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MOBILE APPLICATION DEVELOPMENT TAKING INTO ACCOUNT THE DEVELOPMENT OF MOBILE COMMERCE

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Abstract

The high tempo of life and a dynamically developing environment make people plan their time and use modern technologies for a more competent distribution of resources, including financial ones, in order to find time for entertainment and relaxation. Currently, the market of mobile application services is growing rapidly. But despite the fact that at the moment a huge number of diverse applications are presented on the mobile application market, applications in various fields of activity continue to appear. At the same time, there is a need to optimize their use. In this connection it can be assumed that the next stage in the development of such technologies will combine the functions of various applications in one platform with the ability to intersect data in a quick, intuitive way without switching from application to application. In the process of doing the work, it was revealed that the level of competition in the market of mobile applications is very high. But in order to remain competitive in this industry, it is necessary to clearly determine the target audience for which a mobile application will be offered. In the work there were examined existing products with which new mobile applications would have to compete in the market. The idea of creating a mobile application is not only interesting, but also attractive from a financial point of view, since it does not require large initial investments and has a relatively short payback period.

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Keywords: Mobile applications market, mobile commerce, consumer preferences.



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1. Introduction

The development of the market of mobile applications is facilitated by global mobilization. It is now much more convenient for people to use the services of a mobile phone than a computer; Geolocation, when the phone itself reads the geolocation and offers the best options for choosing various services. E-commerce can act as a driver of mobile consumption growth. Mobile commerce changes the usual consumption model, it allows you to implement the full functionality of e-commerce on a personal device. All the benefits of e-commerce are available in a handheld device, and some extremely useful features are added to them, that simplifies the process of finding products.

Recently, the development and use of mobile applications have become widespread throughout the world. Today, websites have been created to help create mobile applications (<https://habr.com>), and news agencies publish statistics on their use (App Annie, 2013; Sydow, 2013). The study of the problems of the implementation and functioning of mobile applications is carried out by scientists from around the world, among which are works of Golitsyna (2015), Gui, Zhao, and Hoyt (2019), Hermes (2015), Mukherjea (2016), Panhale (2016), Kim and Ryu (2015), de Souza and de Aquino Jr (2014), Zobova, Moreva, and Yakovleva (2017), Zubkova (2016) and others.

2. Problem Statement

Mobile App Market Forecast. According to the data provided by the company App Annie, by 2022 the market of mobile applications will reach \$ 6.3 trillion. In 2016, this figure reached \$ 1.3 trillion. The growth driver is the purchase of goods and services in hypermarkets, taxi services and travel applications, to which users “bind” cards.

Although people on average have not started downloading more applications, App Annie expects that the number of users around the world will almost double to 6.3 billion over the next 5 years, and the time spent in applications will more than double. And this will increase the money turnover in the application market, which includes in-app purchases, advertising costs and, most importantly, e-commerce.

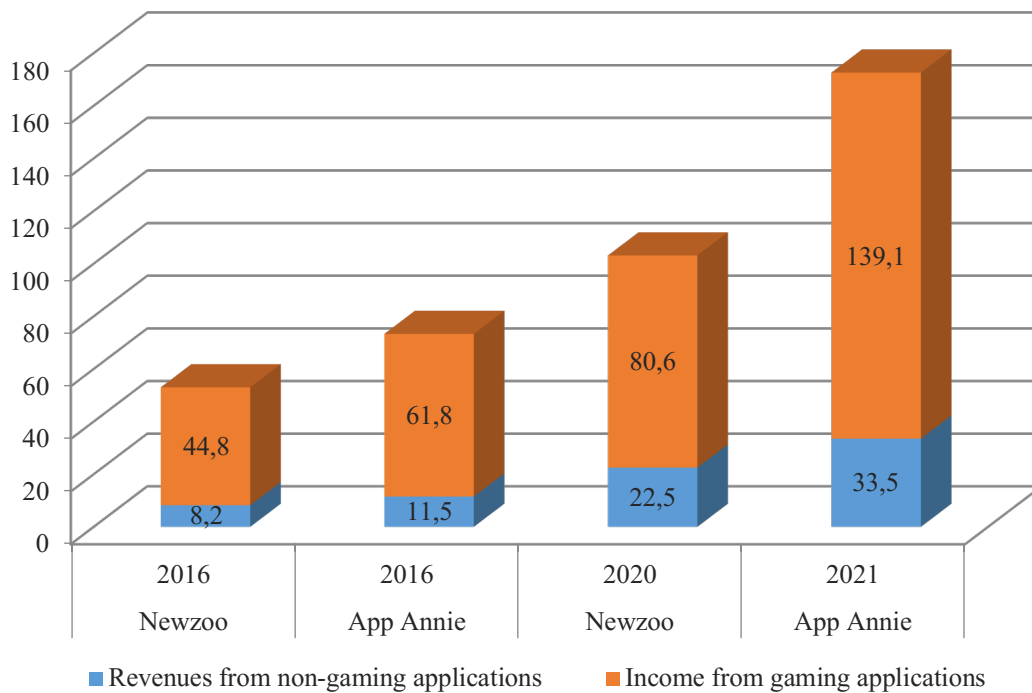
Expenses using applications will grow from \$ 379 to \$ 1.008 per person by 2021. App Annie has a huge impact on mobile commerce statistics with purchases through giants such as Amazon and Alibaba, as well as payments for Uber taxi services and travels booked through apps that contain credit information. Consumers who buy the applications themselves and make in-app purchases, along with advertising revenue, created 10% of the turnover (\$ 134 billion) of the mobile application market in 2016, and in 2021 the share of these revenues will be halved till 5%.

Thus, mobile commerce will not only become the largest part of the application market, but also show the highest annual growth rate of 39%. Payment in application markets and in their advertising will grow at a rate of 18% and 23%, respectively.

3. Research Questions

Development of the mobile application market in Russia and in the world. The market for mobile applications shows one of the highest growth rates for the market of intelligent products and therefore is attractive to investors. Rapid revenue growth in the application market is also observed (Figure 01). Market

volume of mobile applications in the world in monetary terms for the period 2009 - 2018 increased by more than 30 times, due to the expansive nature of market growth.



Source: authors based on data All Correct Group (2016).

Figure 01. Revenues from global application stores

Users spend the greatest amount of time in social applications and instant messengers. Global market research shows that about a half of the owners of mobile devices download and install additional applications (not pre-installed on the device), two-thirds of this number use applications regularly. At this stage, mobile applications are becoming increasingly popular mainly due to advertising on social networks and due to the growing popularity of mobile banking and payment systems.

In 2017, the global market for mobile applications grew by about 28-29%. Among them, \$ 65 billion came from app purchases and subscriptions, \$ 101 billion from mobile advertising and app promotion. At the end of 2016, app purchase costs are estimated at \$ 52 billion, and advertisers' expenses at \$ 77 billion. Thus, the advertisement became the driver of the market growth.

Most of the advertisement is placed in social networking applications, as well as in video services and games. The share of large brands amounted to only 12.5% of the total volume of advertisements, which reflects the characteristic difference between online advertising and mobile advertising from traditional advertising channels - small advertisers with limited budgets prevail here. According to experts, the mobile advertising market in Russia in 2016 amounted to \$ 430 million.

4. Purpose of the Study

In the light of the above said, the goal is to study the relevance of a new mobile application to optimize the interaction of a group of people spending their leisure time together. The following tasks are identified: the analysis of the market of services in the field of mobile applications; the study of the main

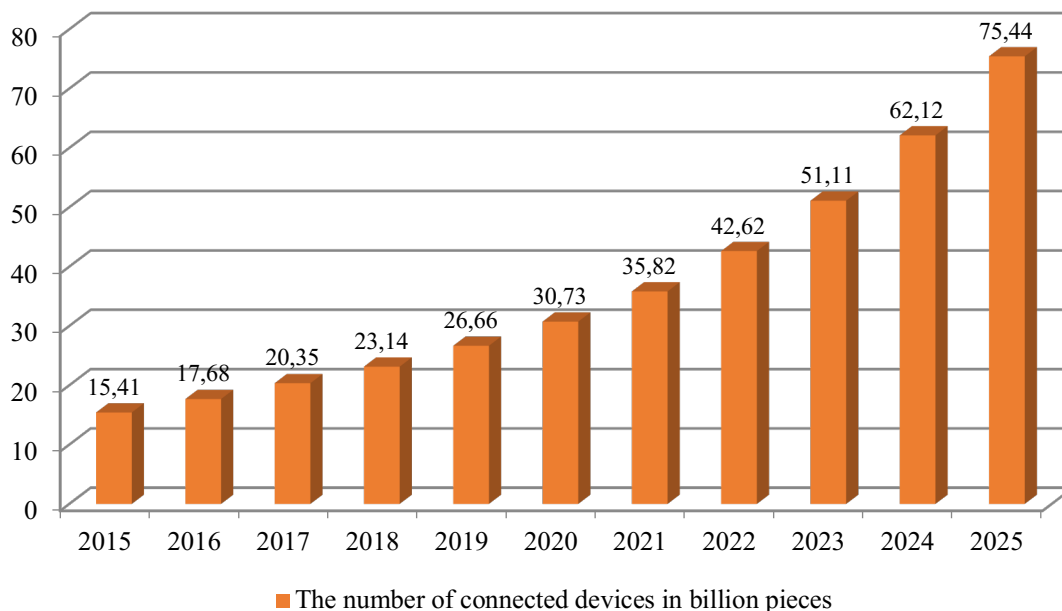
types of existing mobile applications in the field of tourism and the identification of their advantages and disadvantages, description of the idea of creating a new mobile application for a group of people resting together, and the means to market it.

5. Research Methods

The mobile application market is divided between large developers which receive about 80% of all orders, as a result, they are heavily overloaded. For example, such companies as: Yandex taxi, wats app, all maps, Google translator and many other applications that can be found on the phone of almost every user can be noted.

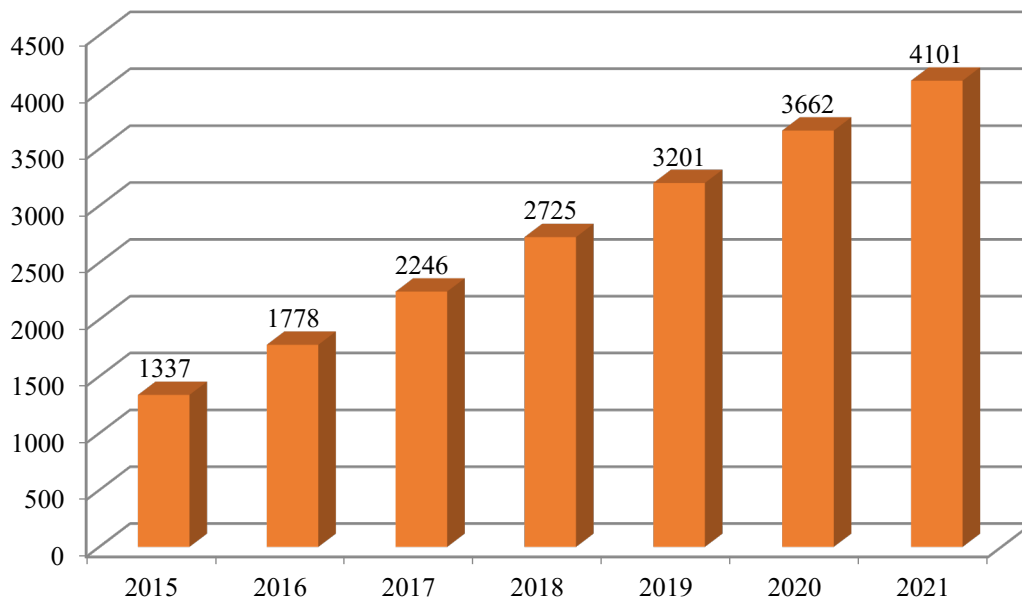
According to experts, by 2025 the number of connected devices will increase by almost 5 times and amount to 75.44 billion units (Figure 02). Such a sharp increase in the popularity of mobile applications will allow their developers and owners to receive huge amounts of income (Figure 03). The volume of revenue in 2021 will amount to \$ 4101 billion, which is three times more than the value of 2015.

All of them have the status of favorite or trusted applications, that keeps an extensive audience for a long time. It is practically impossible to compete with such companies for new market players, as the main market players not only determine the situation on the market, but also have the ability to withstand the emergence of new players in the market due to monetary and human barriers for entering into the market.



Source: authors based on Habr (2015).

Figure 02. Forecast on the number of devices connected by the principles of the Internet of devices worldwide from 2015 to 2025



Source: authors based on data All Correct Group (2016).

Figure 03. Revenue volume of the mobile fitness applications market, in billions of US dollars

The Russian mobile market is relatively young. At the same time, it shows stable growth dynamics, which is supported by the rapid spread of mobile Internet. Thus, for new developers there are many opportunities to occupy a market niche. In particular, in the West, many travel companies have their own program with prices and a list of tours, adapted to work on IOS- or Android-smartphones (Table 01).

Table 01. Mobile applications which are the most downloaded tourists

Name	What is About	Price and additional costs	Platforms	Short description
Expensify	Budget during vacations	Free, scanning of receipts - 4,99 \$ a month	IOS, Android	Expenses are entered manually, automatically from the linked card and by scanning receipts. App will recognize the amount and what you paid for. One thing: now it's unlikely that we will fail to notice that a significant part of the budget was spent on a certain purchase.
Budgy	Common expenses	free	IOS	When traveling with friends, it is necessary to foresee many things in advance, first of all the expenses. Who pays at the restaurant, who rents a car and at whose expense a picnic in the park - so that everything is transparent and peaceful, set up a general budget in Budgy. Make all the expenses in the application, and after the trip it will calculate who owes, how much and to whom.
AroundMe	Entertainment and leisure	free	IOS, Android	AroundMe receives location information and provides a list of bars, banks, gas stations, hospitals, hotels, cinemas, restaurants, supermarkets, theaters and taxi stands closest to the user.
Rome2Rio	Planning of	free	IOS, Android	It happens that from point A to point B you have to get through C and D. For these cases, Rome2Rio is useful - an application that draws complex routes, including

	complex routes			between countries. It will offer options on which buses go from A to B. For each segment, the approximate price and the site where you can buy tickets are indicated.
Couchsurfing	hospitality	free	IOS, Android	Couchsurfing is a social network for travellers. Homeowners invite to stay with them and do not take money for it. But couchsurfing is not only about the lack of payment, it is primarily about communication. At the hotel you will never know so much interesting and you will not feel as comfortable as visiting a local resident. An important point, if a person is left on their own at the hotel, then couchsurfing usually assumes that he spends some time with the owners and agrees with them on his schedule.
Booking.com		free	IOS, Android	Booking.com is a mobile version of the hotel booking website of the same name. The application has gained worldwide fame among all who love to travel the world due to its simplicity and clarity. Using the mobile application, you can select and book a hotel in any country in the world, in accordance with their requirements and desires. There are almost half a million hotels in the booking database.
Foursquare		free	IOS, Android	The application, originally created for chekins, was gradually reformatted into an excellent guide to establishments. The advantage of this application is working with geodata, with the help of which a person's location is determined and objects located nearby, starting from cafes, restaurants, shops, and ending with buildings and structures, are shown. The disadvantage of this application is the ability to work only when the Internet is connected.
Tripadvisor		free	IOS, Android	The most popular service for finding attractions in your pocket. If you have free time during your trip, with Tripadvisor you can quickly find entertainment or a restaurant by searching filters and reviews of other travelers.
Yelp		free	IOS, Android	An application for searching and viewing reviews of restaurants and cafes, shops, hairdressers, etc.
Tips by locals		free	IOS, Android	The application is especially for those who are not much interested in popular tourist places, which are written about in each guidebook. Tips by locals has collected descriptions of places dearly beloved by the locals.
Field Trip		free	IOS, Android	It helps to explore an unfamiliar city with the help of notifications with interesting information about the place near which you are. The display of these prompts can be customized to your preference.
LocalEats		charge – 75 Rub	IOS, Android	An application that focuses on working with exceptionally outstanding restaurants, also excluding chain establishments. Only the best steakhouses, pizzerias, sushi restaurants, etc. are listed in the database.
Redigo		free	IOS, Android	An application for viewing attractions on a selected route. It contains information only about the most popular places, a basic phrasebook in 7 languages, 25 offline city maps.
Афиша-Мир		free	IOS, Android	A travel application with the ability to add new addresses and notes directly from your phone. All

				information about the selected location is available without an internet connection.
Foursquare		free	IOS, Android	The application helps to search for interesting cafes and restaurants in accordance with their preferences, remembers search queries and helps to make a list of places that might interest the user.
Tripso		free	IOS, Android	The application helps to make a route in a completely unfamiliar city. The application database is quite large, so it can offer places (including offline), which are not in other similar applications.
Guidepal		free	IOS, Android	An application for creating routes and viewing information about attractions. The application database is based only on recognized and widely known guides and expert opinions.
Viator Tours & Activities		free	IOS, Android	Applications for searching and booking tours. There is an interactive map on which you can mark the selected entertainment.

Source: authors.

However, in Russia, where more than two-thirds of mobile devices run on Android, whose popularity is steadily growing, such programs for the development of the tourism sector are not observed. Based on this, we can conclude that in creating your own application development business you should focus on unfilled market niches that small companies can freely enter. This is due to the fact that due to the lack of opportunities, resources and audience, small companies cannot create an application that does not need to be supplemented and modernized, that ensures healthy competition.

The applications presented in table 01 are free or imply a single donation not exceeding 100 Rub. This is due to the fact that the profit is mainly generated through advertising, which is a lot in applications, but looks as harmonious as possible.

As a rule, successful applications include several basic functions: firstly, geo-targeting, it allows users not to waste time filling out information about the place where the user is located. Secondly, working offline, as it's not always during while traveling, the user has constant availability of communication, and failure to work without a network greatly obscures the impression of use. Thirdly, an intuitive interface, most users will not understand the application for more than 20 minutes. Fourthly, the presence of shares and additional benefits for the consumer.

Of course, these are not all factors affecting the success of the application, many non-significant factors can scare away an anxious client. For example, such as the amount of memory used, the availability, the number of foreign languages and the quality of their presentation, the relevance of the information and its structure, the availability of user ratings and much more.

6. Findings

Description of the idea of creating a mobile application for people spending free time in a group. The target of the application is to create a social network, which main objective is the full support and organization of the proposed team profiles.

Thanks to information about the group's content, budget, time spent together, age and minimum preferences, the following problems and difficulties can be solved: organization of a collective trip,

calculation and recording of events with expenditure statistics throughout its duration, maintaining the budget of colleagues at work, students, sports section or a friendly company, the selection of a varied entertainment program.

Release of the application is a difficult task, which involves registering a developer account in the AppStore and Google Play, distributing the application to potential customers for testing, hosting services, regular updates, fixing minor bugs, constantly monitoring work, adapting to new digital technologies and products. At the same time, one of the biggest problems is the constant maintenance of the application, maintaining its health and productivity.

According to a study by Distimo (McIlroy, Ali, & Hassan, 2016), most developers of mobile applications in the AppStore and Google Play have experience in development and some experience in this field, and only 2-3% of the most popular developers in the AppStore and Google Play are newcomers, which confirms the difficulties in creating a really worthwhile, useful and exclusive application for a new member. The average development time of the first version of a mobile application for a particular platform is an average of 18 weeks.

For the success of a mobile application on the market, it must fulfill its fundamental functions. Firstly, it is important to have clear application navigation, the application interface should be simple and contain a basic structure that will be understandable to absolutely any user. Secondly, the ability to determine the location when you turn on the geolocation that determines the location of a person; the application will provide him with the necessary information about hotels, restaurants, places of entertainment that are located nearby. Thirdly, the most important application should include a function for a joint trip of a company of several people, which consists in calculating the total budget of the company, the total and separate costs through the general payment system. This function will allow you to quickly pay the total bill in any institution and calculate the share of each of the total costs.

On average, 13,000 users are sufficient for the success of the application, which is relatively small by the standards of the application market. Therefore, it is important to determine the target audience, since the number of active users of the application depends on this. The target audience of the proposed mobile application are young people with an average income, such as students.

The best explanation of the principles and functions of the application will be a direct case from life. Therefore, the easiest, cheapest and most understandable way to attract users is to conduct a contest among young people, consisting of testing the application on video by a participant. The winner receives a trip as a prize.

Also, for this application, advertising using geo-targeting and selecting an audience of interest from data based on Internet requests of users, their age, gender and interests will be extremely convenient.

This feature appeared on the advertising market relatively recently, but has already shown excellent results compared to standard methods. This method of advertising will allow you to advertise the application to those who are just planning or want to travel with the company, who spend much time in a certain group of people, such as colleagues.

The main distinctive quality of the developed application is to give the team the opportunity not only to see the budget of each of the participants, but also the general one, as well as to capture basic information

about the user and his interests. Based on these data, the application offers on the map a list of places, current and budget considerations, age, gender and interests.

Next, payment for services from any of the gadgets and, as a result, a note in the statistics and a check. The key positive feature of the application is the ability to act one person on behalf of the company. For example, the work team regularly encounters the problem of collecting money for birthdays, lunches, holidays and other regular expenses of the average city resident.

For trips, the ability to select check participants is important. If the company during the trip does not go to the restaurant or the museum, but only partially, then before paying in the application it is necessary to select only the performance participants from the team and share the costs and much more. Thus, you can not only adjust the costs after payment, but also keep statistics. These functions make it possible to save time significantly, simplify the reporting team and the organization of its leisure. The application should fit harmoniously into life, of almost any age, which gives a positive forecast for the number of users, and as a result, investors.

7. Conclusion

After the study, we can conclude that the current stage of economic development, characterized by wide computerization and the widespread introduction of all kinds of technological innovations into human life, the conditions for creating and developing new mobile applications are the most successful. Users are interested in new products, competition in the Russian market of mobile applications is not high, which indicates the prospects for the development of new applications.

References

- All Correct Group (2016). 49 markets of mobile fitness applications. Retrieved from <https://www.allcorrect.ru/insights/mobile-app-market-index/?v=f9308c5d0596> Accessed: 31.12.2019
- De Souza, L. S., & de Aquino Jr, G. S. (2014). Estimating the effort of mobile application development. In D. Nagamalai, M. Wozniak (Eds.), *Proceedings of Second International Conference on Computational Science and Engineering* (pp. 45-63). New York, NY: Association for Computing Machinery. DOI: 10.5121/csit.2014.4405
- Golitsyna, A. (2015). Analysts for the first time counted the mobile advertising market in Russia. *Vedomosti*. Retrieved from <http://www.vedomosti.ru/technology/articles/2015/10/19/613401-rinok-mobilnoi-reklami>. Accessed: 31.12.2019.
- Gui, Y., Zhao, F., & Hoyt, E. (2019). Gamification in mobile application development education. In Fang X. (Ed.), *HCI 2019: HCI in Games. Lecture Notes in Computer Science, 11595* (pp. 404-413). Cham: Springer. DOI: 10.1007/978-3-030-22602-2_30
- Habr (2015). Overview of the mobile application market. Retrieved from <https://habr.com/en/post/291238/> Accessed: 31.12.2019.
- Hermes, D. (2015). *Xamarin mobile application development*. Berkeley, C.A.: Apress. DOI: 10.1007/978-1-4842-0214-2
- Kim, S., & Ryu, M. H. (2015). Mobile commerce applications. In Wiley Blackwell and the International Communication Association (Eds.), *The International Encyclopedia of Digital Communication and Society* (pp. 1-8). Hoboken, N.J.: John Wiley & Sons, Ltd. DOI: 10.1002/9781187677711.wbiedcs125

- Mellroy, S., Ali, N., & Hassan, A. E. (2016). Fresh apps: An empirical study of frequently-updated mobile apps in the Google play store. *Empirical Software Engineering*, 21(3), 1346-1370. DOI: 10.1007/s10664-015-9388-2
- Mukherjea, S. (Ed.) (2016). *Mobile application development, usability, and security*. Hershey, P.A.: IGI Global. DOI: 10.4018/978-1-5225-0945-5
- Panhale, M. (2016). *Beginning hybrid mobile application development*. Berkeley, C.A.: Apress. DOI: 10.1007/978-1-4842-1314-8_1
- Sydow, L. (2013). The state of mobile in 2019 – The most important trends to know. *App Annie*. Retrieved from <https://www.appannie.com/ru/insights/market-data/the-state-of-mobile-2019/> Accessed: 31.12.2019.
- Zobova, E. V., Moreva, S. N., & Yakovleva, L. A. (2017). Specifics of market researches in tourism. *Socio-Economic Phenomena and Processes*, 12(3), 51-57. DOI: 10.20310/1819-8813-2017-12-3-51-57
- Zubkova, A. N. (2016). Features of marketing research in tourism. *Actual Problems of Economics and Management*, 2(10), 47-49.