Evaluation of selected mobile applications stores from the user's perspective

Witold Chmielarz, *University of Warsaw, witek@wz.uw.edu.pl*

Abstract

The growing popularity of the mobile solutions leads to the research different aspects of the sphere. The aim of this article is to analyze select mobile applications stores from the point of view of a user. The analysis was carried out for three the most popular stores: Google Play, App Store and Windows Phone Store. They were selected on the basis of operating systems included in mobile devices used by the customers of these stores. Efforts were made to discover the differences in the assessment of the shops by users with smartphones and tablets with working on three basic platforms currently operating systems: Android, iOS and Windows. The paper presents the results of a survey conducted on students and teaching staff, users of the services of mentioned stores. The paper covers the presentation of the assumptions of the study and research questions, the description of methodology, the analysis of the obtained findings and discussion. In the study, which is of qualitative character, the author analyzed the opinions of a sample of university students to evaluate the selected characteristics of mobile application websites by means of a standardized scoring method.

Keywords: mobile applications stores, comparison analysis

Introduction

The main aim of the study is to analyze and compare selected stores providing the mobile application for mobile devices. The subject of the study covers: on the one hand, quality of the selected mobile application stores; on the other − users requirements and expectations, both in terms of the operating system. This type of analysis is mainly used to:

- specification and accurate research into the area in which the software works,
- creating a ranking of IT solutions existing on the market,
- identification of the features which make particular solutions better than others.

The distribution market of mobile applications is still new and it is developing dynamically from year to year. So, it means that the analysis of before the last year or two years may be completely outdated (see Billi M., Burzagli L., Catarci T., Santucci G., Bertini E., Francesco Gabbanini F., Palchetti E. 2010, Cuadrado, F., Dueñas, J.C. 2012). And development strategies of the market are still unspecified, and the final size and scope of their use remain unknown, despite of the previously made studies.

The Internet and mobile telephony are still regarded as new technology (with market penetration exceeding 147% (http://gsmonline.pl 2014) which changed the business environment allowing many market participants to reach clients and communicate with them almost without any costs (Harasim J. 2004). Social networks (Kutera R., 2011), mobile operators and mobile phone manufacturers are new players in the market which control access to information about their customers through their operating systems (e.g. Apple's iOS, Google's Android, Windows) and application mobile stores (App Store, Google Play, Windows Phone Store). They gather

information concerning both customer shopping preferences and demographic data such as gender, age, interests or particular interest groups, which, in turn, determines the segmentation of the groups of products and services. In consequence, the players are most effective in offering specific goods and services to particular groups of customers and individuals.

On the basis of the latest data provided by IDC, in the second quarter of 2014 the market of smartphones increased by 25% in relation to the second quarter of last year, and the number of produced items amounted to over 335 million devices (http://www.idc.com 2014). By 2015 the connection with the Internet will be established mainly through mobile devices (King B., 2013). In 2016 more than half of the population of our planet will be using primarily smartphones with Internet access. In the majority of cases the access will be free and settled in the monthly bill (http://thenextweb.com 2012). In the next few years the sales of tablets will exceed the sales of PCs (http://techcrunch.com 2012). The dynamics of purchasing smartphones and tablets will lead to greater market penetration and better quality of the design of mobile application.

Mobile application is understood as software functioning on different platforms, designed with different programming languages used for mobile devices, mainly mobile phones, palmtops, smartphones, phablets and tablets. Considering the purpose and the method of use, we distinguish the following software: independent applications (independent and specialized, without the need to access the Internet); internet applications (mobile services); client-streaming applications (users request access to the server content via the Internet) and computer games (of all kinds).

Together with the development of mobile applications, mobile devices and operating systems, allowing for modern, easy, fast and pleasant touchscreen interface, we could observe the development of shops with mobile applications strengthening the position of the companies leading the market. According to Gartner's data, only in 2013, 102 billion mobile applications were downloaded all over the world. The same time changed the concept of mobile applications store. Most of mobile applications in major stores is collected without incurring any payments, free. So whether it is still a shop, or a website delivering free mobile software? Free software constitutes over 60% of all App Store and 80% of Google Play applications. It is estimated that in 2017 both platforms will be responsible for 90% of the total number of application downloads. The remaining part will be dominated mainly by applications for Windows system (http://www.wirtualnemedia.pl 2014).

All the above demonstrate the high potential and diversity of the dynamic mobile market. This justifies – as it seems - sufficiently the interest in the multilateral analyses of this market components, first of all mobile application stores.

Brief characteristics of selected mobile applications stores

At present, several million applications, available on mobile platforms, constitute a technologically advanced and quickly developing market with three key players, where the three largest stores constantly compete with each other. Simultaneously, a large number of applications are created for all existing platforms, which results in its specific unification.

The development of mobile applications is influenced by:
- marketing focusing on the application, rather than a platform it is designed for,

- well-known, established brands entering the market, irrelevant of the sector they operate in (including banks, Allegro, Coca Cola, Ikea etc.),
- large studios producing video games starting to invest in this market (Electronic Arts, or 2K Games),
- establishment of generally recognizable brands on mobile platforms, an example being Angry Birds, a game created for iPhone by Rovio Entertainment. At present, toys, board games or even water are sold under the franchised brand.

The mobile applications market will continue to grow. In the coming years, it will be increasingly driven by countries such as China, India or Brazil, where people will buy more and more smartphones, and, as a consequence, increasingly use online stores with mobile applications. The demand in the mobile application market is expected to maintain its relatively strong momentum as, all the time, new applications are being designed for all three platforms.

Google with its Android system quickly took the leading position and still remains at the forefront of the mobile device market. Android has become the most popular operating system thanks to being open to creating and using mobile applications and due to its high degree of flexibility in the approach to their dissemination. Hardware producers can place their vendor-specific extensions which distinguish their products in the market. Android architecture allows for using it in very advanced smartphones, and, at the same time, on very cheap and simple devices, which constitute – due to its affordability – majority of sold items. Moreover, the company constantly invests in continuous improvement of its system, its functionality, interface and security. In parallel with the development of the system, the company is trying to improve the distribution of mobile applications through Google Play store. In addition to application development, the company has developed sales of music and films. The system of communication with the user aims at improving the quality and user-friendliness of the device as well as facilitating functions of searching, downloading and purchasing of all kinds of digital content. The producer is increasing the amount of available applications. Their quality differs because some of them are created by amateurs or small producers. Another reason for such opinions is the fact that a large variety of equipment on the market entails maintaining applications for older, lower quality devices.

The advantage of Google store over its competition is the possibility of returning the purchased application within two hours after the purchase. It is a unique feature in the market: it is seen as a very user-friendly feature, and to a large extent, it helps to solve the problem of lower quality applications. If, after purchasing, clients discover that the application proves to be worse than its characteristics suggested, they can return it to the store, free of charge. A significant drawback of the system, from the point of view of the user, is the difficulty connected with the lack of possibility, on the users' part' to decide on the system privileges level which the application may use. It is available only in iOS devices, but – as the results of the survey may suggest - it would also be very useful for users of other systems.

In the ranking of the largest sellers of smartphones, Samsung with its Android-based devices takes the first place (24.9%) and Apple is currently in the second position. In the second quarter of 2014 iPhones accounted for only 11.7% of sold smartphones (http://www.idc.com 2014) . The launch of iPhone 6 with a larger screen improved the situation to a certain extent, but considering the large choice of mobile devices with Android system, there is little chance that Apple would

overcome Google's dominance in the producers' market. We must also take into consideration the fact that Apple devices are still the most expensive, and, as a result, the most profitable. The group of Apple consumers has greater purchasing power than other clients using competitive services. This is one of important factors to consider in the examination of the mobile market, as a large part of the revenue in the future will come from the sales of applications and other products purchased in App Store. Therefore, the applications designed by professionals for iOS-based devices are usually of the best quality and they are the most modern and most technologically advanced. All the above-mentioned factors influence the fact that the income from App Store is still much higher than from Google Play store. Taking into consideration the technical possibilities and users' opinions, App Store is the best and the best-equipped system selling applications. The only element which clearly stands out from the competition is the lack of a web version of mobile apps store (music and films can be downloaded via iTunes). However, the mobile version is apparently convenient enough, and Apple seems to think that they do not need the version for PCs, or, perhaps, it is the company's policy aimed at increasing the sales of smartphones in this way.

Windows Phone store was established as the last one, and this is probably the reason why their results have not been impressive so far. Firstly, it offers the most limited range of mobile applications whose quality is perceived as the lowest among competitive products. Secondly, Windows Phone system has the opinion of being a closed system, where the possibility to introduce changes is limited. The system is constantly being developed and improved, but the current rate of change seems to be still too slow for the company to catch up with their competition. Thirdly, Microsoft has long struggled with the production of hardware operating on its own system. For a long time the company was based exclusively on the sales of smartphones produced by Nokia, because other producers believed that close cooperation with Microsoft and Microsoft Phone system is not profitable enough. Currently, Microsoft took over the Nokia department responsible for the production of smartphones. The company will need to direct its own development, and, at the same time, compete with other smartphone manufacturers using their own operating systems. Such a situation does not occur in the case of Google or Apple. In order for the Windows Phone store to succeed, they need to increase their customer base and continue developing their system. A decisive market strategy, changing the image and increasing its dynamics, as well as improving the quality of production and sales of mobile applications with their own operating system may contribute to the company's future success.

The first two stores play dominant roles in the market; the third is a relatively new competitor. The potential market power of the latter arises from the fact that it is a component of Microsoft, a company which has very ambitious plans for the development of this platform. The number of available applications in App Store and in Google Play significantly exceeded one million and in November 2014 they amounted to, respectively, 1 million 380 thousand and 1 million 350 thousand of applications (http://mobirank.pl 2014). The increase of a number of applications is roughly linear for both platforms. The Microsoft store is in the third position because it entered the mobile market much later than its competition, and the growth rate of the clients' database and the amount of application sold by the store are still lower than in the case of the remaining stores (the number of applications has not exceeded 350 thousand at the time).

The assumptions of research methodology

Considering factors such as: dynamic and complex market environment, high innovativeness and competitiveness of applied solutions and the increasing quality of applications, the following questions arise:

- What characteristic features and form should a mobile application stores take in order to appear more attractive for the clients?
- What communication and payment methods do the mobile applications stores clients prefer?
- Which of the sets of attributes and functionalities appears of the mobile application stores to be most significant from the clients' perspective?

A thorough analysis of the requirements of mobile applications stores users may provide answers to the above questions. A simple analysis of statistical data presented in the previous parts of the work is insufficient in this case: we need quantitative and qualitative studies of users' preferences concerning the use of devices and applications as well as the websites which offer them. Due to research concerning the sphere of the mobile market both in the domestic (*Technologie…*, 2008), Wielki J. 2012, Chmielarz W. 2015), and foreign (Nielsen J., 2013, Nielsen J., 2014, Alshehri, F., Freeman, M. 2012, Cuadrado, F., Dueñas, J.C. 2012, and more) literature, the study has been based on the author's own approach consisting of the following research procedure:

- selection and justification of the research sample,
- identification of the most important criteria in the evaluation of mobile applications stores (established on the basis of the survey responses),
- comparative analysis of selected mobile applications stores by means of a scoring method and the analysis of the obtained findings (method see: Chmielarz W., O.Szumski, M. Zborowski 2011), in Poland in the fourth quarter of 2014,
- analysis and discussion of findings and implications of the study.

The first prototype of the list of the metrics for mobile application stores were constructed by author. Then, by discussion with selected group of students and their suggestions it was verified (some of criteria were modified, or added or rejected). It was taken from their experience of everyday use of mobile devices and their perceptions and intuitions of the quality and comfort mobile application stores utilization.

Full list of criteria (established on this basis) the same for each store are listed below:

- availability – accessible on many devices (computer, laptop or mobile devices),
- scope of sale (electronic content: music, films, e-books and/or mobile apps),
- quantity of distributed mobile applications (in thousands)
- evaluation of the quality of application mobile store - functionality; user-friendliness, intuitiveness, visualization, color scheme, text clarity, information on the users' rights and application management, information about claims and the return of purchased applications;

- convenience of application mobile store – comfort; the existence and number of application categories, the ease of use of categories (forms of product presentation), availability of content, the ease of navigation (ease of use and finding available functions); construction of the main menu (proper distribution on the website, clarity of content), the system of evaluation and comments, Polish language filtering for applications, automatic application updates,
- the desired method of payment for mobile applications – payment by means of a credit card, options of payment by debit card, payment by gift card, subscription, payment by PayPal,
- other information: the level of expenditure, the speed of transaction, affordability from the point of view of a user.

The above list was used for the preparation of a survey aimed at analyzing the usability of websites distributing mobile applications. The author analyzed the most popular mobile application stores of this kind (identified by users):

- Google Play (formerly Android Market),
- App Store (iTunes App Store),
- Windows Phone Store.

The survey was distributed in the form of electronic correspondence (by the servers of the Faculty of Management of the University of Warsaw) and directly to respondents in December 2014. The selection of the research sample was dictated by convenience: the participants of the survey were students of B.A., B.Sc., M.A. and postgraduate programs, of both full-time and part-time studies as well as administrative staff of two selected Warsaw universities (University of Warsaw and Vistula University (Akademia Finansów i Biznesu Vistula)).

The survey was filled in by 321 participants, only for the websites which they were familiar with. Among the users of smartphones with the three examined systems: 60.21% of respondents owned devices with Android system, 23.94% with iOS system and 15.85% with Windows system. Only six participants owned a smartphone with another system, and 9.7% did not have and did not use any smartphone. There were only 4.8% of people using company smartphones. Almost 73% of respondents used their smartphone for over 2 years. Among the survey participants there were 62.6% women and 37.4% men. Most people – more than 68.2% were aged 18-25 – which is typical for B.A. and B.Sc. students, mainly with secondary education (67.3%) and 16.5% aged 26-35, which is characteristic of M.A. full-time studies and part-time studies of B.A., B.Sc. and M.A. studies. 15.3% of respondents were aged 35+ (majority of B.A. and postgraduate studies or administrative staff). In the survey 8.7% of respondents marked education at B.A. level in the questionnaire, and 24% of respondents declared having higher education (postgraduate students and administrative staff). 45% of the survey participants declared originally living in cities with over 500 thousand residents, almost 15% from cities with 100-500 thousand of inhabitants, over 22% from towns with 10-100 thousand residents, nearly 3% from towns up to 10 thousand inhabitants and 15.3% from villages.

The simplicity of the survey and provided explanations did not cause any significant distortions in the responses – the author rejected only 6 surveys. There were minor difficulties in

identifying preferences in relation to payments – on average 82% of clients use only free applications

Analysis of the findings

The author has used a simple scoring method to analyze the collected data. The author applied a simplified, standardized R. Likert's (Likert R. 1932) scoring scale for the evaluation of every distinguished criterion. According to this scale each criterion has been evaluated in the following way:

- 0.00 – criterion is not being realized, the highest costs in economic criteria,
- 0.25 – criterion is realized at a minimum, sufficient level,
- 0.50 – criterion is realized at the medium level,
- 0.75 – the level of criterion realization is good,
- 1.00 – full realization of criterion, the lowest costs in economic criteria.

Each of the respondents evaluated each criterion subjectively and assigned scores using an assumed evaluation scale. Ratings were summed; divided by the number of respondents for each store and the average results were calculated, too. Then the table of percentage of shares in the maximum possible level evaluation for each criterion was established (the degree of the suitability). This table (see: Table 1) was the basis of a comparative assessment of the particular criteria characteristic for mobile applications stores.

The scoring method is being criticized for the subjectivity of its evaluations, but, simultaneously, it is believed that the wide reach of the study and the compilations and averaging of scores allow for greater objectivity of the assessments. The simplicity of the assessments results in the fact that respondents make relatively few mistakes and they are more willing to participate in the surveys than in the case of questionnaires and surveys conducted with the application of other methods. Also, the obtained results are relatively easy to interpret. Based on the author's experience, we may see that in the case of comparative analysis of websites, the results obtained by means of this method are not worse than the findings recorded with other, more sophisticated methods (AHP/ANP, Electre, Promethee and others) (Chmielarz W., O. Szumski, M. Zborowski 2011).

The analysis of accessibility shows that clients of mobile application stores, generally speaking, are aware of the availability of other kinds of digital content (some of them have not such a awareness), in addition to applications which facilitate functionality of the device or games. Nevertheless, since they, in vast majority, do not download paid applications: in almost 50% of the cases (on average in relation to all kinds of media, apart from applications – 55.44%), they are not satisfied with the services of this kind (or, as the survey suggests, they are not interested in them). The greatest number of users, for whom the matter seems to be important and fulfill their expectations (79.29% music; 55.05% films, 58.33% eBooks) use App Store services. This was probably due to the previous use of iTunes website, which was also available in the store. eBooks can be downloaded as an additional, free application. Interestingly, very convenient access to all categories of digital content in Google Play does not entail equally good opinions (on average 48.45% of users are satisfied with the access to a variety of electronic content).

Slightly better (on average, 53.65%) are the opinions of Windows Phone users.

Table 1. The degree of the suitability of particular criteria for the assessment of the quality of comparison website

Mobile Application Store	Google Play	App Store (iTunes)	Windows Phone (Spotify)	Avarage
Availibility - accesible on many devices				
Mobile device (smartphone, tablet)	92,76%	91,41%	66,41%	83,53%
Laptop, computer	56,56%	66,67%	55,47%	59,56%
Scope of sale				
Music	54,37%	79,29%	59,38%	64,35%
Films	44,95%	55,05%	46,88%	48,96%
e-Books	46,04%	58,33%	54,69%	53,02%
Mobile apps	97,54%	90,40%	66,41%	84,78%
Quantity of distributed mobile applications (in thousand)	1380	1350	350	3080,00
Evaluation of the quality				
Functionality	83,47%	86,11%	74,22%	81,27%
User-friendliness	79,51%	84,60%	67,97%	77,36%
Intuitiveness	72,13%	83,33%	64,84%	73,44%
Visualization	69,54%	84,85%	64,06%	72,82%
Color scheme	76,91%	83,33%	71,88%	77,37%
Text clarity	75,96%	67,17%	66,41%	69,84%
Information on the user's rights and application management	69,54%	68,94%	67,19%	68,55%
Information about claims and the return of purchased applications	47,54%	53,28%	58,59%	53,14%
Convenience of the mobile application store	71,82%	76,45%	66,89%	
Comfort	78,83%	89,65%	59,38%	75,95%
The existence and number of application categories	81,15%	90,15%	66,41%	79,24%
The ease of use of categories	76,09%	80,30%	39,84%	65,41%
Availability of content	74,18%	76,77%	67,19%	72,71%
The ease of navigation	76,91%	62,63%	67,97%	69,17%
The main menu	71,17%	76,77%	67,97%	71,97%
The system of evaluation and comments	60,25%	73,74%	54,69%	62,89%
Polish language filteringfor application	56,69%	58,59%	55,47%	56,92%
Automatic application updates	71,58%	73,48%	53,91%	66,33%
The desired method of payments for mobile application				

Mobile Application Store	Google Play	App Store (iTunes)	Windows Phone (Spotify)	Avarage
The level of expenditures	39,21%	48,48%	46,88%	44,86%
Credit card	27,46%	50,25%	35,94%	37,88%
Debit card	26,09%	41,16%	38,28%	35,18%
Gift card	22,54%	25,51%	29,69%	25,91%
Transfer payment	27,05%	27,53%	39,06%	31,21%
Subscribtion	25,41%	31,57%	35,94%	30,97%
PayPal	24,32%	33,33%	34,38%	30,68%
The speed of transaction	42,62%	59,60%	39,06%	47,09%
Affordability from point of view of a user	37,57%	41,92%	41,41%	40,30%

Source: the author's own work

However, they pay attention to very low quality of the offer and excessive advertising. The results for the evaluation of music content are relatively highest (on average 64.35%), which is caused by the fact that they may be downloaded directly in all conditions on the available mobile devices. Less interest in films and books is conditioned by the technical characteristics of smartphones and downloading free films and videos from illegal and legal sources (e.g. iTube).

In the evaluation of the quality of websites providing applications for particular operating systems, the functionality criterion took the first position (it fulfills 83.36% of the maximum score) in all stores. The average client of the App Store website decided that the website realizes 86.11% of the maximum score, and it is the only website exceeding the average value by almost 5%. For the sake of comparison, the clients of Google Play evaluated the functionality of the application almost three percentage points lower than the above-mentioned score, and Windows Phone by nearly twelve. The quality of the App Store website received the highest scores (on average 76.54%) in the case of most evaluated criteria. The best scores were assigned for the previously mentioned functionality and graphic design, slightly lower for user-friendliness and intuitiveness. The worst scores were given for the availability of information on claims and returns (53.28%) and text clarity (67.17%). The availability of information on claims and returns was the feature which received the lowest scores in the case of all websites (53.14%), but still over fifteen percentage points worse than the information about the user rights and application management which was the next assessed criterion. The information on claims and returns is best evaluated by Windows Phone clients, with ten percentage points more than in the case of Google Play users and five - in the case of App Store. Still, similarly to other websites, it is the feature with the lowest scores.

As far as quality is concerned, Google Play website takes the second place in the ranking (on average 71.82%). The functionality (83.47%) and user-friendliness (79.51%) in the website received the highest scores. The criterion of user-friendliness in the case of Windows Phone (67.97%) was evaluated below the average score (77.36%). Interestingly, apart from App Store, graphic design is evaluated at a very low level – on average at 66.82% (i.e. on average eighteen percentage points lower than in Google Play and Windows Phone). It is possible that users are accustomed to visualization on laptops dominated by Windows stylistics and procedures of

using traditional online stores. Text clarity in Google Play is evaluated at the highest level (75.96%) in all websites, which shows the importance of adapting to the user requirements in this regard. The good score, nearly 10% higher than in other websites, results from the company's long-term cooperation with the user.

In terms of quality, Windows Phone with the average score of 66.89% takes the last position in the ranking. Website functionality and color scheme are among the best-scoring criteria, but they were still assigned lower values than in competitive websites.

The fulfillments by the individual criteria of quality of mobile application stores in the relation to the maximum the total possible amount, expressed as a percentage of the average for all stores are presented in Fig. 1.
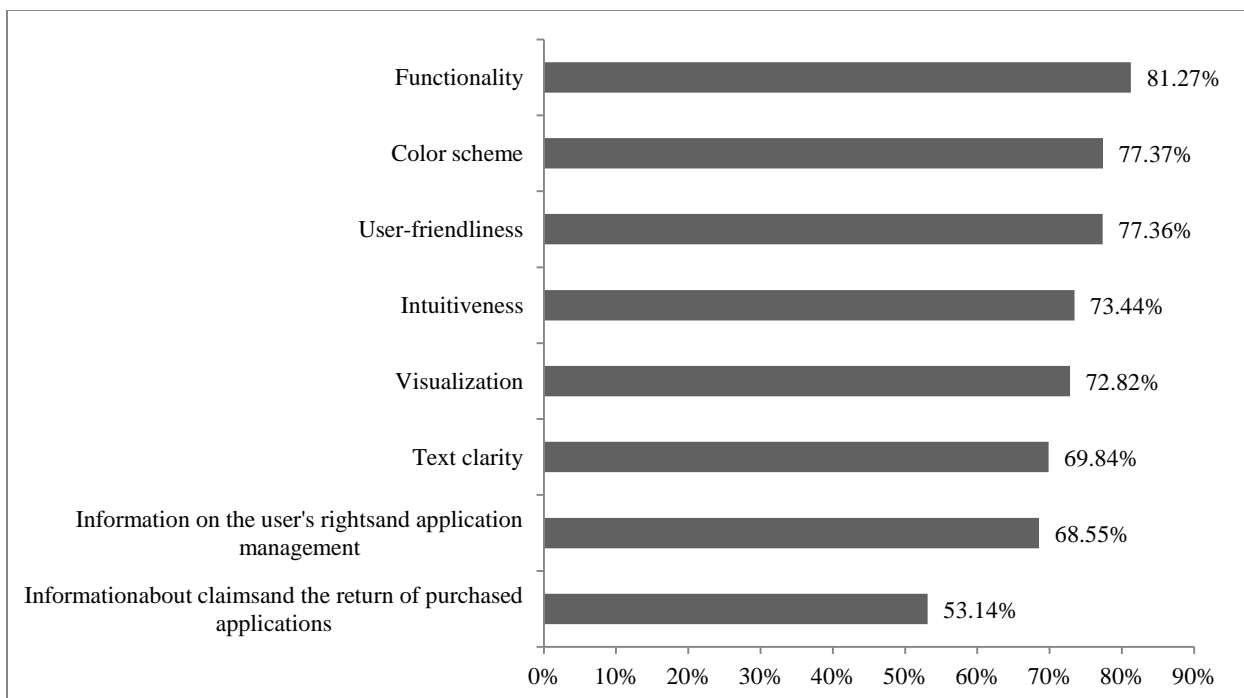

Fig. 1. The average degree of the suitability of particular criteria for the assessment of the quality of the mobile application stores analysis
Source: the author's own work

App Store (with the score of 75.79%), similarly to the previous group of indicators, takes a dominating position with regard to convenience of using a mobile application store. The difference between App Store and Google Play appears to be minimal (4%). However, the disparity between Windows Phone and App Store expands to nearly 17 percentage points. It is a substantial difference indicating a significant distance between those sites. In this group of criteria, the availability of a wide range of products (average of 82.48%) is the best perceived in all shops. The lowest score was indicated in the case of Windows Phone (66.42%), which seems understandable considering the five times lower number of the applications available in this system. The difference seems impossible to overcome taking into consideration the leader's advantage of 25% of points. App Store users assign high scores for the convenience of using the website (89.65%) and the ease of use of particular product categories (80.30%). In Google Play

the convenience of using the website is also important, similarly to the criterion of ease of navigation (both criteria about 76%). In App Store the lowest scores were given for the ease of navigation (62.63%), which is surprising considering the relatively high scores of other criteria, automatic updates of applications as well as the system of evaluation and comments (at 73%). The last criterion also receives very low scores in both other websites. The only significant feature which places Windows Phone in the leading position in this group of criteria is filtering by Polish language version. This function is best prepared in Windows Phone website, but the general quality of the function is evaluated by clients at the level of 55.47%. Such features as: content availability, ease of navigation, distribution of information and functions in the main page are relatively best rated (at 68%).

The averaged evaluations of the convenience of using the store with mobile applications and other digital contents are presented in Fig. 2.
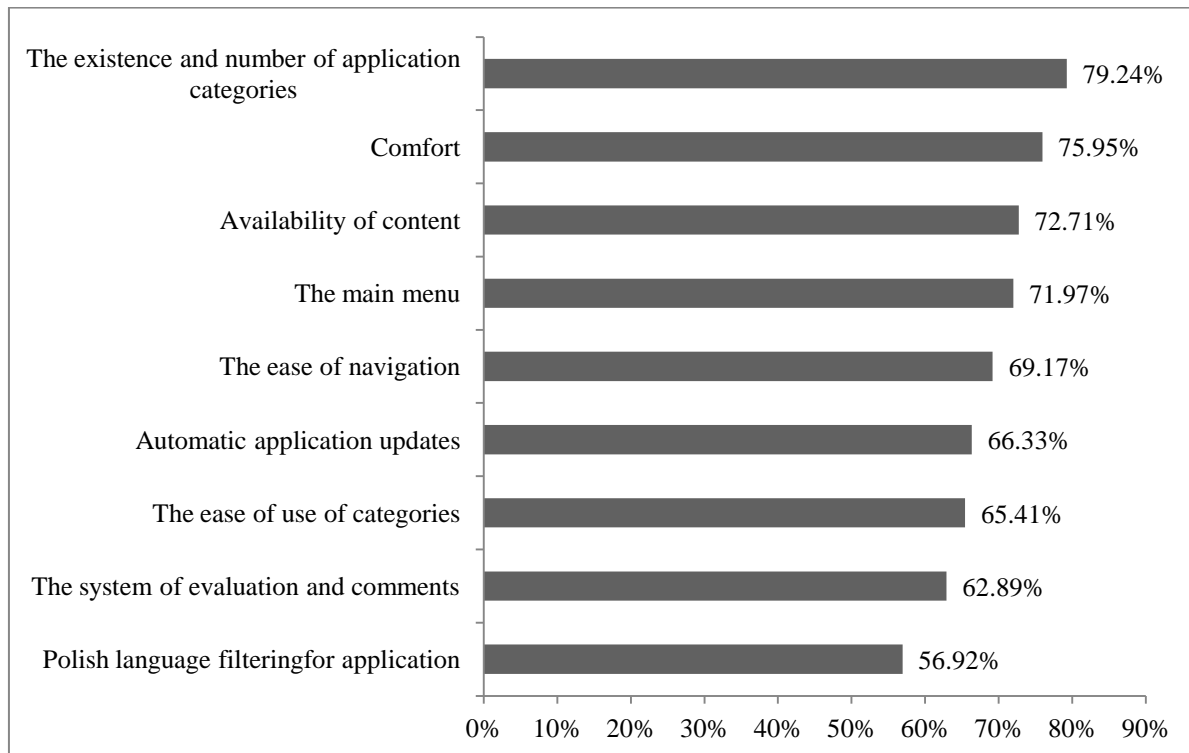

Fig. 2. The average degree of the suitability of particular criteria for the assessment of the convenience of the mobile application stores analysis.
Source: the author's own work

The greatest controversies among smartphone owners using stores with mobile applications were raised by the payments for downloaded applications. The author's previous study shows that 81.4% of users do not download any paid applications, the greatest number in the case of Android system (89.7%). In this situation the level of customer awareness concerning payments seems to be relatively low. Nevertheless, the respondents who used the services of online stores offering mobile applications were most dissatisfied with the available payment systems. Especially that not all students have their own bank accounts with a credit card. That is why there appeared suggestions to extend the payment options to

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include payment by a debit card or by transfer. Windows Phone customers assigned low scores for Pay Pal electronic payment system (38%). The options of using gift cards (on average of 26%) were limited due to their specified values (e.g. 50 zlotys, 75 zlotys and 150 zlotys).

Those who have not used paid applications so far, when asked about their preferences in the case they wanted to make payments, were keen to express their opinion, as they are accustomed to using other online stores (the experience they indicated in the survey). Among the App Store clients, payment by credit card (24%) and debit card (19.66%) enjoyed the greatest popularity. Google Play clients also indicated payment by credit card 17.96% and by transfer 17.69%. The clients of Windows Phone prefer payment by transfer (18.32%) and debit card (17.95%). Clients of all stores are most reluctant to use gift cards, emphasizing how rarely they use this particular method of payment. The structure of preferences is presented in Fig. 3.

Clients of all mobile applications stores complained about the speed of transactions (on average 47%), App Store was ranked as the best (59.60%), and Windows Phone was seen as the worst (39.06%). Users' perception of the affordability of products for sale was even worse (average of 39.33%). This criterion was best evaluated by iPhone users (41.92%), and the worst score was given to Google Play (37.57%), the shop which provided the greatest number of free applications.
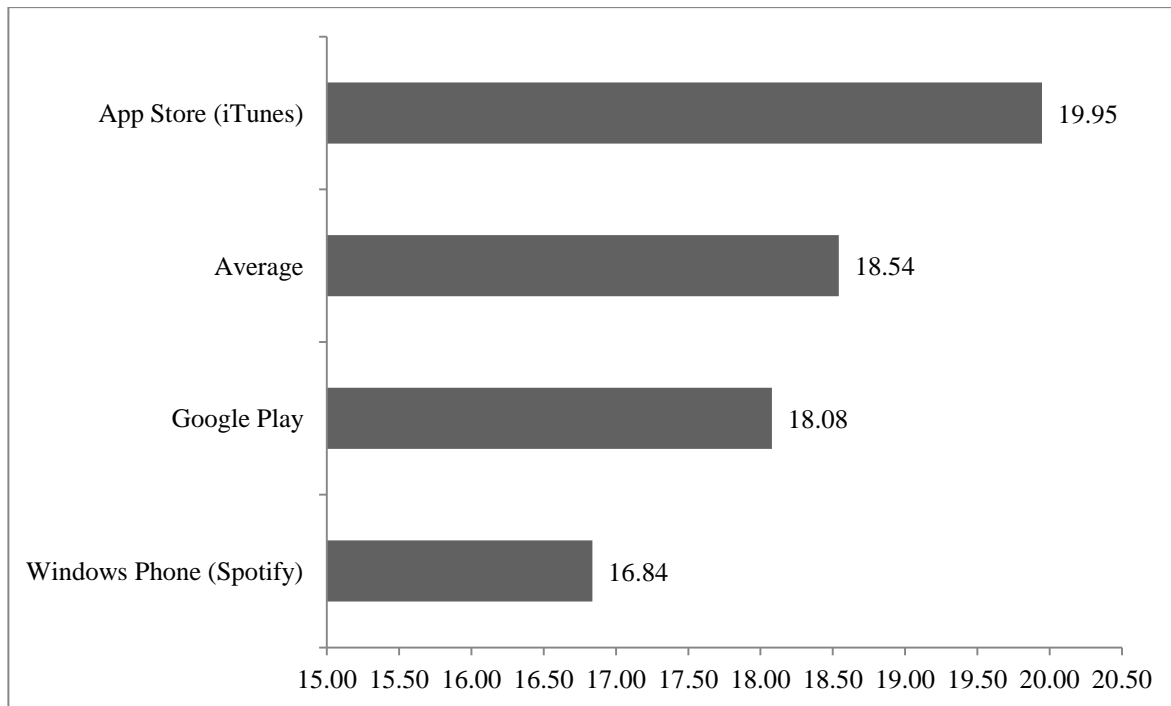

Fig. 4. Ranking of mobile application stores – (summarized points per capita for each store and average)
Source: the author's own work

Conclusions

After summarizing the results of the scoring method, the author obtained the average value for each of the mobile application store. In the users' opinions App Store ranked first with the advantage of 1.87 points over Google Play and 3.11 points over Windows Phone. The final results of the ranking are presented in Fig. 4.

The selection of the research sample and its limitations affected the obtained findings. Students are a group which owns relatively the greatest number of smartphones and use mobile applications most frequently. And know mobile application shops very well. Taking the above factors into consideration, it appears to be the best sample for carrying out the research. This group in the population also has a wide, and perhaps the greatest, knowledge concerning the newest technologies and their use. The selection of the student groups was random, the dominance of women and students of early years of study are accidental. However, it is a group which does not have considerable financial resources, and this may be the reason why the representatives of this group buy relatively few mobile applications. Also, this group has few company smartphones (which, in turn, should contribute to the increase in the number of purchases). Simultaneously, the awareness of the high usability of information technology means that this particular group is able to appreciate the practical (or entertainment) value of the offered mobile applications and games. In addition, the representatives of this group, after a few years of using smartphones and applications designed for them, are less likely to be satisfied with a product or service – in the form mobile application store for example - of lower quality.

That is probably the reason why the best scores were given to the services of App Store which offers the greatest number of professionally designed applications for sale. The sample is also the group which is more likely to experiment and reach for the latest technological solutions appearing in the market. That is why Microsoft with its store, which entered the market relatively late, stood a chance to compete with the two established companies, and the number of people using smartphones based on Windows Phone system is still increasing. Even though they may not be fully satisfied with the quality of software or convenience of mobile applications stores, still, the fact that they are accustomed to using Windows system on their laptops may affect the further increase of the company's market share.
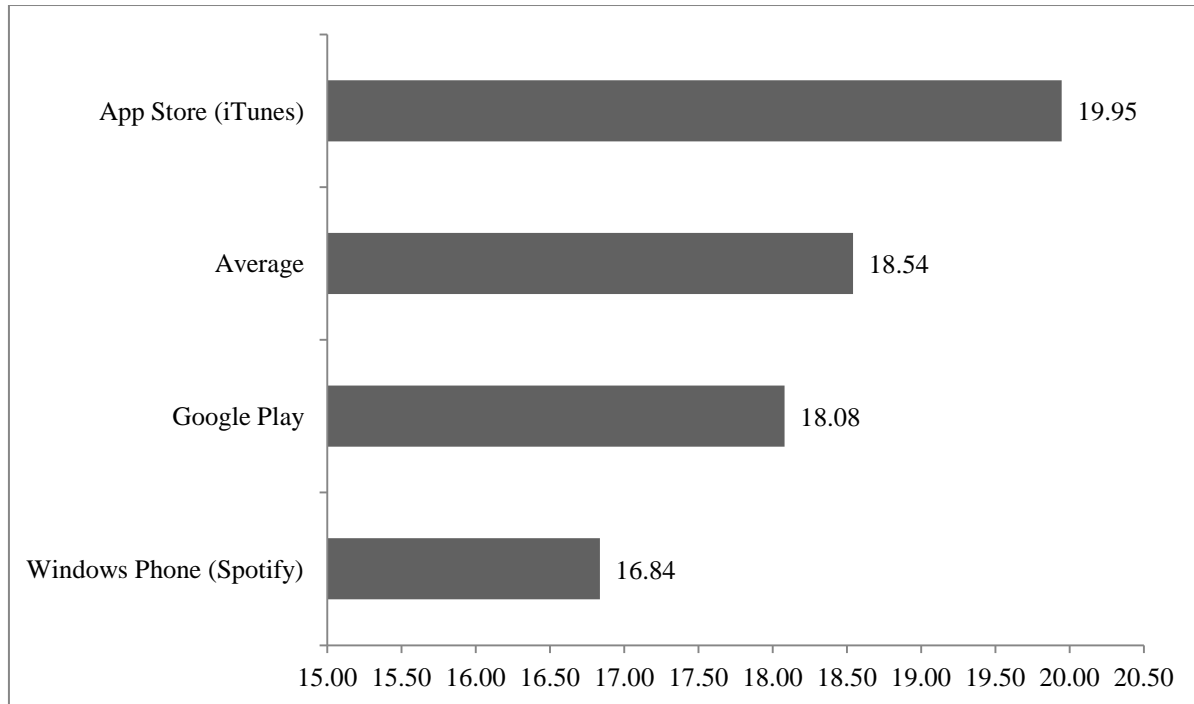
Fig. 4. Ranking of mobile application stores – (summarized points per capita for each store and average)
Source: the author's own work

Android-based devices and associated software take from Google Play Store are undoubtedly a quantitative leader in the market. The advantage of the strategy adopted by Google is customer loyalty, which entails maintenance of software used in older types of devices (available in Google Play Store). The decision may not be aimed at improving the generally perceived quality, but it has a positive effect on the number of sold items. The fact that software is based on Linux system entails a constant need to monitor the quality of the designed software created for the devices with Android system. Google Play's Store advantage in the market is simultaneously its weakness, as the high quality of the devices and applications of App Store attracts customers from the higher-priced segment. Users of all types of applications most frequently download free applications; they rarely decide to buy mobile applications – that is a real problem for all mobile application stores. One of the reasons for the reluctance to make such a purchase is, as the survey shows, deficiency in the available payment methods. Some users are not interested in downloading applications or using a smartphone in a different way than a regular phone, complaining about the fragmentation of mobile applications and the necessity to run many of them in order to use simple functions (so, it is the next problem for mobile application stores). They prefer to use a laptop in order to download digital content, other than mobile applications, due to greater convenience and the possibility of using full versions of interface and communication software. It is also caused by the fact that stores with mobile applications are not, as yet, well adapted to selling films, books and music.

The diversity of views on mobile application stores, mobile devices, their use as well as mobile applications makes it difficult to establish the general trends occurring in mobile application market. The high dynamics of changes in the market at present requires ongoing research which

would monitor the directions for its development, in particular in the field of financial services related to transactions taking place in this sector. Solving problems connected with payments in the mobile market will be the subject for further study in this area.

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Author's Biography

Prof. Doctor Witold Chmielarz is a lecturer and researcher at Faculty of Management of University of Warsaw. He studied economy at Faculty Economy of University of Warsaw, where he obtained his M.Sc. for the thesis *"Effectiveness of IT using in Polish Airlines"*. Next he worked at Institute of Systems Research of Polish Academy of Science. In 1984 he received his Ph.D. in management science from University of Warsaw for the thesis "*Information Problems of Region Economy Modeling*". From this time he worked at University of Warsaw. He completed his habilitation in 1997. His habilitation work was on "*Decision Support Systems: Model Aspect in Systems Constructing"*. He is Full Professor in economy from 2006 for the research work on *"e-Banking Systems"*. His practical experience includes three years of computer firms, as a designer, project manager and advisor. He also has consulting experience for banks and SMEs. His major research interests include e-business and project management. He has published over 150 articles, papers and books.