the State committee of the USSR on standards from 03/24/89 No. 661 (an edition from 04/15/2004)* Preparation of the specification in accordance with GOST 34.602-89 demands considerable time expenditure.

If short deadlines of preparation of the specification are put and the customer does not demand execution of documentation according to state standard, then it is possible to use a specification template according to the IEEE STD standard 830. The IEEE STD standard 830 assumes that detailed requirements can be extensive and there is no optimum structure for all systems. For this reason, the standard recommends to provide such structuring detailed requirements which does them optimum for understanding. The standard recommends various ways of structuring detailed requirements for various classes of systems.

There is also the third alternative for the choice of a template of the specification when the customer suggests using the corporate template admitted to the companies for the description of requirements to information systems.

The developed specification has been created and has been realized according to the following plan.

Description of the project

The mobile application for shop-assistants – the application, will be the collection of functions. The application will be for private use especially for shops with large variety of goods and big size of them (e.g. household equipment, electronics, furniture, building materials and sport equipment).

Project purpose

Main objective of the project – shows necessary data about product for consumers to make purchase.

Audience of the user

The project does not limit users on sex, nationality, outlooks on life, but there are age limits as shop-assistants in Russia can be people at aged 16-55.

Localization of the project

The application will be directed to shops in Russia. In the future it can also be distributed in the foreign market.

4.6 Evaluation economic effectiveness of mobile application development

Introduction of a mobile application bears for itself reduction of the salary to the employee working as the sale-assistants in any shop.

The main objective of carrying out an economic research on introduction of a mobile application is determination of size of economic effect of launching a product.

The purpose of the carried-out calculations is definition of payback periods of the introduced system.

Calculation of this chapter is based on the Bachelor thesis of Dutova (2016) and Smirnova (2016) which are similar with this thesis in an analysis and proposal of mobile applications but for different purposes.

4.6.1 Calculation of labor input on the project

The labor input of the software product development can be broken into the main stages. According to it, the general formula of work expenses calculation in people-hours (p/h) looks as follows (1):

$$LI = LI_1 + LI_2 + LI_3 + LI_4 + LI_5 + LI_6 \text{ (p/h)} \quad (1),$$

where:

LI_1 – labor input on studying the task description (p/h);

LI_2 – labor input on development of task solution's algorithm (p/h);

LI_3 – labor input on developing flowchart of a product (p/h);

LI_4 – labor input on writing the program (p/h);

LI_5 – labor input on debugging of a program on the computer (p/h);

LI_6 – labor input on preparation of task documentation (p/h).

The making expenses of work can be defined through conditional number of operators in the software product. Their number includes those operators who the programmer needs to consider in the course of work on a task taking into account possible specifications of problem definition and improvement of an algorithm (Golovanova, 2014) (2):

$$O = o * C * (1 + \sum_{i=1}^n P) = 242 * 1.5 * (1 + (2 * 0.5)) = 726 \text{ (p/h)} \quad (2),$$

where:

o – estimated number of operators, $o = 242$;

C – coefficient of the program complexity (1...2), the author took the average meaning $C = 1.5$;

P – coefficient of the program correction at the development (0.5...1), $P = 0.5$;

n – the number of the program corrections during its development, $n = 2$.

Labor input on studying of the task description LI_1 , taking into account specification, can be determined by a formula (3):

$$LI_1 = \frac{o}{75 * K} * B = \left(\frac{726}{75 * 1.3} \right) * 3.1 = 23.08 \text{ (p/h)} \quad (3),$$

where:

B = coefficient of increase in expenses on a task complexity, $B = 3.1$. The coefficient of increase in expenses characterizes increase in expenses of work owing to insufficiently complete description of a task, specifications and some completion. This coefficient can accept values from 1.2 to 5. The author took an average value (3.1) for the most exact calculations (Golovanova, 2014);

K – the coefficient of the developer qualification, $K = 1.3$. It depends on experience of the programmer with this software product. The coefficient of qualification accepts discrete values depending on an experience:

- a) up to two years of $K=0.8$;
- b) from two to three $K=1$;
- c) from three to seven $K=1.3 \dots 1.4$;
- d) over seven years of $K=1.5 \dots 1.6$ (Golovanova, 2014).

As the minimum set of operators is provided, it will be necessary to employ the skilled developer (for reduction of costs of specifications and completion).

LI_2 – labor input on development of task solution’s algorithm (p/h) is estimated by the equation (4):

$$LI_2 = \frac{O}{20 * K} = \left(\frac{726}{20 * 1.3} \right) = 27.92 \text{ (p/h)} \quad (4),$$

LI_3 – labor input on developing flowchart of a product (p/h) is estimated by the equation (5):

$$LI_3 = \frac{O}{10 * K} = \left(\frac{726}{10 * 1.3} \right) = 55.85 \text{ (p/h)} \quad (5),$$

LI_4 – labor input on writing the program (p/h) is estimated by the equation (6):

$$LI_4 = \frac{O}{25 * K} = \left(\frac{726}{25 * 1.3} \right) = 22.34 \text{ (p/h)} \quad (6),$$

LI_5 – labor input on debugging of a program on the computer (p/h) is estimated by the equation (7):

$$LI_5 = \frac{O}{10 * K} * B = \left(\frac{726}{10 * 1.3} \right) * 3.1 = 173.12 \text{ (p/h)} \quad (7),$$

LI_6 – labor input on preparation of task documentation (p/h) consists of labor inputs on preparing materials in typescript and editing, printing and designing a manuscript. It is calculated by the equation (8);

$$LI_6 = LI_7 + LI_8, \quad (8)$$

where:

LI_7 – labor inputs on preparing materials in typescript; is calculated by the equation (9),

LI_8 – labor input on editing, printing and designing a manuscript; is calculated by the equation (10).

$$LI_7 = \frac{O}{15 * K} = \left(\frac{726}{15 * 1.3} \right) = 37.23 \text{ (p/h)} \quad (9).$$

$$LI_8 = 0.75 * LI_7 = 0.75 * 37.23 = 27.92 \text{ (p/h)} \quad (10).$$

Hence, LI_6 will be the following:

$$LI_6 = 37.5 + 28.13 = 65.15 \text{ (p/h)} \quad (8).$$

Results of calculation should be put in the Table 4.

Table 4 – Labor input work on developing a project

#	Stages of design	B	K	Calculation	Labor input (p/h)
1	LI ₁ – labor input on studying the task description	3.1	1.3	$LI_1 = \frac{O}{75 * K} * B$	23.08
2	LI ₂ – labor input on development of task solution's algorithm	3.1	1.3	$LI_2 = \frac{O}{20 * K}$	27.92
3	LI ₃ – labor input on developing flowchart of a product	3.1	1.3	$LI_3 = \frac{O}{10 * K}$	55.85
4	LI ₄ – labor input on writing the program	3.1	1.3	$LI_4 = \frac{O}{25 * K}$	22.34
5	LI ₅ – labor input on debugging of a program on the computer	3.1	1.3	$LI_5 = \frac{O}{10 * K} * B$	173.12
6	LI ₆ – labor input on preparation of task documentation	3.1	1.3	$LI_6 = LI_7 + LI_8$	65.15
7	LI ₇ – labor inputs on preparing materials in typescript	3.1	1.3	$LI_7 = \frac{O}{15 * K}$	37.23
8	LI ₈ – labor input on editing, printing and designing a manuscript	3.1	1.3	$LI_8 = 0.75 * LI_7$	27.92
	Total:				367.5

Source: (Dutova, 2016), (Smirnova, 2016), own computation

In the previous table 4, it is seen that the most laborious will be debugging of a program on the computer that makes 173.12 (p/h).

Thus, the sum of labor input on development of a project on Android is 367.5(p/h). It will be 46 (p/d).

4.6.2 Calculation of expenses and prime cost of the mobile application developing

The prime cost of the project is defined by summation of the following articles of expenses:

- material resources;
- energy resources;
- compensation of the software product's developer;
- depreciation;
- other expenses.

First of all, to determine the main cost value of the program project's staff, it is necessary to estimate the average salary of the staff per hour. So the average salary of the staff per hour can be estimated by the following equation (11):

$$O = \frac{S}{N_d * T}, \quad (11)$$

where:

S – average salary of the staff per month in Russia (Table 3);

N_d – number of working days in a month, – 20 days;

T – working time, = 8 hours.

The calculation of expenses on the main salary of the staff per hour is presented in the table 5. The average salaries of the staff were used from Russian official statistic site about average salary of workers (Rosstat, 2016).

Table 5 – Calculation of the expenses on the main salary of the staff per hour

Staff	Average salary rub/month	Average salary rub/hours
Programmer	30000	187.5
Designer	26500	165.63
Project Manager	23000	143.75
Tester	20000	125
Total		621.88

Source: Rosstat (2016), own computation

Estimation of cost value of the program project's staff can be determined by a formula (12):

$$C = O * LI * \left[\left(1 + \frac{P_1}{100} \right) * \left(1 + \frac{P_2}{100} \right) + \frac{P_3}{100} \right], \quad (12)$$

where:

O – average salary of the staff per hour, rub/h.;

LI – labor input of developing, people/h.;

P_1 – percent of additional salary;

P_2 –percent of assignments on social needs, including: social and medical insurance, fund of employment, pension fund;

P_3 – percent of overhead costs.

Work of the programmer under the terms of work is qualified as harmful.

According to the provision on compensation, surcharge for harm makes up to 10% depending on certification of a workplace. The additional wages fund – 10%. Insurance premiums – 30%.

The main salary for development of the program is determined by a formula:

$$C = 621.88 * 367.5 * \left[\left(1 + \frac{10}{100} \right) * \left(1 + \frac{30}{100} \right) + \frac{30}{100} \right] = 395,375.76 \text{ (rub.)}$$

where:

O – average salary of the staff per hour, (rub/h.) – (621.88 rub/h);

LI – labor input of developing, people/h.;

P₁ – percent of additional salary, – 10%;

P₂ – percent of assignments on social needs, including: social and medical insurance, fund of employment, pension fund, – 30%;

P₃ – percent of overhead costs, 30%.

Calculation of expenses on technical aspects of the project

For development of software it is needed the technical equipments, which are illustrated in the table 6.

Table 6 – Calculation of expenses on technical equipments

Technical equipment	Number (units)	Price (rub.)
Monitor	1	4590
System unit	1	9900
Keyboard	1	390
Mouse	1	200
Printer	1	5000
Windows 10	1	9000
Total		29080

Source: M.Video (2018), own computation

The prices on technical equipment were used from M.Video online shop. Total expenses on technical equipments for developing the project will be 29080 rubles. In the table 6 the costs for development tools such as Android Studio are not included since they are in free access (Uptodown).

Fixed assets transfer the cost to the created production in the form of depreciation charges.

Calculation of overhead costs

Overhead costs have included the expenses connected with service and the organization of production. In this case are expenses on the electric power consumed by the computer during development of the program and depreciation charges. It is estimated by the following formula (13):

$$\text{Sum of overhead costs} = \text{costs of the electric power} + \text{depreciation charges. (13)}$$

So first of all, it is necessary calculate costs of the electric power and depreciation charges.

Expenses' calculation of fixed assets' depreciation

Depreciation is a process of gradual transfer of cost of fixed assets on the made production (works, services).

Charge on the established norms of depreciation of fixed assets is called depreciation charges. Norms of depreciation charges are established as a percentage to the book (initial) value of fixed assets.

Norms of depreciation can be corrected depending on deviations from standard conditions of use of fixed assets.

The annual sum of depreciation charges can be determined on a linear way – proceeding from the initial project cost of fixed assets and norm of the depreciation estimated proceeding from useful service of this object.

Useful service is the period during which use of an object of fixed assets brings economic benefits (income) of the organization. The organization establishes useful service independently at acceptance of an object of fixed assets to account.

In this work objects belong to objects of fixed assets of subjects of depreciation (Table 6).

According to Classification of fixed assets [*About Classification of the fixed assets included in depreciation groups: resolution of the government of Rus. Federation from 1/1/2002 No. 1 (an edition from 7/6/2015).*] these objects belong to the second depreciation group (property with useful service over 2 years to 3 years inclusive). And according to OKOF treat the section: 14 3020000 “The electronic and computing equipment”. Useful service for these objects is established 3 years.

The annual norm of depreciation is determined by a formula (14):

$$N_d = 100\%/t, \quad (14)$$

where:

N_d – annual norm of depreciation;

t – time of an equipment's using (years).

So it is possible to make calculation for a formula (14): $N_d = 100/3 = 33.33\%$.

Annual expenses on depreciation (depreciation charges) are calculated by the following formula (15):

$$D_y = C * \frac{N_d}{100}, \quad (15)$$

where:

D_y – annual depreciation charges;

C – initial cost of the equipment, rub;

N_d – annual norm of depreciation, 33.33 %

$$D = 29080 * \frac{33.33}{100} = 9692.4 \text{ (rub.)}$$

And depreciation charges for the project will be estimated by the following formula (16):

$$D_p = D_y * \frac{d_p}{d_y}, \quad (16)$$

where:

D_p – depreciation charges for the project;

D_y – annual depreciation charges;

d_p – time for development of the project, (days);

d_y – days in a year.

$$D_p = 9692.4 * \frac{46}{365} = 1221.5, \quad (16)$$

So depreciation charges is estimated 1221.5 rubles.

Calculation of the electric power' cost

For implementation of the program project the electric power on the technological purposes is used and estimated by the following formula (17):

$$C_{el} = C * P * t, \quad (17)$$

where:

C_{el} – cost of the electric power;

C – cost of 1 kW/h, rub.;

P – power of technical tools, kW;

t – time of working, h.

$$C_{el} = 6.20 * 0.70 * 367.5 = 1594.95 \text{ rub.}$$

So cost of the electric power is 1594.95 rubles.

As a result overhead costs are estimated by the formula (13):

$$\text{Sum of the overhead costs} = 1221.5 + 1594.95 = 2816.45 \text{ rub.}$$

Other expenses

Costs of machine time payment when debugging the program are defined by multiplication of the actual time of the program debugging by the price of machine-hour of rent time (18):

$$E_{mt} = C_h * t, \quad (18)$$

where:

E_{mt} – costs of machine time payment;

C_h – the price of machine-hour of rent time, 30rub;

t – the actual time of the program debugging.

The actual time of the program debugging is estimated by the formula (19):

$$t = LI_4 + LI_5 + LI_6, \quad (19)$$

where:

LI_4 – labor input on writing the program;

LI_5 – labor input on debugging of a program on the computer;

LI_6 – labor input on preparation of task documentation.

$$t = 22.34 + 173.12 + 65.15 = 260.61 \text{ h.}$$

Now it is possible to calculate the costs of machine time payment using the equation (18):

$$E_{mt} = 30 * 260.61 = 7818.3 \text{ rub.}$$

Calculation of maintenance cost

Costs of the maintenance are accepted equal 5% of the computer cost and estimated by the formula (20):

$$E_{m1} = 0.05 * C, \quad (20)$$

where:

E_{m1} – costs of the maintenance;

C – initial cost of the equipment, rub.

$$E_m = 0.05 * 29080 = 1454 \text{ rub.}$$

Costs of the materials necessary for ensuring normal work of the computer make about 1% of its cost and estimated by the formula (21):

$$E_{m2} = 0.01 * C, \quad (21)$$

where:

E_{m2} – costs of the materials necessary for ensuring normal work of the computer;

C – initial cost of the equipment, rub.

$$E_{m2} = 0.01 * 29080 = 290.8 \text{ rub.}$$

So total other expenses will be calculated by the formula (22):

$$E = E_{mt} + E_{m1} + E_{m2} = 7818.3 + 1454 + 290.8 = 9563.1 \quad (22)$$

Total other expenses are 9563.1 rubles.

Costs of material resources

For working process it is necessary material resources which are illustrated in the table 7.

Table 7 – Calculation of the material resources

Material resource	Price, rub.
CD-RW	40
Additional literature	200
Stationery	60
Total	300

Source: author

Costs of the material resources are 300 rubles.

Calculation of expenses is visually presented in the table 8.

Table 8 – Calculation of expenses on developing of mobile application

Article of expenses	Summer of expenses, rub.
Average salary	395375.76
Technical equipments	29080
Overhead costs	2816.45
Material resources	300
Other expenses	9563,1
Total	437135.31

Source: author

In the analysis of the main expenses becomes obvious that the maximum expenses fall on development of the software.

Calculated on the basis of, prime cost of the final product makes 437135.31 rubles. This sum can form base for further pricing, at commercial distribution of a product. As work is intended for the special purposes, costs of her are defined by technical feasibility.

4.6.3 Determination of the possible price of the developed mobile application

It will be calculated planned profit level on condition that the percent of profitability makes 25%, according to *resolution of the Russian Federation of August 11, 1992 N 576 About state regulation of the prices and tariffs for production and services of the enterprises monopolists in 1992-1993*. Profit is calculated by a formula (23):

$$P = \frac{C_p * p}{100}, \quad (23)$$

where:

P – profit of the project;

C_p – prime cost of the project;

p – profitability of the project.

$$P = \frac{437135.31 * 25}{100} = 109283.83 \text{ rub.}$$

The price of the mobile application is equal to the sum of full prime cost and profit and is calculated by a formula (24):

$$C = C_p + P, \quad (24)$$

where:

C – cost of the mobile application;

C_p – prime cost of the project;

P – profit of the project.

$$C = 437135.31 + 109283.83 = 546419.14 \text{ rub.}$$

The VAT, the percentage of which makes 18%, according to “*The Tax Code of the Russian Federation (2nd part)*” from 8/5/2000 No. 117-FZ (an edition from 12/29/2017) Article 146. Subject to the taxation and the price of the project with the VAT are estimated by the formulas (25) and (26):

$$VAT = \frac{C * 18}{100}, \quad (25)$$

Where:

VAT – value added tax of the project;

C – cost of the mobile application.

$$VAT = \frac{546419.14 * 18}{100} = 98355.45 \text{ rub.}$$

$$C_{VAT} = VAT + C, \quad (26)$$

where:

C_{VAT} – Cost of mobile application with the VAT;

VAT – value added tax of the project;

C – cost of the project.

$$C_{VAT} = 546419.14 + 98355.45 = 644774.59 \text{ rub.}$$

Thus, the estimated cost of the mobile application for shop-assistants is 644774.59 rubles.

4.6.2 Calculation of return on investments (ROI)

Each project is needed in constant searching coefficient of investments’ profitability. It is necessary for improvement of efficiency and the correct distribution of the budget.

ROI (return on investment) – coefficient of investments’ return, profitability indicator (Slomman, 2015). It shows in a percentage ratio profitability (at value more than 100) and unprofitability (at value less than 100) the concrete sum of investments in a certain project. For calculation it is necessary the following formula (27):

$$ROI = \frac{\text{gain from investment} - \text{cost of investment}}{\text{cost of investment}} * 100\%, \quad (27)$$

where:

Gain from investment – the final profit or price of the project;

Cost of investment – all expenses or the prime cost of the developing project.

Subtracting prime cost from profit, it is got final profit that is real earnings. The attitude of final profit to investments shows in how many times the first is more than the second.

$$ROI = \frac{644774.59 - 437135.31}{437135.31} * 100\% = 47.5\%$$

Thus, ROI makes 47.5%. This means that the development of the mobile application for shop-assistants will completely pay off and make 47.5% profit from expenses.

4.6.3 Calculation of break-even-point (BEP)

Every company and firm want to get profit from providing products or services for this purpose it should be known what can happen to the profit of firm at change of the output and (or) sales of products, services, the change in price and key parameters of firm's expenses.

Break-even-point (BEP) is revenue at which profit is equal to zero or revenue capable to cover all constants and variable cost of the company (Slomman, 2015). The exit to BEP means an exit to payback of the general expenses of the company.

BEP shows with what sum which has arrived into the account of the enterprise profit begins. It helps define the minimum level of revenue below which production will not pay off and indirectly shows below what price it is impossible to fall at sales of goods.

The point of profitability allows calculating the required income which will compensate expenses of the company on commercial activity, the minimum output and product sales at which expenses will be compensated by income. For any firm such size of sales volume at which the company has the expenses equal to proceeds from sales of production is considered critical (i.e. where revenue is equal to zero) (Slomman, 2015). System decrease in this size inevitably leads firm to losses and, as a result, to bankruptcy.

BEP calculates in units of production, in monetary terms or taking into account the expected profit size. For this proposed mobile application it is necessary to determine volume of sold units to get profit and it will be estimated by the following formula (28):

$$BEP = \frac{FC}{P-VC} \quad (28)$$

Where:

FC – fixed costs,

P – price per unit of mobile application,

VC – variable costs.

$$BEP = \frac{437135.31}{5000} = 87.4 \text{ units.}$$

Thus, BEP will be 87.4 units. This means that a developed company must sell more 87.4 units of business mobile application for shops with the price 5000 rubles per unit to become profitable or to achieve desired profit.

4.7 Gantt Chart for launching mobile application

Gantt chart is a popular type of column charts (histograms) which is used for an illustration of the plan, the schedule of works on any project. It is one of projects planning methods. It is used in applications on project management.

In fact, the Gantt chart consists of the strips focused along time axis. Each strip on the chart represents a separate task as a part of the project (a type of work), its ends – the moments of the beginning and completion of work, its extent – work duration. The list of tasks serves as a vertical axis of the chart. Besides, on the chart cumulative tasks, end percent, indexes of the sequence and dependence of works can be noted (Wallace, 2012).

At the table 6 it is presented the basic plan of developing mobile application for shop-assistants. Its advantages are: there is no accurate phasing of the project implementation; many tasks are carried out at a time (Table 9).

Table 9 – The Basic plan of developing the mobile application for shop-assistants

#	Name of a task	Period	Start	End	Staff	LI	Predeccors
1	Project	46days	02.12.2018	04.13.2018			
2	Creation concept	7d	02.12.2018	02.20.2018	PManager	56h	
3	Developing specification	5d	02.21.2018	02.27.2018	PManager	40h	2
4	Making description of function	3d	02.21.2018	02.23.2018	PManager	24h	
5	Determination of time period and expenses	2d	02.26.2018	02.27.2018	PManager	16h	4
6	Engineering UI/UX	10d	02.28.2018	03.13.2018		80h	3
7	Creation prototype	8d	02.28.2018	03.09.2018	Developer	64h	
8	Making flows of all screens with functions	1d	03.12.2018	03.12.2018	PManager	8h	

9	Making links between screens	1d	03.13.2018	03.13.2018	PManager	8h	8
10	Designing	8d	03.14.2018	03.23.2018		64h	6
11	Detailed study and drawing of all screens	8d	03.14.2018	03.23.2018	Designer	64h	
12	Development	10d	03.26.2018	04.06.2018		80h	9
13	Developing the 1 st version	10d	03.26.2018	04.06.2018	Developer	80h	
14	Testing	9d	03.26.2018	04.05.2018		72h	12
15	Formation the list of all defects and mistakes in functionality of the application	7d	03.26.2018	04.03.2018	Tester	56h	
16	Determination terms on completion	2d	04.04.2018	04.05.2018	PManager	16h	
17	Debugging	5d	04.06.2018	04.12.2018	Developer	40h	14
18	Launching in Google Play	1d	04.13.2018	04.13.2018	PManager	8h	17

Source: author

The development of the mobile application for shop-assistants will take 46 days and will include 18 tasks as it is shown in the table 9.

For drawing Gantt Chart, Resources Chart and PERT Chart the author used the program GanttProject. This program allowed illustrating the duration of the tasks and their connection in Picture 2 – Gantt Chart of developing mobile application for shop-assistants in Appendix.

At the Picture 3 in Appendix it is illustrated the resources chart of developing mobile application for shop-assistants in which is shown the staff of the project and their load during the development of the project (Picture 3).

As it is seen in red lines (Picture 3) a project manager of the mobile application will be loaded with work on the project much more than others employees. It can be explained by the set of tasks which must be done only by project manager.

The used approach does not mean accurate phasing of the project implementation and, as a rule, there is no large number of documentation. According to it, after emergence of need to bring changes into development, at realization it is not required to collect new requirements and

to create a new prototype according to the new specification. The designer will enough adapt the project under the evolved restrictions, and the developer will change the existing code because of new design and rules.

Program (Project) Evaluation and Review Technique (PERT) – a method of assessment and the analysis of projects which are used in project management (Punmia, 2005).

PERT is intended for very large-scale, single, difficult, not routine projects. The method means uncertainty existence, giving the chance to develop an operating schedule of the project without exact knowledge of details and necessary time for all its components (Punmia, 2005).

PERT has been developed mainly for simplification of planning on paper and drawing up schedules of big and difficult projects. The method, in particular, is aimed at the analysis of time which is required for performance of each separate task and also definition of the minimum necessary time for implementation of all projects.

The PERT Chart of developing mobile application for shop-assistants (Appendix, Picture 4) also shows the connection of the tasks and their sequence in the developing of the mobile application. The main objectives of development are designated by red color, and blue – their subtasks.

5 Results and discussions

The analytical part was mainly based on qualitative method research and secondary data from the official statistics sites and knowledge gained from the literature review which helped to conduct market research of mobile applications in the Russian Federation.

So after detailed research of aspects connected with the Russian market of mobile devices, mobile application and the Internet coverage it became possible to answer the research questions.

1. In which way is Russian mobile application market developing?

The Russian mobile market is rather young, with set of undeveloped segments. At the same time it shows the stable dynamics of growth which is maintained by the rapid distribution of the mobile Internet and mobile devices.

2. How can a mobile application be useful for shop-assistants and owners of brick-and-mortar shops in the Russian market?

A business mobile application will help shop-assistants to effectively provide all necessary information advising a product, reduce time on customer service and increase sales and profit in a shop. The mobile application can minimize the shortcomings of shops, such as when it is impossible to find the free selling assistant; the first consultant appears “not from exact department” and search begins anew; the employee “works only a week” and does not know goods at all; the seller should run on a warehouse to specify existence of the necessary model; despite existence of several cash desks, only one works in the hall because other cashiers in parallel carry out duties of consultants.

3. What functions are necessary in mobile applications for shop-assistants?

Reader of QR-codes, augmented reality, description of products’ features, gallery of images, 3D model of goods with color palette, range of goods in warehouse, video and generation of price tags on a template with markers augmented reality in the PDF format for printouts in printing house (CMYK) or on the printer are the basic functions which are necessary in mobile application for shop-assistants.

4. What key factors influence development of mobile applications?

The growing number of mobile devices, fast development of networks 4G, the general shift of consumer, communication habits towards mobility (e.g. mobile shopping, development of mobile bank service and mobile payment service providers, the growing popularity of location-based services, distribution of mobile social networks and mobile messengers) are the key factors of the growth of the Russian mobile applications market.

5. Is it worth to invest in a business mobile application for shop-assistants in the Russian Federation?

Yes, without any doubt. It is worth to invest in a business mobile application for shop-assistants in the Russian Federation. The Figures speak for themselves and prove that the Russian mobile market will constantly grow in technical sphere and demand on such application will also increase as the majority of population prefers to buy goods in shops communicating with shop-assistants in real time and trying to spend not so much time on it.

6. What is the growth of Russian mobile application market?

Increase in influence of mobile social networks, appearance of the new mobile Windows platform 8, growth of penetration of tablet computers, development of mobile payment service providers and mobile banking, reduction in cost of communication via mobile devices, penetration of LTE and its positive influence on the market of mobile applications, electronic commerce as the driver of growth of mobile consuming are the drivers of the Russian mobile applications market' growth.

Among barriers of growth of the mobile applications market the author marks complexity of payment for emerging markets and small awareness of users on opportunities of mobile applications which negatively impact the growth in this sphere.

The market segmentation section of the analytical part allowed author to clearly identify the potential target audience, whether there would be a demand for proposed product and it helped to specify the characteristics of consumers who might be interested in the proposed application. It was shown that the three biggest studios are, REDMADROBOT, Touch Instinct and e-Legion, the optimum contractor on applications programming on various platforms (iOS, Android, Windows Phone, native formats and so forth) for a great number of customers in Russia and abroad. It was estimated that the largest target group is shops with high variety of products or large size goods (namely household appliances, electronics, furniture, building materials, and sport equipment) and shop-assistants between 16 and 55 years of age. It also demonstrated that the vast majority of customers do not like to make purchase online because of the lack of trust to such stores and quality offered production. The segmentation was particularly helpful in later formulation of the marketing mix strategy.

The marketing mix made use of McCarthy's approach and the 4P's were established in compliance with the results of conducted research. The product interface and functions of the mobile application "ScanSell" were based on benefits of shops from this proposed mobile application and was compared with the mobilization program of M.Video's shop. The benefit of "ScanSell" over the competitor is that it is a business mobile application which is much easier in use, not just an operating system, and it is using augmented reality, QR-code, 3D modes of the

products and showing video which are the new high-tech industries. So it is possible to say that “ScanSell” is a cutting edge business mobile application for shop-assistants which does not have the analogs in the market.

The pricing strategy was based on competitive actual price and features and it was suggested 5000 rubles for the basic functions of the mobile application. The place and convenience to buy was derived from the share of users’ preferences in Russia and was chosen Android operating system, therefore author opted for Google Play Store as the most appropriate distribution channel. The way of promotion and customer communication is primarily based on online marketing tools and exhibitions because the market research proved that the majority of people use Internet and social media.

The situational analysis consisted of SWOT and PEST analyses that were helpful in assessing the internal and external environment of the potential business. The PEST analysis revealed possible risks due to political and legal changes because of sanctions period, the need for constant technological improvement but it also exposed the potential in growing market with mobile devices and mobile applications. The SWOT analysis uncovered additional external factors, but also allowed author to review the internal strengths and weaknesses of the business as well. The strengths were evaluated to be in unique software in mobile market, time saving application for customer service increasing marketability of goods and the profit of shops and the fact that it can serve as an educational tool for new shop-assistants. There is only little competition in mobile application market. The biggest weaknesses are high initial costs for creation of the mobile application, need for constant research and development, and the lack of brand image, inexperienced management and suiting not all shops.

The last section of the analytical part is the financial plan. The plan showed the redistribution of finances needed for initial and long-term expenditures and incorporated the rate of return and point of profitability. As it was expected, the highest expenditures will be in the first year, mainly due to high initial costs of application development 644774.59 rubles. The ROI showed 47.5% profitability of the developed project that approved that the proposed project would completely be paid off. And a creating studio is able to get profit after selling more 87 units of the mobile application for shops.

It will take 328 people/hours or 46 days for developing and launching the business mobile applications for shop-assistants which was completely illustrated in Gantt Chart.

6 Conclusion

The main objective of the diploma thesis was to analyze the current market of mobile application for businesses in the Russian Federation, its perspectives for future and propose useful mobile application for shop-assistants in Russia. The practical goals were to characterize the proposed mobile application and its functions, to describe the principles of its works and create financial plan for the potential project.

The mobile application and the theory were described in the literature review part of the thesis. The practical part was focused on development of market analysis, designing the specification and financial pan for the proposed mobile application. The market analysis was conducted with the use of secondary data which allowed the potential project identify its target audience, discover that there would be a demand for this application and it enabled to propose a marketing mix strategy to the mobile application.

The situational analyses (SWOT, PEST) were helpful in evaluated the marketing perspectives of internal and external business environment and defined some of the potential risks and opportunities the proposed business mobile application could possibly face.

Functions of intended application were designed with combination of e-commerce features. The last chapter of the analytical part, the financial plan, represented predicted expenses and price both for the developed project and for shops, also showed the future profit and economic return of the business implementation.

Based on the results, it is possible to formulate recommendations on entering the Russian market.

For success in the Russian market the application has to be adapted and localized as the prevailing most of Russians ignores English-language applications. The Russian business partner can render the invaluable help in localization and creation of marketing strategy.

The Russian social networks give such opportunities for powerful advance as advertizing in news feeds, virus content in publics and groups of users and also the share buttons in applications. Publications of reviews on local websites can give jump of popularity, however in addition to it carrying out a constant of advertizing campaign is necessary. In alternative shops of the Android-applications the competition is less, and they give to the application more chances to be noticed.

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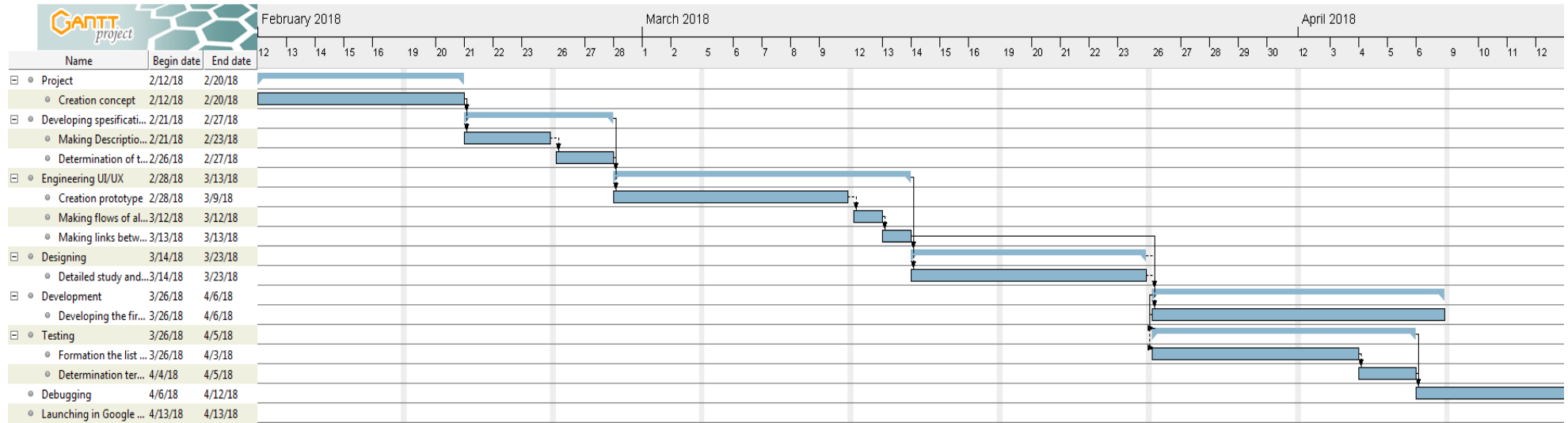
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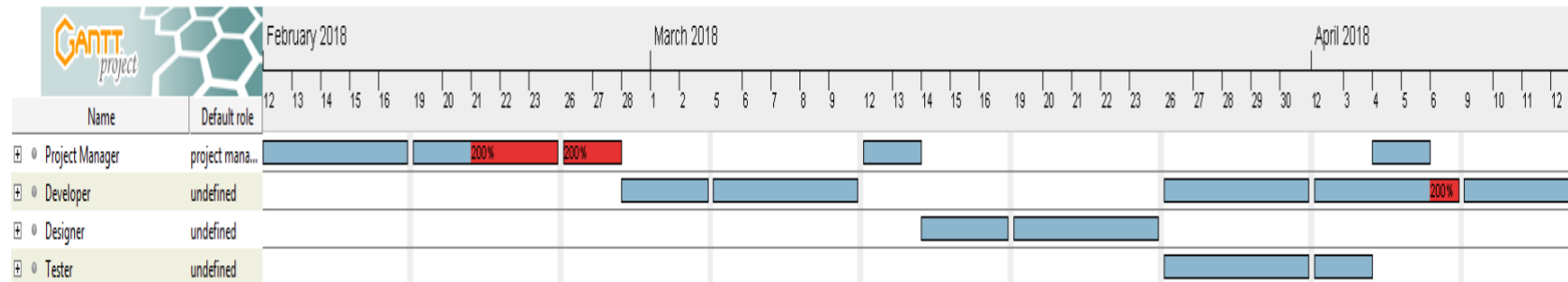
8 Appendix 1

Picture 2 – Gantt Chart of developing the mobile application for shop-assistants



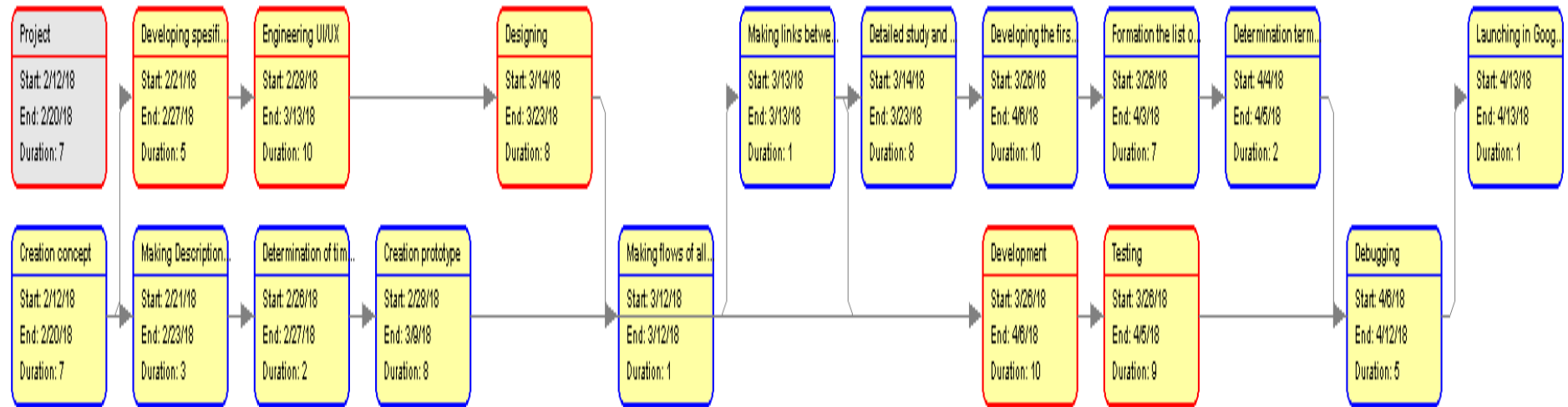
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Picture 3 – Recourse Chart of developing the mobile application for shop-assistants



Source: author

Picture 4 – PERT Chart of developing the mobile application for shop-assistants



Source: author

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